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Submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)

Chorus

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Executive Summary

EXECUTIVE SUMMARY

1 This submission responds to the Commission's preliminary views on the modelling choices and inputs for setting monthly and transactional TSLRIC prices for UCLL, SLU and UBA (with the UCLL price flowing through to the UCLFS service).

2 We support the Commission's views that predictability in regulatory regimes supports investment and investment promotes competition for the long term benefit of end users. To achieve these aims the Final Pricing Principle (**FPP**) processes provide the first opportunity for the Commission to look at costs and ensure the regulated price for broadband services is grounded in the reality of New Zealand's circumstances.

3 In this submission, we say:

3.1 A forward-looking TSLRIC modelling approach should reflect the efficient costs of providing regulated services in the real world New Zealand context and meet the reasonable expectations of investors.

3.2 The industry structure means that the margin for error in setting regulated copper prices is low. Chorus is a structurally separated network operator making a generational FTTH build investment. With 80% of its revenues regulated, and fibre prices capped during the regulatory period, there is nowhere for any under recovery to be absorbed.

3.3 The Commission should take care not to model a network or deployment approach that would never occur in practice. Nor should the Commission model a network that can't deliver the services that end users actually use and expect today. For example, a nationwide FTTH/FWA model and/or "super-efficient" aerial and third party asset sharing would present challenges in the real world that would need to be addressed in any modelling exercise. A material departure from reality increases the level of complexity and raises the risk of debate and legal challenge. A simpler approach would be to model a cabinetised copper network and overlay reasonable efficiencies. This would carry a lower risk of regulatory error.

3.4 Ensuring that any modelling approach is grounded in reality is consistent with the approach taken by regulators overseas. For example, in Denmark and Norway the regulator has recognised that any modelled operator displaces the incumbent network operator but inherits the same obligations to deliver the services in the market. These are not backwards looking matters but a forward-looking reality. It is also not to say that the Commission must model Chorus' actual costs – simply that any efficient modelling should be grounded in the New Zealand reality.

3.5 Determining the service to be priced first, and then determining the hypothetical network to be modelled, will help avoid the risk of modelling a network that does not deliver the services end users want and expect. This approach is also consistent with the approach taken by regulators internationally.

3.6 The UBA modelling approach, which assumes build based on Chorus' actual network, is consistent with the New Zealand reality.

3.7 We support the use of an optimised replacement cost (**ORC**) methodology for all assets optimised with a scorched node approach to value the network. This is consistent with past decisions of the Commission. A scorched node approach is also used in many European countries and in the US and Australia because of the importance of grounding the model in the real-world.

3.8 Assuming 100% demand, with no migration to other networks, fails to take account of market reality in the context of the UFB rollout and therefore under-estimates the unit cost of supplying the services. Simple economic depreciation or adjusted tilted annuity approaches can take account of demand changes.

3.9 Our expectation remains that TSLRIC modelling will set a higher aggregate UBA monthly price than the benchmarked price of $34.44. Within that aggregate price, we also continue to expect the UCLL/SLU price components to increase and expect that the UCLFS price will be higher than the UCLL/SLU price. These outcomes are consistent with the reasonable expectations of investors and the intention that entry level fibre pricing should be attractive as compared to copper.

3.10 Positively incentivising unbundling will undermine the incentives for the industry to transition to fibre, the UFB business case and future investment in non-UFB areas.

3.11 Backdating incentivises the right behaviours in this process and in the market and should be confirmed by the Commission early.

3.12 The Commission has not yet addressed the transactional charges. To ensure timeliness we propose that the Commission engage the industry now, rather than waiting for the draft determination. These charges are a fundamental part of the supply and uptake of the regulated services, and reflect the real world activity of RSPs.

3.13 The regulatory period for the final determination should provide certainty and stability to at least 2020. It would be undesirable for the industry and the Commission to continue to be focused on copper pricing resets and processes. We agree with the Commission's emphasis on the importance of predictability and respecting reasonable investor expectations in the section 18 context.

3.14 The Commission has requested modelling be provided by no later than 1 December 2014. Chorus intends to provide modelling to the Commission prior to that date to assist the Commission's work on the draft determination.

4 From a modelling perspective, this means that:

4.1 If the Commission continues down the path of a fibre MEA, a P2P approach is closest to the New Zealand reality but requires the cost of delivering the services

that end users use today (and continue to expect) to be factored in. Factoring in the cost of these "fixes" is consistent with advice from Analysis Mason and has been adopted by regulators in other jurisdictions (e.g. Sweden).[1] It is important to model a FTTN network as well, given the real world cabinetisation.

4.2 A simpler approach would be to model a copper MEA. Design and cost information is more certain and grounded in reality (while still applying the HNE TSLRIC concept). It is an approach that uses an HNE and the HNE (when assumed in the real world) can actually deliver the regulated services and the functionalities that end users experience as a result.

4.3 Fixed wireless access (**FWA**) cannot deliver the functionality of UCLL, including being unbundled to deliver layer 2 voice and/or broadband services. In addition, achieving 100% coverage of the Commission's proposed FWA footprint is a very high cost. Sweden used 2% reflecting its real FWA. Australia used 1% when it did TSLRIC work. In the real world, FWA is more likely to be used in countries where fixed infrastructure is poor and end users do not require guarantee of services.

TSLRIC framework

5 The key issues in this price review process relate to how a standard application of TSLRIC applies in the context of the New Zealand market. These issues include the service to be modelled and the MEA, asset valuation and depreciation, network design and optimisation, and demand assumptions.

6 The current New Zealand market context makes it more important to implement a conventional application of TSLRIC, not less. This is because:

6.1 While attention is rightly focused on the long-term transition to UFB services, it is important to set the right price for copper services which will still be relevant for some time and outside Chorus' UFB areas (noting there are competing networks in other LFC regions).

6.2 It is important for the long-term competitiveness of the market and benefit to New Zealanders to set the right price signal for investment and the industry transition to UFB services going forwards.

6.3 To realise the long-term benefits targeted by the Act, the Commission should give particular weight to regulatory certainty and predictability. This includes taking a conventional approach to TSLRIC, as the Commission signalled to the market in 2002 and 2004.

7 These considerations underpin the importance of the TSLRIC price sending an efficient build or buy signal by reflecting an efficient cost for an HNE supplying the regulated service in New Zealand.

[1] Analysys Mason, "Response to Commission consultation on regulatory framework and modelling approach for UCLL and UBA (6 August 2014) at 1.6 (**Response to July Consultation**).

8 This is consistent with the Commission's explanation of how section 18 should guide decision-making in this price review process. We agree that "the link to section 18 is that predictability supports investment, and investment promotes competition for the long-term benefit of end-users."[2]

9 Against that background, the Commission has rightly looked to respect the objectives of setting an efficient build or buy signal and regulatory predictability. It has adopted an ORC asset valuation methodology and a scorched node approach, and resisted new and unconventional suggestions that it set lower prices by making adjustments for technical performance differences and assumptions about where assets would be re-used by the HNE.

The choice of UCLL / SLU model

10 However the Commission reasons that the HNE would first select its preferred technology, and then consider what services it could supply using that technology. This approach asks the questions in the wrong order.

11 One of our concerns with this proposal is that a hypothetical FTTH/FWA network being modelled will not, without costly changes, support important services that RSPs and end users value highly today.

12 At its most basic, UCLL is a network input that RSPs buy from Chorus in order to provide a more sophisticated service to their retail customers. Technically, FWA cannot be unbundled, so it will not replicate even that most basic function. This underscores the difficulty in selecting the technology first and then identifying what services it can provide. FWA provides a service that is completely different to UCLL.[3]

13 A point to point FTTH network can support the services that RSPs and end users have today as long as the model includes additional costs and "fixes". Without these fixes a number of significant services, and indeed markets, would cease to exist. This includes EFTPOS terminals in shops, and alarms in homes and businesses for a large number of New Zealanders. In addition, Telecom would be unable to buy the network inputs it needs to meet its TSO commitments or provide its legacy resold PSTN voice services.[4]

14 The HNE is a hypothetical construct. But the purpose of the hypothetical is to allow the Commission to set a credible price for an existing regulated service that will apply in a real market. All parties need to see those prices represent the efficient (and not "super-efficient") cost of providing that regulated service. If the Commission models the cost of providing a different service it is difficult to see how that does not carry substantially higher risk of regulatory error in the market context. This also puts at substantial risk the stated aims of promoting regulatory predictability and investor certainty.

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2 Commerce Commission, "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" (9 July 2014) at [80] (**Consultation Paper**).

3 We note that Sweden used 2% in its model and we understand that this was only because it reflected a real world replacement of voice-only lines. Australia used 1%.

4 On this topic see Analysys Mason, Response to July Consultation (6 August 2014) at 1.6. The Swedish regulator has indicated that fixes should be included during cost modelling.

15 To determine the appropriate MEA the starting point should be the regulated service that is being priced. This is a conventional TSLRIC approach.[5] Pricing should reflect the cost of replicating the services that end users receive today. RSPs enjoy the value the regulatory service delivers and the regulatory bargain is that they pay the efficient costs of providing it.

16 An FTTH model is more complicated and uncertain than modelling a copper network. There is less hard data on the design, build and cost of a national FTTH network in New Zealand, and many more assumptions will need to be made. This translates to a higher risk of a pricing error. By contrast, a nationwide HNE copper model grounded in reality (with efficiency assessments) will produce TSLRIC prices for the regulated SLU, UCLL and UBA services with less "re-construction".

The choice of UBA model

17 We agree with the Commission's choice of the UBA model. A key feature of an HNE providing UBA services is that, like actual new entrants in the real world, it will need to build its business on Chorus' current network. This means all new entrants need to adopt a technology that is compatible with the network inputs they will be buying from Chorus. This is as fundamental as a network HNE recognising that it must build its network business cognisant of mountains and lakes.

Preliminary views on key inputs to cost models

18 Once the choice of models has been made, there are a number of important model inputs to be decided. They are important because they influence the TSLRIC estimate, and because they signal the Commission's commitment to regulatory predictability and investment incentives.

Input	Chorus Response
Asset valuation	All assets should be valued at ORC as this will send the right price signals for efficient build / buy incentives. There is significant international regulatory precedent and it is consistent with previously stated Commission views. Cost-based valuation reference points at this time are in the range of $8bn to $11bn, including: o Telecom's 2010 regulatory accounts ($14bn, which we have adjusted to $10.4bn to reflect a previous Commission view of trenching discount factors);[6] o Telstra (roughly converts to $8bn to 10bn); and o NZ Electricity lines businesses ($8.9bn), which excludes the value of Transpower's network.
Optimisation and	Optimisation must be reasonable, realistic and achievable. We

[5] See: Analysys Mason, Response to July Consultation (6 August 2014) at [1.4].

[6] This is Chorus' estimation based on a discount factor for trenching. We note that the Commission made other comments on Telecom's regulatory accounts that haven't been factored into this amount.

scorched node	agree scorched node is the right approach. This approach also has overwhelming regulatory precedent in TSLRIC modelling for these reasons.
Deployment/aerial	The Commission should consider where an HNE might deploy its network over poles (if cheaper), but any such assumptions should take account of the real world constraints associated with different types of deployment. While Chorus is targeting 20% aerial deployment in its UFB areas, we haven't seen anything higher than 16% aerial in a TSLRIC model internationally. Norway used 9% and Portugal 3%.
Demand	The model must take account of changes in forecast demand over Chorus' copper infrastructure, as the modelled costs can only be recovered via the services provided on that infrastructure, and can't be recovered from customers migrating to fibre or mobile services. By spreading the modelled cost for UCLL and UBA across services on other infrastructure including other operators' networks, the Commission will, in the presence of economies of scale, understate the unit costs of providing the regulated service and not meet the forward-looking requirement.
Asset sharing	Opportunities for sharing on third party assets should be considered, but only to the extent that (i) they are realistic given the current New Zealand circumstances and (ii) those services are not assumed to be part of the efficient operator's demand.
Cost allocation	A capacity-based cost allocation method for network costs that are not directly attributable to a service is appropriate because it is simpler, more transparent and more easily understood compared to the Shapley-Shubik method. For non-network costs the EPMU methodology should be adopted. Allocation of cost to the upgraded UFB infrastructure is only appropriate if UFB demand is excluded from demand for the modelled services and should be calculated using a per-subscriber cost allocation method which will facilitate efficient migration to UFB.
Operating expenditure	Chorus' actual operating costs are a good starting point for assessing the operating costs of a new entrant however reasonable and achievable efficiency adjustments may be appropriate.
Depreciation	The depreciation profile has to take account of changes in forecast demand. Simple economic depreciation or adjusted tilted annuity can achieve this. The Commission should be very careful in setting the depreciation profile that it does not backload recovery of cost in a way that will make it practically impossible to recover the efficient cost of the network, particularly given the current

	high level of regulatory uncertainty around the post-2020 framework.
WACC	To estimate an accurate WACC the Commission should take into account all available information including the real world constraints on businesses operating in financial markets and the relatively high systematic risks in the telecommunications industry.

Commission's aggregated layer 1 proposal

19 The UCLL and SLU STD services today mean that there are dis-aggregated layer 1 services as compared to aggregated layer 2 (UBA) services. This drives complexity and we support the Commission's early endeavours to consider the incentives that the final decisions will set for the future.

20 We expect TSLRIC modelling will find that SLU and UCLL costs are broadly comparable with UCLFS costs being higher. Pragmatic "engineering" to get to another outcome risks disconnecting TSLRIC prices for each service, not being consistent with the Act, and not finding a TSLRIC price for each layer 1 STD service.

21 We also note that there is a very small amount of cabinetised unbundling in the market and many RSPs have stated their commitment to a fibre transition. These factors, combined with the fact that commercial backhaul services are prevalent in the market, mean that the Commission should be slow to open new pricing processes for these services absent specific requests on reasonable grounds.

Submission

REGULATORY FRAMEWORK

Regulatory predictability

22 We agree with a lot of what the Commission has said about the regulatory framework for its modelling. In particular, the Commission has emphasised that regulation should be predictable and reasonable investor expectations should be respected.

23 In its Consultation Paper the Commission makes the important statement:[7]

> …we have decided that to help build predictability in regulation, we will respect what we see as reasonable investor expectations in relation to major telecommunications infrastructure. The link to section 18 is that predictability supports investment, and investment promotes competition for the long-term benefit of end-users.

24 The Commission describes the objectives of TSLRIC as investment efficiency and predictability. It also takes note of our current market context, and in particular the large investments being made in UFB infrastructure and the need to transition the New Zealand market to that platform. The Commission observes that the focus should be less toward promoting unbundling on the copper network and more towards the investment efficiency objectives of the Act.

25 We agree with how the Commission has mapped that out. Ensuring that the TSLRIC modelling approach – while of an HNE - is grounded in reality, is something overseas regulators take great care to keep front of mind. We think the Commission has established the right reference points to keep the industry discussion focused on the correct long-term objectives and our market.

26 From those starting points the Commission emphasises that it will take a conventional approach to TSLRIC. This is what predictability means, and is consistent with what the Commission signalled to investors in 2004 when it last described how to approach TSLRIC.

27 Applying a conventional approach, the Commission proposes to use an HNE to assess the efficient levels of costs in providing the UCLL, SLU and UBA services. This is a well-established technique. Also acting predictably, the Commission proposes to value the network of the HNE at ORC. This establishes the "build or buy" price signal that TSLRIC is intended to provide, and is the approach the Commission said it would take in 2004.

28 Consistent with its focus on regulatory predictability and a conventional approach, the Commission has resisted the suggestions from some submitters that it adopt some recent and untested ideas being discussed in some European regulatory jurisdictions that would materially lower the asset valuation from what was expected. The Commission is right to do this. Making distinctions between assets that would be re-used by Chorus in its migration to UFB services and those that would not, and arbitrary adjustments for technical performance, are not part of TSLRIC. They are not widely used in Europe either.

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7 Commerce Commission, Consultation Paper (9 July 2014) at [80].

UCLL model

29 We only differ with respect to the Commission's discussion of the regulatory framework in the Consultation Paper where it departs from a conventional application of TSLRIC. It does so in relation to the technology it assumes the HNE uses in the UCLL model.

30 The Commission proposes to model an HNE UCLL provider with a FTTH network, supplemented by FWA. It arrives at that proposal by first asking what technology an HNE, with a blank sheet of paper, would want to use today. The Commission then double-checks that such a network could at least provide the "core functionality" of the UCLL service.

31 This approach is a new and unique development that could not have been predicted. We have found no other regulator that applies TSLRIC this way. We can find no examples where the technology choice was made before the decision on the service being modelled. There is no precedent for the "core functionality" idea and what it might mean. The choice of technology is a fundamental feature of the UCLL model and should be a predictable regulatory decision.[8]

32 It also results in the Commission modelling an HNE that provides a service that is distinctly different from the UCLL service provided by Chorus. In the HNE's world, services that New Zealanders are dependent on today fail unless they are fibre-compatible. For example, Telecom would be unable to deliver on its TSO commitments without further work and investment. These market issues are explained in more detail in Appendix 2. In short, the device of using an HNE, which is simply intended to provide guidance on an efficient level of costs, becomes wholly unreal.

33 It is unlikely that this kind of modelling will result in a stable regulatory consensus on the appropriate price. The task in the current process is to identify the efficient costs of providing the UCLL service and build or buy signals need to be appropriate to the New Zealand market. Prices set for services that don't deliver the functionalities that end users receive today will fall short of this requirement.

34 We propose two alternative solutions to this problem, both of which result in the Commission modelling an HNE that replicates the UCLL service:

34.1 The first is to model an HNE that uses a modern copper network. This is the most direct, simple, and conventional approach. This is not Chorus' actual network, but simply a network grounded in the New Zealand reality.

34.2 The second solution, if the Commission continues with a fibre model, is to include the costs of enabling the services that end users use today (and continue to expect in future) in the model so that it replicates the functionalities that are present in the market today via the UCLL service.

[8] See: Analysys Mason, Response to July Consultation (6 August 2014) at [1.4].

35 If the model is FTTH/FWA then it replaces the UCLL MPF with either:

35.1 P2P FTTH as P2P is the fibre equivalent of UCLL, as opposed to GPON which is not able to be unbundled on a per-user basis (i.e. in a manner consistent with the UCLL service). Modelling P2P FTTH is consistent with the expert opinions of TERA and Analysys Mason;[9] or

35.2 FWA (although for the reasons set out below we do not believe FWA can be included).

36 The following diagrams illustrate what this will require:

36.1 Figure 1 below illustrates the current situation of a customer with voice and broadband service provided by an RSP over UCLL from a DSLAM.

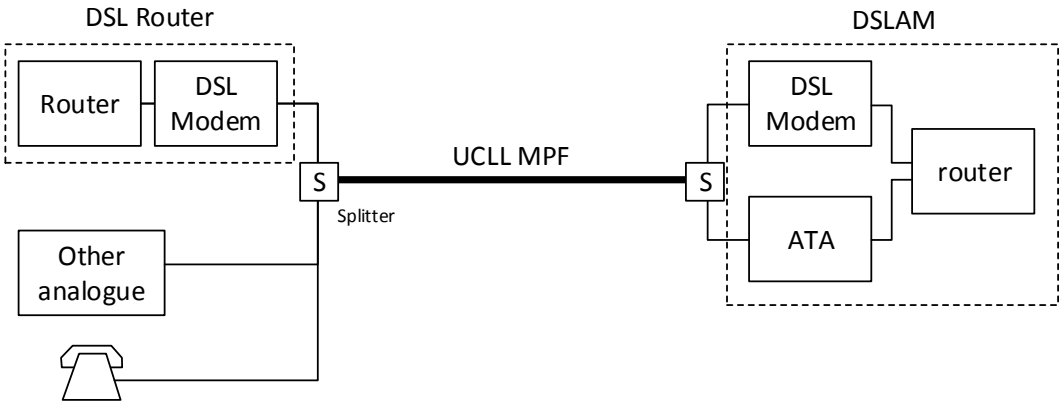


Figure 1: Voice and broadband over UCLL

36.2 Figure 2 below illustrates the situation of a customer with voice and broadband service provided by an RSP over P2P FTTH. An RSP's DSLAM equipment would need to be replaced by an optical equivalent (e.g. an Ethernet switch). The customer's DSL modem would also need to be replaced by an optical equivalent. Analogue telephone line functions in the DSLAM would need to be replaced by an equivalent function at the customer premises. New equipment required is shown in red.

[9] See: Analysys Mason, Response to July Consultation (6 August 2014) at [1.14] and TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: Modern Equivalent Assets and relevant scenarios" (July 2014) at page 37 (**Modern Equivalent Assets Paper**).

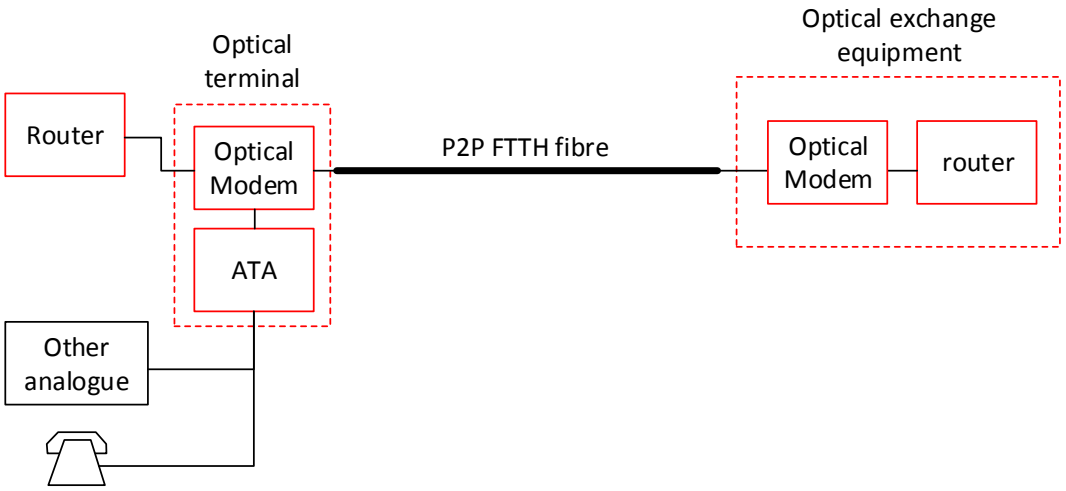


Figure 2: Voice and broadband over P2P FTTH

37 If fibre technology is adopted then nothing which connects to a copper pair will work without fixes. So, all existing devices will need either to be replaced with a set of equivalents, which together can utilise the fibre connection, or a means found to adapt them to the fibre connection.

38 Figure 3 below illustrates the situation of a customer with voice and broadband service provided by an RSP over FWA. As FWA can provide only a Layer 2 service, it incorporates functions which are performed by DSL modems in CPE and the RSP's DSLAM in the case of UCLL. A customer's DSL router would need to be replaced by a router able to connect to the FWA service. Analogue telephone line functions at the customer premises would also require new equipment. New equipment required is shown in red.

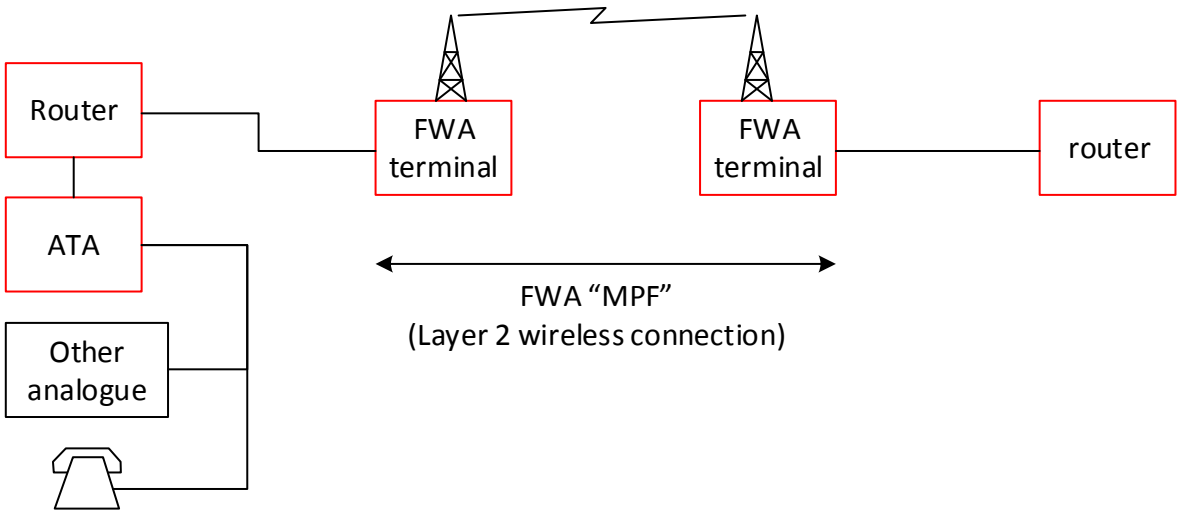


Figure 3: Voice and broadband over FWA

39 FWA should not be included in the Commission's model. FWA cannot be unbundled at layer 1 so it does not replicate the most basic functionality of UCLL, and is not a suitable input for an RSP looking to provide differentiation with its choice of technology and capacity to the end user. FWA can only be unbundled at layer 2, and the overall capacity of a FWA network is controlled by the wholesaler rather than the RSP. In contrast, UCLL is a layer 1 input that enables the RSP to provide a differentiated offering on both broadband and voice.

40 If the Commission intends to model P2P FTTH as the MEA the following should occur:

40.1 The Commission should include the cost of all the "fixes" that the FTTH HNE would have to offer to RSPs and consumers in order to support the services they enjoy today. This means including in the model the cost of adding the necessary equipment and making the changes so that alarms, EFTPOS, SKY, dial-up, TSO services and the like continue to operate.

40.2 A decision to model a FTTH network with no cabinets would make it difficult to model cost-reflective prices for the non-cabinetised UCLL (**NC UCLL**) and SLU services. This is because a FTTH network model would only produce an average cost for all lines (**FUCLL**), and could not reveal separate costs for non-cabinetised lines, or for the sub-loop portion of cabinetised lines. If it decides to proceed with an FTTH approach, the Commission will need to use the separate copper/FTTN model in order to set a cost-reflective price for both the NC UCLL service and the SLU service. One way it could do this is to use the FTTH model to determine the optimised costs and then use the separate copper/FTTN model to determine the relative proportions of costs for NC UCLL, SLU and UCLFS, and then set cost-reflective prices using the optimised costs from the FTTH model and the proportions derived from the copper/FTTN model.

41 Only then will the model provide full visibility of the efficient costs of replicating the UCLL service. As we stated above, the more direct and simple approach would be to model a modern copper network.

The UBA model

42 In contrast, the Commission has correctly identified that a key feature of an HNE providing UBA services is that, like actual new entrants, it will need to build its business on Chorus' current network.

43 This means all new entrants need to adopt a technology that is compatible with the network inputs they will be buying from Chorus. This is as fundamental as a network HNE recognising that it must build its network business cognisant of mountains and lakes. Using this model puts the Commission on a path to set a regulated price that reflects the real world experience of Chorus and others as to the achievable level of efficiency in UBA markets.

44 In Appendix 1 we respond to the detail of the Commission's discussion of the regulatory framework.

KEY INPUTS TO TSLRIC MODEL

45 In this section, we set out Chorus' view on the key modelling parameters, which in summary are:

Input	Chorus Response
Optimisation and scorched node	Optimisation is the right approach, but it must be reasonable, realistic and achievable. We agree scorched node is the right approach. This approach also has overwhelming regulatory precedent in TSLRIC modelling for these reasons.
Deployment/aerial	The Commission should consider where an HNE might deploy its network over poles (if cheaper), but any such assumptions should take account of the real world constraints associated with different types of deployment. While Chorus is targeting 20% aerial deployment in its UFB areas, we haven't seen anything higher than 16% aerial in a TSLRIC model internationally. Norway used 9% and Portugal 3%.
Demand	The model must take account of changes in forecast demand over Chorus' copper infrastructure, as the modelled costs can only be recovered via the services provided on that infrastructure, and can't be recovered from customers migrating to fibre or mobile services. By spreading the modelled cost for UCLL and UBA across services on other infrastructure including other operators' networks, the Commission will, in the presence of economies of scale, understate the unit costs of providing the regulated service and not meet the forward-looking requirement.
Asset sharing	Opportunities for sharing on third party assets should be considered, but only to the extent that (i) they are realistic given the current New Zealand circumstances and (ii) those services are not assumed to be part of the efficient operator's demand.
Cost allocation	A capacity-based cost allocation method for network costs that are not directly attributable to a service is appropriate because it is simpler, more transparent and more easily understood compared to the Shapley-Shubik method. For non-network costs the EPMU methodology should be adopted. Allocation of cost to the upgraded UFB infrastructure is only appropriate if UFB demand is excluded from demand for the modelled services and should be calculated using a per-subscriber cost allocation method which will facilitate efficient migration to UFB.
Operating expenditure	Chorus' actual operating costs are a good starting point for assessing the operating costs of a new entrant however reasonable and achievable efficiency adjustments may be appropriate.

Depreciation	The depreciation profile has to take account of changes in forecast demand. Simple economic depreciation or adjusted tilted annuity can achieve this. The Commission should be very careful in setting the depreciation profile that it does not backload recovery of cost in a way that will make it practically impossible to recover the efficient cost of the network, particularly given the current high level of regulatory uncertainty about the post-2020 framework.

Modelling efficiency

46 At all stages of the model building process the discussion of inputs will likely come back to efficiency. This is because the reason that the Commission is setting these prices is to determine the efficient costs of supplying UCLL, SLU, and UBA, and no more or less than that.

47 This objective should guide the Commission when filling out the detail of its HNE and making decisions about model inputs. In order to identify the efficient level of costs of supplying these services the Commission is required to be confident that its decisions are fact based and reflect New Zealand conditions. When making decisions on each model input it should be sure that it is asking of the HNE a realistic and attainable standard of efficiency. On our reading of the high level discussion in the Consultation Paper this is what the Commission is proposing to do.

48 At all stages of the model building process the discussion of inputs will likely come back to efficiency. This is because the reason that the Commission is setting these prices is to determine the efficient costs of supplying UCLL, SLU, and UBA, for the purpose of setting efficient build/buy incentives.

49 We have taken this approach when discussing particular model inputs, below. Where we are providing information on Chorus' experience, we do not expect the Commission or RSPs to adopt that without question. However, Chorus' experience is an instructive starting point on most modelling inputs. Chorus is under considerable pressure to transition to fibre as efficiently as possible and to operate its FTTN network as efficiently as possible.

50 Where it is suggested during the modelling process that an HNE would be more efficient, we believe evidence indicating how and why should be provided. Equally, where Chorus is shown to be constrained by real world, externally imposed restrictions or costs, the HNE should be assumed to face those same external constraints or the case made as to why not.

51 When modelling demand for the regulated services the same approach should be taken. Forecasts of sales volumes for regulated layer 1 copper services and UBA during the regulatory period should be realistic bearing in mind other networks and potential substitution, including fibre to mobile substitution.

Optimisation and scorched node

52 We agree with the Commission that a scorched node approach is the right approach.

53 The Commission is correct to adopt a scorched node approach, because:

53.1 It is consistent with what is commonly adopted as part of a forward-looking TSLRIC modelling exercise, and therefore it is consistent with reasonable investor expectations;

53.2 It is important that the Commission's cost model is grounded in reality, and the reality is that the nodes of a network cannot be readily altered. A scorched node approach will result in a modelled network which is efficient, but not 'super-efficient', and reflects the conditions in New Zealand; and

53.3 Scorched node is a less complex and more practical than scorched earth, and so it is more likely to ensure timely delivery of the cost model.

54 International regulatory precedent illustrates that scorched node is very commonly adopted when applying a TSLRIC costing methodology. For example, regulators in Australia, the United States, the United Kingdom, Ireland, France, Germany, Denmark, Sweden, Belgium and Luxembourg have all expressed a preference for a scorched node approach over a scorched earth approach.

55 The Irish Commission for Communications Regulation, for example, has noted that such an approach *"to the extent practicable and relevant, reflects [the] actual network topography. This ensures that the model retains an appropriate degree of realism"*.[10]

56 Analysys Mason has advised that for modelling purposes an optimised network means the least cost network that could practicably be built. It is not a network that could never be built in practice – such a network would not send appropriate build or buy signals:[11]

> The optimisation cannot be to such a degree that the optimised network is incapable of being built, or of providing the required functionality over time.

57 Analysys Mason describes a number of reasonable limits:[12]

> …it would not be reasonable to assume that the network was shared with an entity that does not have assets in the required locations, or to assume the use of aerial deployment in locations where this is not consistent with local planning regulations. Capital costs need to reflect New Zealand conditions (e.g. seismic bracing, volcanic rock in some locations, hilly terrain, shelter belts of trees). The modelled operating costs must be consistent with the assumed network layout (cabinetisation, aerial deployment) and with the conditions applying in New Zealand (weather, contractor costs, etc). The best way to ensure that the operating costs are achievable will be to compare to the actual costs incurred by existing wireline operators in New Zealand.

[10] Commission for Communications Regulation "Response to Consultations and Final Decision: Local Loop Unbundling and Subloop Unbundling Maximum Monthly Rental Charges" (9 February 2010) at 10.

[11] Analysys Mason, Response to July Consultation (6 August 2014) at [1.13].

[12] Analysys Mason, Response to July Consultation (6 August 2014) at [1.13].

Deployment/aerial

58 An important decision in this context is identifying the correct proportion of aerial deployment that an HNE would target, and achieve, when entering New Zealand markets on a national scale.

59 The Commission should consider where an HNE might deploy its network over poles (if cheaper), but any such assumptions should take account of the real world constraints associated with different types of deployment. While Chorus is targeting 20% aerial deployment in its UFB areas, we haven't seen anything higher than 16% aerial in a TSLRIC model internationally. Norway used 9% and Portugal 3%.

Real world experience

60 At a high level, aerial deployment of a network seems like an attractive idea. However the real world experience is something different. Today's network delivering the regulated services comprises only a very small amount of aerial.

61 Chorus' experience with the UFB rollout provides relevant, timely evidence for the level of aerial deployment that is practically achievable.

62 Chorus, like the HNE, is incentivised to deploy its network efficiently and is actively attempting to maximise aerial deployment where this is most cost-effective within the project timeframes. However, our expectation is to achieve approximately 20% aerial deployment in UFB areas. What is preventing us from achieving a higher percentage is a combination of legal constraints, an inability to secure access to the poles of third parties, and the cost of securing access.

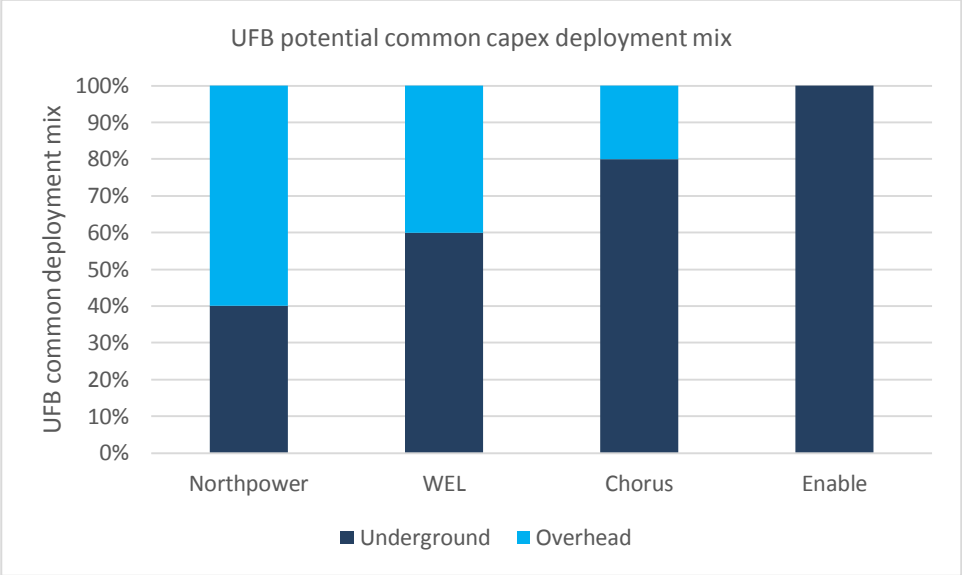
63 Our experience is consistent with other international fibre roll-outs. In Australia, the NBN corporate plan originally had 25% aerial rollout, but this met with significant difficulties. The NBN rollout is now under review,[13] with the potential of regulatory concessions from State Governments being required to achieve higher levels of aerial deployment.

64 The experience of other LFCs is also potentially relevant. However, not all other LFCs are in a similar situation to the HNE, and therefore their experience will be of less relevance to a nationwide HNE. For example, an LFC with a pre-existing pole and aerial distribution network such as Northpower Limited will be in a different position from an HNE which lacks such infrastructure.

65 However, even in the case of Northpower it is predicted by one independent analyst that it will expend 40% of its capex on underground network (even though Northpower's deployment is in an area in which local planning rules permit deployment of aerial distribution network). Goldman Sachs also estimated that other LFCs will underground between 60% (in the case of WEL Networks deployment in areas including Hamilton,

[13] See generally: Chris Griffith "Aerial NBN cabling gains favour" (12 November 2013), available at: http://www.theaustralian.com.au/technology/aerial-nbn-cabling-gains-favour/story-fn4iyzsr-1226757632321?nk=f9ae9f18556c780e3b6647674eb53d8d.

Tauranga, New Plymouth and Wanganui) and 100% (in the case of Enable Services Limited deployment in Christchurch and Rangiora) of their networks.[14]



Source: Goldman Sachs

66 This range itself informs what assumptions about aerial deployment of network nationally are realistic. LRIC modelling practice internationally reflects this. We haven't seen aerial deployment higher than 16% in any LRIC model internationally.

Real world constraints

67 There are a number of real world constraints on the amount of aerial deployment that any network builder in New Zealand could achieve. Before settling on the appropriate degree of aerial deployment for its model the Commission must have regard to these constraints. To do otherwise is to model costs that no efficient operator could ever hope to achieve.

Lifetime costs

68 The Commission should satisfy itself that aerial deployment is indeed cheaper than trenching in a particular region by considering costs over the lifetime of the assets and not just upfront costs.

69 There are a number of considerations here. First, the lifetime of a cable deployed aerially is likely to be lower than the lifetime of a cable in a duct because of its exposure to the elements. This needs to be taken into account in the costs – any HNE would factor in the cost of replacing the cable more frequently. For the same reasons the aerial cable is likely to incur higher maintenance costs than a ducted cable. Likewise poles incur higher maintenance costs, some or all of which will fall on the HNE.

[14] Goldman Sachs Global Investment Research (26 August 2013) at page 4.

70 Further, even where fibre cables are deployed aerially, generally this is a temporary rather than permanent outcome due to anticipated overhead to underground conversion requirements.

71 Undergrounding is driven by undergrounding programmes by lines companies, and by road widening and neighbourhood beautification programmes driven by local councils. Therefore, the capital investment involved in underground deployment is not avoided; it is merely deferred. We expect the long term total cost of ownership of aerial approaches that of underground deployment, with a replacement rate of around 1% per annum. Chorus may deploy aerial in the short term as it is capital constrained, but expects it will need to spend the money in the future to underground the infrastructure.

72 For example, Vector has typically converted approximately 1000 premises underground per year on an ongoing basis and has approached Chorus to participate in several overhead to underground conversion projects planned in Auckland which will total in excess of 1000 premises converted. Chorus' costs as a result of converting 900 premises in the Udys Rd area in Pakuranga will be approximately **[**

].

Local authority regulation

73 There are legal constraints under the RMA and other relevant legislation that apply to all network builders. Chorus has commissioned an expert report from Christopher Horne of Incite (Auckland) Limited on the relevant planning constraints that apply to all network builders, and this report is **attached** as Appendix 3 to this submission.

Pole space availability and terms

74 The Commission should only consider aerial deployment where pole space is actually available. This may require asking lines companies for information on the availability of pole space on their networks, and the commercial terms of access they set.

75 Chorus' experience in relation to UFB deployment is that, while there are differences in pricing between areas reflecting both commercial incentives and underlying costs of pole owners in providing access, reasonable consistency exists in the structure and level of pricing for access.

Chorus pole network

76 Finally, in assessing the practical level of aerial deployment able to be achieved in New Zealand by an HNE that replaces Chorus' copper network, the Commission is required to assume that the poles in Chorus' copper network are not available for sharing (just as it cannot assume the availability of Chorus' ducts and trenches).

77 Accordingly, if aerial deployment is required in areas in which demand is currently served by Chorus' pole network, whether an HNE's deployment of either distribution network or service leads is achievable depends on a realistic assessment of the ability of an HNE to deploy new poles. The evidence of the expert planner is that this will not be possible in most cases given the antipathy of local authorities to new poles. This will be a very common issue, as in most cases where Chorus has deployed aerially, demand on at least one side of the street will be served from Chorus poles.

78 Other information in relation to aerial deployment is also available to the Commission which enables a more granular assessment. In Appendix 3 we describe relevant constraints on deploying an aerial network in New Zealand in more detail, both by reference to Chorus' particular experience in UFB deployment and the general constraints existing on deployment available from public sources.

79 In summary, the information described in Appendix 3 indicates that:

79.1 Seeking to deploy a completely new aerial lines network (i.e., poles and cables) would not be practical, as it would be unlikely to be granted resource consents;

79.2 The best approach for a new operator to consent a new aerial network would be to limit it to areas where there are already existing aerial networks (e.g. electricity lines networks) that can be utilised – and even this will have challenges from a consenting perspective in urban areas, meaning a proportion of network will likely have to be deployed underground even where aerial networks are available;

79.3 Third party aerial networks are not ubiquitous. In particular, aerial networks are generally not available in recent sub-divisions in which all utilities are required to be deployed underground. Nor do electricity lines networks serve all demand in areas in which they exist: in most areas the lines network is itself dependent (as is Chorus) on Chorus' existing pole network to serve demand on one side of the street;

79.4 There are real capacity constraints in obtaining access to aerial networks. At the very least, capacity must be tested before deployment and in many cases the network strengthened. Some poles cannot withstand the weight of additional fibre and therefore need to be replaced. This carries an additional cost to the new operator;

79.5 Not all lines companies are prepared to agree to aerial deployment of distribution network, as opposed to aerial deployment of service leads. Even where companies do agree, most have progressive undergrounding policies that will eventually force investment in undergrounding aerial networks. However, most companies will accept (at least temporary) aerial deployment of distribution network subject to appropriate commercial terms and capacity issues; and

79.6 Bill and keep arrangements are generally not achievable in practice, and Chorus does not presently have any. To the extent that Chorus' "gentlemen's agreements" relating to drop leads in the existing copper network amount to bill and keep arrangements, these would not be achievable for an HNE, which would have no poles for lines companies to use for electricity lead-ins given regulatory constraints on pole deployment.

80 These real world constraints on the amount of aerial deployment that an HNE could realistically achieve should be accounted for in the Commission's modelling assumptions.

Demand

81 The demand forecast in the TSLRIC model plays an important role in arriving at an appropriate TSLRIC price. In simple terms it is the denominator used to divide the estimate of total costs to arrive at a per unit price.

82 The appropriate demand forecast in a TSLRIC model is the best available forecast of the volume of the products that the regulated entity is expected to provide over the regulated network infrastructure during the regulatory period. In the case of the regulated layer 1 copper services, this is the forecast of Chorus' sales of services provided over the UCLL/UBA network infrastructure during the regulatory period. This represents a conventional TSLRIC approach which reflects the importance of regulation meeting investor expectations for an NPV=0 regulatory framework.

83 We understand the Commission to be proposing to include sales volumes from services sold on other networks as part of the demand in the TSLRIC model (the '100% demand assumption')15 and to keep this demand constant over the regulatory period. This is unusual, unpredictable, and a departure from a conventional application of the TSLRIC methodology which could have a significant effect on Chorus and its investors.

Forecast demand

84 The use of forecast demand is a conventional approach to TSLRIC. Using the best available forecast of demand for the relevant services is not a departure from the HNE construct, nor a departure from the forward-looking efficiency standard. Rather, it represents an acknowledgement that the best forecast volume of the HNE is the forecast volume of the incumbent.

85 In light of this, we have provided the Commission with demand forecasts which reflect the following dynamics:

85.1 An HNE UCLL STD service provider which replaces Chorus' copper network infrastructure and displaces Chorus in serving the demand currently served on the copper network;

85.2 The mobile and HFC networks currently in the market continue to exist, and during the regulatory period these networks will win over customers currently on the copper network infrastructure;

85.3 The non-Chorus LFCs currently in the market continue to exist, and during the regulatory period will win over some customers currently on the copper network infrastructure; and

85.4 Chorus continues to build and operate its UFB infrastructure, and during the regulatory period customers will migrate to Chorus' new UFB infrastructure.

[15] TERA defines demand as the demand for copper/FTTN + FTTH + FWA in TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 60.

86 CEG notes that[16]:

> In terms of Chorus' approach to demand, we believe this approach is consistent with the common implementation of TSLRIC. Indeed, it appears to accord with the Commission's own statements defining the 'total service' component of TSLRIC and the practice of regulators in other jurisdictions.

87 We also note that, internationally, regulators use the actual demand for the incumbent as a starting point for the network being modelled. This is illustrated by the following examples from Sweden and Denmark.

88 In Sweden:[17]

> The starting point for traffic demand is the existing traffic currently travelling over the SMP operator's network, as evidenced by the actual volumes sold.

89 In Denmark:[18]

> The starting point when building the bottom-up model is the level of demand in Denmark for all the services using the access and the core network of an SMP operator along with an allowance for growth.

Price effect during transition

90 Some concern has been expressed that applying TSLRIC during the period of migration from copper services to UFB services could result in a "price spiral". The concern here is that during the migration, the costs of the optimised network will stay approximately the same, but the forecast volume in the denominator will drop.

91 It is not clear that this scenario will eventuate or is problematic for this FPP process. There are well-established methods for avoiding a price spiral, including the application of a demand-adjusted tilted annuity. In addition, as Chorus and its experts flagged during the UBA IPP process, in UFB areas, RSPs will have new alternatives to the copper services.

92 Further to this, there is a relationship between the demand and sharing assumptions in the TSLRIC model which will mitigate concerns about a price spiral. Any assumptions of asset sharing will act to reduce the costs that are to be recovered from the copper services if, as we propose, the sharing is calculated using a per-subscriber cost allocation method (as discussed at paragraph 111). That is, as the demand for copper services falls, so does the cost of shared assets allocated to the copper services in Chorus' UFB areas.

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16 CEG "Demand in forward looking cost models" (August 2014) at [18].

17 Swedish Post and Telecom Authority "Draft Model Reference Paper Guidelines for the LRIC bottom-up and top-down models" (4 February 2010) at page 19.

18 TERA Consultants "Modification and development of the LRAIC model for fixed networks 2012-2014 in Denmark: Draft Model Reference paper" (May 2013) at page 55.

93 If demand is (appropriately) modelled as forecast volumes of the regulated product, then there should also be an assumption that the HNE explores realistic asset sharing opportunities with any third party network provider which services demand independently of the HNE. Similarly, in this scenario, the Commission should explore sharing opportunities between the modelled network and Chorus' UFB infrastructure. Of course, the Commission cannot assume any sharing if the demand on other networks is already assumed to be served by the HNE.

100% demand assumption

94 The Commission proposes to model 100% of demand and to "assume no initial ramp-up or migration away to alternative networks".[19] The Consultation Paper suggests that, by modelling the efficient costs of building a network to meet 100% of demand, the appropriate incentives to invest are provided. According to TERA, "100% demand" is the demand for copper/FTTN+FTTH+FWA.[20]

95 By assuming a constant 100% demand during the regulatory period, the Commission will model demand as including the volume of customers purchasing:

95.1 Chorus' copper services;

95.2 Chorus' UFB services; and

95.3 Services on non-Chorus LFC networks.

96 This proposal will result in the efficient costs of the UCLL/UBA network infrastructure being spread across volumes of services sold by providers other than Chorus, as well as volumes of services sold by Chorus using its UFB infrastructure. This is an unexpected result, and one that we cannot reconcile with the HNE construct. The HNE construct is a device intended to allow a conversation about the efficient level of costs; it is not a license to make unrealistic assumptions about scale which would prevent that efficient level of costs from being recovered. It is inconsistent with the conventional approach to TSLRIC explained above, and contrary to investor expectations and regulatory predictability.

97 In the expert view of CEG:[21]

> The Commission's position in relation to demand is a substantial deviation from accepted regulatory practice in relation to TSLRIC. In the language of TSLRIC, the Commission has defined the *total service* to include services beyond those supplied by the service provider using its assets.
>
> The Commission has previously guided Chorus that it would model the *total service* (or demand) based on all services that use the assets used to provide the regulated service:
>
> > *The total service should in principle include all services that use the assets used by the designated interconnection services. This definition of the total service takes into account the access provider's provision of other telecommunications services, in the*

[19] Commerce Commission, Consultation Paper (9 July 2014) at [236].

[20] TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 60.

[21] CEG "Demand in forward-looking cost models" (August 2014) at [74] – [76].

> *sense that these services share costs with interconnection services. This should lead to an appropriate range of services over which to allocate the assets' costs*

This original position was reiterated in its process and issues paper which stated:

> *The term 'total service' refers to the total amount of the service provided by the network operator. The total amount includes the quantity supplied to the various access seekers and the quantity the network operator supplies to itself. This means that the TSLRIC is different from the incremental cost the network operator incurs in supplying the last unit of the service, or the incremental cost of providing the service to one particular access seeker*

98 CEG further notes that, by spreading the modelled cost for UCLL and UBA across services provided on other infrastructure including services that are not supplied by Chorus, the Commission will, in the presence of economies of scale, understate the unit costs of providing the regulated service. This, according to CEG, is an error in terms of arriving at the forward-looking costs of providing the regulated service.[22]

99 The problem identified above is further exacerbated over time as migration away from Chorus' fixed access network services to non-Chorus LFC networks and some fixed to mobile substitution occurs. For example, recent reports from Northpower Fibre suggests that it will reach its projected 60% UFB penetration by 2017, and possibly sooner. We note that Northpower Fibre has, for example, completed its roll-out in Whangarei ahead of schedule and is experiencing a take up of as much as 32% of premises in some business areas of the city.[23] Also, some fixed-to-mobile substitution can be expected over the relevant regulatory period.

Investor expectations

100 The conventional TSLRIC approach reflects the importance of regulation meeting investor expectations for an NPV=0 regulatory framework. It is axiomatic that good regulation should give the investor an *ex ante* expectation of a normal return.

101 In the TSLRIC context, the investment cost is optimised, potentially using technology different to that used by the service provider, which necessarily limits the ability for the service provider to achieve NPV=0 on its actual investment. However once that is done, the regulatory settings should at least give an investor an *ex ante* expectation of earning a return of, and a return on, the *optimised* investment. Again in high level terms, this means it is important that over the lifetime of the investment, in NPV terms:

$$\begin{aligned} &Regulated\ unit\ price \\ &\quad \times\ forecast\ volume\ of\ sales\ of\ services\ that\ use\ the\ UCLL/UBA\ network \\ &\quad = optimised\ investment\ in\ the\ UCLL \\ &\quad /UBA\ network\ (including\ normal\ return) \\ &\quad + operating\ and\ maintenance\ costs \end{aligned}$$

102 As noted by CEG: [24]

[22] CEG "Demand in forward-looking cost models" (August 2014) at [79].

[23] http://www.crownfibre.govt.nz/2014/05/northpower-fibre-point-completing-ufb-roll/. Accessed July 2014.

[24] CEG "Demand in forward-looking cost models" (August 2014) at [42].

> […] in order to encourage efficient investment, the Commission needs to implement TSLRIC in a manner that if applied in perpetuity to new assets would be consistent with the NPV=0 principle. This requires realistic, achievable modelling assumptions and it requires that, at a minimum, prices be set to recover the expected change in the replacement cost of assets over the pricing period (including a normal return on those assets.

103 The proposal in the Consultation Paper will result in a situation where Chorus will have an *ex ante* expectation of NPV < 0. This is a result of:

103.1 Arriving at a unit price by spreading the optimised investment cost over by a volume amount that includes the volumes of services sold on other networks; and

103.2 Chorus' expected regulated revenue being a function of the volume of services sold over the UCLL/UBA network infrastructure.

104 As the Commission has recognised elsewhere, it is a fundamental principle of good regulation that regulatory settings provide investors with an *ex ante* expectation of normal returns.[25] In contrast, the proposal in the Consultation Paper makes it a certainty that less than the optimised investment amount will be recovered.

105 CEG advises:[26]

> Whilst TSLRIC involves re-setting prices periodically based on forward-looking costs, it is axiomatic that this (and any) form of regulation must give the investor an *ex ante* expectation of a normal return.
>
> As the Commission notes, under TSLRIC investors should have had an expectation of re-optimisations and revaluations of their assets over time. However, investors could not reasonably have had an expectation that the Commission would not give Chorus the opportunity to recover optimised cost of their assets from end-users. Nevertheless, the Commission's approach of calculating the price based on demand which Chorus does not service, will result in a revenue stream that does not recover forward looking costs.

106 The Consultation Paper arrives at this result by including in the TSLRIC model the volumes of services sold by parties other than Chorus, and the volumes that Chorus sells on infrastructure other than its UCLL/UBA infrastructure. This goes beyond the statutory definition of TSLRIC and the reference to the service provider's provision of other telecommunications services. The statutory definition requires recognition of shared assets, which is conventional. This does not extend to including services sold by different parties or on different networks in the modelled demand. These are irrelevant considerations and should be excluded from the statutory calculation.

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[25] Commerce Commission, "Input Methodologies Discussion Paper" (June 2009) at [X13]; Commerce Commission, "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper" (December 2010) at [2.8.12]; *Wellington International Airport & Ors v Commerce Commission* [2013] NZHC 3289 at [256] – [266].

[26] CEG "Demand in forward looking cost models" (August 2014) at [62] – [63].

Asset sharing

107 We believe an efficient operator should be modelled as sharing with third party networks. However, the Commission should ensure that any assumptions it makes around asset sharing are grounded in reality and supported by evidence. The Commission can only model sharing if there is spare capacity on the relevant third party network, regulations permit the sharing of facilities, sharing is realistically achievable and would be likely to take place in the real world.

108 In this context, it is also important that the Commission does not put undue weight on asset sharing in other jurisdictions, where the incumbent is likely to face an entirely different set of rules, regulations and incentives to share (or not) than an HNE in New Zealand. For example, the Swedish regulator PTS notes in its model documentation that sharing with other infrastructure (e.g. electricity, cable TV or other operators) is usually possible, and in some areas it is encouraged or even obligatory according to local regulations.[27]

109 We discuss the amount of sharing which an HNE could realistically achieve from paragraphs 58 to 80 above, on deployment/aerial.

110 In addition, to be internally consistent, the model can only assume the efficient operator shares with services that are not already assumed to be part of its demand. If the Commission continues to model the HNE assuming it services demand that is in fact serviced by other networks, the model cannot at the same time assume those other networks exist for the purposes of asset sharing. This principle applies to Chorus' upgraded UFB infrastructure as well as to other LFCs' networks.[28]

Cost allocation

111 Chorus believes that the Commission should adopt a capacity-based cost allocation method for network costs that are not directly attributable. As noted by Analysys Mason, the use of the Shapley-Shubik allocation method (proposed in the Consultation Paper) will substantially increase the complexity of the modelling system, causing it to be less transparent and slower, and also leading to an undesirable dependence of the result on the number of services modelled.[29] By comparison, allocation based on capacity is simple, transparent and easily understood, does not slow down the model's running time, and does not depend on the number of services modelled.

112 We agree that the Commission should use an EPMU methodology for non-network costs that are not directly attributable.

113 The Commission also notes that its view is that a TSLRIC model needs to take into account both regulated and unregulated services to capture the right economies of scope and scale. As such, its model will allow for a reasonable allocation of UBA/UCLL services of costs shared with both regulated and unregulated services provided by the service

[27] Swedish Post and Telecom Authority "Dokumentation av hybridmodell" (16 December 2013) at page 28.

[28] Analysys Mason, Response to July Consultation (6 August 2014) at [1.17.5].

[29] Analysys Mason, Response to July Consultation (6 August 2014) at [1.17.2].

provider, and non-regulated services for assets shared with third parties, such as an electricity poles.

114 If UFB services are not included in the demand for the modelled operator (consistent with Chorus' proposal), then common costs (particularly trench and duct costs) in Chorus UFB areas will need to be allocated between copper and fibre. We think this cost should be allocated based on the number of subscribers on copper vs fibre in Chorus UFB areas, since this method will result in prices which vary smoothly over time and costs that vary in proportion to the customer base on each and so support an efficient migration. Analysys Mason supports this approach and notes that an approach like this has been adopted by the French regulator.[30]

Operating expenditure

115 In our view, Chorus' actual operating expenditure is an appropriate starting point for determining the operating expenditure that will reflect an achievable standard of efficiency, potentially adjusted for:

115.1 The choice of MEA;

115.2 The types of deployment in the network; and

115.3 Any perceived inefficiencies.

116 We note that the use of the incumbents' operating expenditure in informing the modelled operating expenditure is common practice in bottom-up models.

117 Chorus' costs are likely to be informative as to the cost of an HNE, given that:

117.1 Chorus was designed from the bottom up when it was separated from Telecom. This particularly applies to corporate overheads, network planning, sales and marketing;

117.2 Where it wasn't possible to begin on a clean slate basis (for example, in relation to integrated IT systems), Chorus has progressively moved to stand-alone systems. Its costs are a good indication of the costs for an HNE starting up such systems; and

117.3 As a publicly listed company, Chorus' costs are under continual scrutiny – both internally and externally.

118 It is notable that the recent Ernst & Young review of operating costs identified savings that might come from lowering service levels and increasing lead times for fault repairs.[31] Ernst & Young did not find that operating cost levels in Chorus were out of line

[30] Analysys Mason, Response to July Consultation (6 August 2014) at [1.17.6]; ARCEP Decision No. 2010-1211 Defining the economic terms governing access to France Telecom local loop civil engineering duct infrastructure (November 2010) at page 10, available at: http://www.arcep.fr/uploads/tx_gsavis/10-1211.pdf (in French).

[31] Ernst & Young "Independent Assessment of Chorus' Financial Position" (12 December 2013).

with Chorus' peers. Ernst & Young also identified potential increases in operation expenditure costs from delaying capital expenditure on proactive network maintenance, and delaying investment in new IT systems.[32]

119 The Commission should exercise caution in utilising operating cost data from other LFCs and applying those to the modelled operator. The Commission has already proposed that the HNE will have the same service profile as Chorus, in the sense that the HNE's non-regulated services will be based on the services offered by Chorus in the market at the time that the final price is determined.[33] This is a sensible approach as it allows the Commission to allocate operating expenses between these services in a manner that is comparable to Chorus' actual experience.

120 It would be wrong for example to assume that the HNE is a vertically integrated company with the capacity to spread its overheads or IT costs across a wide range of telecommunication activities. A similar issue arises with the other LFCs. Generally the other LFCs have a substantial electricity business which is much larger than their fibre business and can allocate costs over a wider range of activities than the modelled operator. Operating costs from LFCs relating to fibre are therefore likely to be relatively small, and provide little guidance on the appropriate operating costs for the modelled operator.

121 The Commission should also exercise caution in benchmarking operating expenditure from incumbent service providers in other jurisdictions. Operating expenditure largely consists of labour costs, which vary significantly between countries. Incumbents in other countries may also have different structures from the modelled HNE in New Zealand (e.g. vertically integrated, and/or provide a different range of services). Straight benchmarking would therefore potentially be misleading.

122 In addition to establishing appropriate operating costs for the HNE, the Commission is required to form a view on how these costs might change over the course of the regulatory period. The expected change in costs can be determined using the cost escalation methodology we discuss in the context of depreciation, below. This involves estimating efficient operating expenditure, breaking down the estimate of operating expenditure into components of raw materials, obtaining futures prices or expert forecasts for the raw materials, and determining the appropriate cost escalators.

123 Cost escalation should be applied over the regulatory control period to index forward a base level of operating costs estimated in (say) the year directly preceding the start of the regulatory period. While the escalation of costs is designed to capture the underlying changes in unit prices faced by the efficient new entrant, the base level of costs should be calculated to ensure that it is sufficient to compensate the efficient new entrant for its costs.

124 In particular, the base level of operating costs needs to take into account the lifetime level of operating expenditure. A new network, such as that modelled by the

[32] Ernst & Young "Independent Assessment of Chorus' Financial Position" (12 December 2013), Appendix 5.

[33] Commerce Commission, Consultation Paper (9 July 2014) at [269.1].

Commission, is likely to have a relatively low level of network maintenance costs initially. However, these costs will rise as the network ages. If the Commission determines the base level of operating costs having regard only to the operating costs of a new network, it will undercompensate the efficient new entrant for its costs. That is, if the base operating costs are reset at the beginning of each regulatory period to the operating costs of a new network, a new entrant will not receive compensation for its higher expected operating costs later in the network's life (after the end of the regulatory period). Therefore the Commission should determine the base level of operating costs on an average of operating costs over the life of the assets.

Depreciation

125 Chorus, in response to the UCLL process and issues paper, proposed an adjusted tilted annuity, which included an additional tilt for demand changes. While we are of the view that simple economic deprecation would be superior to a tilted annuity, the adjusted tilted annuity may be an appropriate choice to ensure timely delivery of the model results.

126 We maintain the view that an adjusted tilted annuity remains superior to a tilted annuity because if the Commission does not account for changes in demand then the efficient costs cannot be recovered, and an adjusted tilted annuity ensures that prices are smooth, avoiding a price spiral and enabling recovery of the modelled efficient costs over time.

127 An important input to the (adjusted) tilted annuity calculation is the price trend. The price trend should indicate the rate at which the price is expected to change year-on-year. The price trends can be determined using a cost escalation methodology.

128 In order to achieve expected NPV neutrality over the regulatory period, the input price trends must, in total, reflect the expected change in the replacement cost of the assets over the regulatory period. There are two factors that need to be taken into account to ensure this outcome is achieved – the expected escalation in costs of the MEA being modelled and any effects of a change in the MEA.

129 The Commission should be very careful when setting the depreciation profile so that it does not backload recovery of cost in a way that will make it practically impossible to recover the efficient cost of the network. An aggressively backloaded depreciation profile would imply that the majority of recovery occurs decades into the future. Such recovery cannot be relied on to eventuate, particularly given the current high level of regulatory uncertainty about the post-2020 framework.

Cost escalation

130 Escalation factors, properly derived, can be used to estimate the change in input price (or cost) of the network elements that make up the MEA network.

131 A cost escalation methodology may be adopted in the alternative to reliable, independent forecasts of the future prices of the network elements.[34] For example, there may not be

[34] A cost escalation methodology is use by regulators in other jurisdictions to assist with forecasting capital expenditure over the course of regulatory periods. The discussion below adapts the methodology to a TSLRIC regulatory environment.

reliable forecasts of the cost of network elements such as cabinets, exchange housings, or telecommunications cables.[35]

132 However, reliable forecasts may exist for the raw inputs to construct these network elements. Raw inputs may be wages in the construction sector, aluminium sheeting, fabricated steel and fibre optic cabling. For many of these raw inputs there are raw material futures markets and independent expert forecasts that could be used to inform the forecast of the price of the network elements.

133 These forecasts of price changes for raw materials can be coupled with an assumption of the weighting of materials within each network element to determine the expected change in the input cost of the network element.

134 To implement this methodology, the following steps would be followed:

134.1 Determine whether or not there are reliable, independent and verifiable forecasts for the final network elements within the MEA network over the regulatory period. If these exist they should be used as the input price trends for these network elements. If not;

134.2 Develop an engineering assessment of the raw material inputs into the various network elements. This would include a breakdown of the cost of building the network elements (for example, type of labour (construction, specialist), cable, steel, concrete);

134.3 Source predictions of future prices either in the form of future prices or expert forecasts. For example, future prices and forecasts for copper can be used to inform the forecasts for the value of copper cable. Where futures are available and sufficiently liquid, we propose they be used in favour of forecasts on the basis that these represent the best forecast of prices by informed market participants; and

134.4 Calculate a weighted escalation factor or input price trend using the weights for the raw materials determined in the engineering assessment and the future prices and forecast for the raw materials.

135 This methodology is associated with a high degree of transparency. It also provides a realistic assessment of the likely future costs.

136 A cost escalation methodology should be preferred to benchmarking input price trends from costs models in other jurisdictions. In many cases, the origins on the input price trend in these models are unclear.

Technology change

137 Over time, technological developments can change the cost of producing telecommunications services. In TSLRIC modelling this can be reflected in a change in the MEA used to provide the regulated service.

[35] The lack of independent forecast is not surprising given there are no futures market for such items.

138 In order for the input price trends to achieve NPV neutrality they must include a component that captures expected changes in the MEA. That is, prices for the current MEA need to be set higher today in order to reflect future reductions in prices as the MEA changes.

139 In order to avoid price spikes, the prediction of future changes in the MEA needs to extend beyond the regulatory period. If changes in the MEA are left to the period in which the MEA is expected to change, then prices may need to jump sharply in order to account for the expected change in the MEA.

140 Such price spikes are undesirable and are likely to create a "commitment problem" for regulators. For example, regulators may simply announce that it is too late to compensate fairly for the change in the MEA and not allow an associated uplift in price. Alternatively, they may simply bring forward the change in the MEA. The desire to avoid price spikes is understandable but this behaviour is extremely harmful to investment incentives.

Modelling basis for taxation

141 Chorus considers that some amendments are required to more accurately model the present value of expected tax deductions to the efficient operator.

142 The Commission's proposed modelling of tax costs is aggressive in that it implicitly assumes that 100% of tax deductions for interest and depreciation will be deducted in the year in which they are incurred. This essentially assumes that there is zero probability of the efficient operator ever being in a tax loss position. This may not be reasonable even if the modelled revenues and costs are assumed to be perfect forecasts (zero error bounds) of the actual circumstances an HNE would face.

143 In particular, if revenues are sufficiently back-loaded and tax depreciation is, through the operation of diminishing value depreciation, sufficiently frontloaded it is possible that the efficient operator could be forecast to be in a tax loss situation in year one. In addition, the reality is that an efficient operator faces a positive probability of being in tax loss even if the median forecast (upon which modelled prices are based) is that they will be in a tax paying position.

144 Indeed, elements of the WACC calculation implicitly assume some positive probability of this (such as positive default risk on borrowing, noting that a default is likely to be correlated with both economic and tax losses).

TSLRIC price profile for UBA and UCLL services

145 The Commission suggests that the price be a constant nominal price over the regulatory period. This is a pragmatic proposal which will provide stability over the regulatory period. We assume the Commission proposes to set a flat nominal price such that over the regulatory period it has the same NPV as a tax-adjusted tilted annuity over the same regulatory period. The same approach should be considered for transaction charges.

MAPPING THE LOCAL LOOP COST TO SERVICES

Price smoothing

146 The Consultation Paper sketches out quite a fundamental change in the way that the UCLL and SLU prices are set. Chorus agrees that the Commission is targeting worthwhile outcomes. However, we have a concern with the particular proposal suggested in the Consultation Paper.

147 It is intrinsic to the Commission's proposal that for each of the UCLL STD service and the SLU STD service a price will be set that does not equal the TSLRIC of that service. This outcome is at odds with the requirement of the Act, which is to set a price for the STD service in question equal to the TSLRIC of that service. For this reason we don't think the proposal is consistent with the Act.

148 We summarise in the table below the approach the Commission is required to take when identifying the TSLRIC price of each of the STD services being discussed. We have shown what needs to be done if the Commission uses a copper/FTTN MEA for UCLL and what needs to be done if a FTTH MEA is used.

	If CC UCLL MEA is copper/FTTN	**If CC UCLL MEA is FTTH**
UCLL price	Average TSLRIC of lines that are not cabinetised in Chorus' network	Average TSLRIC of lines that are not cabinetised in Chorus' network
SLU price	Average TSLRIC of SLU lines (i.e. can model directly).	Average TSLRIC of lines that are actually cabinetised in Chorus' network (but won't be in the FTTH model) minus average TSLRIC of fibre feeder from the copper/FTTN model
UBA Base component	Average TSLRIC of all lines, including UCLFS	Average TSLRIC of all lines, including UCFLS
UBA additional costs	Items listed in Chorus' previous submission, including average TSLRIC of fibre feeder	Items listed in Chorus' previous submission, including average TSLRIC of fibre feeder

149 Our expectations are:

149.1 The average TSLRIC of SLU lines is approximately equal to the average TSLRIC of NC UCLL. Chorus' network data indicates that in 2012 the average trench length per customer for SLU was *longer* than the average trench length per customer for UCLL. Our expectation is that this difference is likely to be balanced out by relative unit costs of trenching in different geographical areas, so that the costs for the two services are likely to be approximately equal; and

149.2 The UCLFS price will be higher than the UCLL / SLU price (because it includes the cost of the copper feeder). The UCLFS (copper baseband service) is regulated and the copper feeder cannot be ignored in a replacement forward-looking TSLRIC model.

Double recovery concerns

150 As we understand the Consultation Paper and the TERA Report, the Commission and TERA agree with the approach described above for the UBA Base component and the UBA additional costs.

151 However the Commission and TERA propose a further step of "deduct double recovery". TERA's view is that the costs of the fibre feeder between exchange and the cabinet are counted twice in the statutory formula for the UBA price when they should not be, and proposes that deduction should be made.[36]

152 We do not think TERA has identified double counting, and therefore an adjustment is not required. In our view:

152.1 The intention is that the UBA price recovers the cost of the copper feeder and fibre feeder (i.e. two lots of feeder trenching costs);

152.2 The Act is written so that this outcome is reached at both the IPP and FPP stage;

152.3 In other words, this is the status quo. The benchmarked UCLL price is "all loops" and the UBA increment reflects the benchmarking of all additional costs;

152.4 At the FPP stage the words used in the Act also drive that outcome. The UBA base component is defined to include the full copper local loop network; and

152.5 This is consistent with the policy change in 2011 that the UBA prices is the primary vehicle for recovering the cost of the copper line (and the previous concepts of clothed and naked UBA of clothed and naked UBA disappear).

153 This is consistent with the concept of a UBA HNE. The UBA HNE will:

153.1 Be charged by the copper local loop incumbent for use of the copper line (i.e. the copper local loop incumbent will only agree to access if it can recover its investment); and

[36] TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 74.

153.2 Incur the additional costs of installing the fibre feeder.

154 Analysys Mason advises:[37]

> TERA proposes to eliminate "double recovery" of the fibre feeder to DSLAMs located in cabinets.
>
> > *If UCLL and UBA do not have the same MEA, double recovery should be identified and removed. The identification of the double recovery will be conducted by comparing the network architectures and footprints in both cases (UCLL and UBA) to identify overlaps. In particular, if fibre is chosen for UCLL and copper/FTTN for UBA, then the core network UBA cost should be reduced by the amount of the network between the MDF and the active cabinet, for those areas where MDFs are cabinetised.*
>
> This apparent double recovery is not real, and does not need to be removed. The reason the Commission has selected a different MEA for UBA (Ethernet-based DSL on copper) is that:
>
> > *…for the UBA service, the existing copper network must be taken as a given, and the TSLRIC and MEA principles only be applied in relation to the facilities associated with the "additional costs".*
>
> The UCLL copper network that is a "given" does not have a fibre feeder, so there is no double recovery.
>
> A competing operator choosing to build its own cabinet DSLAMs will buy SLU and will need to either build fibre to the cabinet or buy sub-loop backhaul. As the Commission states:
>
> > *We also note that for unbundlers, the decision of whether to unbundle is based on the costs of Chorus' existing copper network, not a fibre network.*
>
> An unbundler faces a "build or buy" decision in relation to construction of a fibre to the cabinet. Disregarding the fibre to the cabinet costs (by claiming that they are "double recovery") will distort this decision, and distort investment incentives.

155 For these reasons it is clear that both feeder trenching costs were included by the legislative drafters in the UBA price formula.

[37] Analysys Mason, Response to July Consultation (6 August 2014) at [1.10].

TRANSACTION CHARGES

156 The applications for price review made by Chorus and its customers include review of a number of transaction, or one-off, charges. The relevant transaction charges are identified in Appendix 4.

Consultation required

157 These charges are important both to Chorus and RSPs. The Commission has not yet indicated how it intends to deal with these charges in the price review context.

158 We are conscious that this area involves engaging with a certain amount of detail as to the activities involved and the costs incurred. We are concerned that if these matters are first addressed in the 1 December 2014 draft determination, along with all of the other issues that the draft determination will cover, that there will not be time to work through the issues to the satisfaction of all parties.

159 For this reason we request that the Commission consult on these charges prior to the release of the 1 December 2014 draft determination. This consultation can be run alongside TERA's modelling without delaying that activity.

160 The consultation on transaction changes could address the following matters.

Starting principles

161 Some starting principles are that the charges set by the Commission should reflect:

161.1 The activity that Chorus or its service company performs in response to RSP activity (whether that activity from RSPs is efficient or inefficient); and

161.2 There is nowhere for under recovery of costs to be absorbed in a structurally separated environment with a cost-based pricing approach.

Relevant activity

162 The Commission should not assume that the current charging structure in the STDs accurately reflects all of the activity undertaken by Chorus or a service company, for which compensation is warranted.

163 An example of an activity that has "fallen between the cracks" during the IPP process and is currently proposed to be performed without compensation is the connection activity that occurs when an RSP orders both UBA and UCLFS on the same line at the same time. In addition, the correct POA charge for UBA wiring is difficult to implement and could lead to uncertainty for RSPs and end users.

164 The consultation process will be an opportunity to identify where the charges set at the IPP stage do not match the activity being undertaken in practice.

Our service company contracts

165 As the Commission is aware, a significant aspect of Chorus' costs is represented by the charges Chorus faces under contracts with service companies. They will be a material part of any bottom-up modelling of transaction charges.

166 These service company contracts are the result of a competitive tender process. Chorus had a significant interest in the outcome of the tender, as the prices charged by service companies are not just for responding to RSP orders but also business inputs Chorus consumes. In other words, the prices are not, from Chorus' perspective, simply a pass through cost.

Modelling transaction charges

167 There are two potential approaches that the Commission could adopt in calculating the cost-based transaction charge:

167.1 Use the service company charges as inputs with appropriate margin to cover overheads; or

167.2 Model the time and materials an overhead costs of the relevant activities on a more granular basis.

Service company inputs with appropriate margin to cover overheads

168 Our suggestion is that the Commission set the transaction charges based on the prices that the service companies charge Chorus, with an appropriate margin for Chorus internal costs. This approach is the simplest and most reflective of reality.

169 As noted above, the prices that the service companies charge Chorus were set at arm's-length via a nationwide competitive tender. It follows that it is appropriate to treat these competitively sourced contractor prices as an input to a bottom-up model of transaction charges (in much the same way as the competitively sourced vendor price of a DSLAM is treated as an input to a bottom-up model of monthly charges). We would not expect the charges we face to be any different to those the service companies would charge an HNE.

170 We note that this methodology has been adopted in setting the price of some of the sundry prices in the STDs, with mechanisms for adjustment where there are changes, for example in labour costs and service company charges.

Alternative modelling approach

171 An alternative approach to using the service company contracts would be for the Commission to build a bottom-up calculation of costs based on industry views of the likely time taken for each activity (the bulk of the cost is labour).

172 This is complicated by the fact that no two tasks are the same as different locations are involved, such as different travel times, labour rates, etc. This would be a complex and time consuming task. Analysys Mason estimates that modelling the transaction charges this way would take an estimated 8-10 weeks, not including consultation time. For this reason we prefer using the service company charges directly, as explained above.

Cost escalation

173 In addition to establishing the appropriate transaction charges for the HNE, the Commission also needs to form a view as to how these costs might change over the course of the regulatory period. We propose the Commission do this using the cost escalation methodology proposed in this submission in relation to both price trends and operating expenditure.

TIMING DECISIONS

Regulatory period

175 The Commission is required to specify an end date for its price review decision. Our view is that the Commission should determine prices that apply through to 2020 at a minimum. This will provide stability during a period of significant investment and also aligns with the period for regulatory review.

176 From our perspective, the two phase price setting process to date has had a destabilising effect on Chorus, probably greater than the impact on other entities that the Commission is regulating. This is a combination of the fact that we are making large investment commitments that make us sensitive to changes in revenues, and the Commission is regulating our primary sources of revenue. For these reasons, we would prefer a reasonable period of price stability so that we can focus on the roll out of our upgraded UFB infrastructure and assisting our customers in the initial migration to those services.

177 Completing a review of prices every five years in reality means starting the process at least two years before then. The prospect of a review starting again three years from now seems to us not the best balance between regulatory and pricing stability, and the desirability of checking prices continue to reflect efficient costs.

178 A further consideration is the Government review of the legislative framework to consider the post 2020 framework. Industry attention should be focused on that.

179 Considering what the industry has in front of it, we request that the Commission consider a regulatory period longer than five years. We have previously suggested 10 years. Even a compromise of seven years would mean the Commission and the industry would be reviewing the TSLRIC model and inputs with the benefit of knowing how the Government review and the termination of the UFB contracts had influenced the regulatory framework and markets.

Backdating

180 In our view the Commission should inform the industry now that its decisions will be backdated. From a commercial (and investor) perspective, the idea of a wash-up is ordinary practice. And the idea that such a wash-up would be reciprocal is a given.

181 Bringing that commercial common-sense into a regulatory context, the perspective of investors is:

181.1 Chorus is required to sell its services at prices set by the Commission;

181.2 After the initial price is set, a further regulatory process may reveal a more accurate price;

181.3 In the meantime, Chorus will have been selling its services at the initial, less accurate price set by the Commission;

181.4 It makes sense that a wash-up occur once the more accurate price is known.

182 The Commission has rightly emphasised the importance of considering investor expectations and maintaining incentives to invest:[38]

> A decision that undermines incentives to invest is likely to undermine competition over the long run, as it would deter future investment, and consequently would not be for the long-term benefit of end-users.

183 We agree with the importance of considering investor expectations. Section 18 emphasises that the Commission is required to consider "incentives to innovate that exist for, and the risks faced by, investors". In general, investor confidence is important for the long-term interests of end users.

184 Investors will consider it to be reasonable and fair that there be a wash up of amounts charged based on an inaccurate initial price, to reflect the final price. RSPs are aware of the Court of Appeal decision and the precedent for backdating.[39]

185 Investors will also have expectations as to symmetry of risk during the price review process. Chorus and RSPs will both be expected to have taken into account that the price was under review. Backdating should occur whether the final price is higher or lower than the initial price.

186 The Court of Appeal puts substantial emphasis on the nature of the FPP as a "substitutionary" pricing review - which therefore reviews and replaces the IPP price, rather than simply changing the price in a forward-looking sense. This is in line with how investors will consider the current pricing review determinations.

Efficiencies of backdating

187 If the Commission considers that it has discretion to backdate (or not), it should adopt backdating as a 'policy' in all but exceptional circumstances. This policy would promote certainty for Chorus as the service provider and for RSPs in making efficient pricing, entry and investment decisions. In doing so, it is consistent with the objectives in section 18.

188 A policy of backdating has positive effects for both Chorus and RSPs. While there may be perceived negative effects for RSPs, on balance, efficiency considerations point to adopting a policy of backdating:

188.1 ***For Chorus***, backdating allows it to recover the efficient costs of providing the regulated service. A policy of not backdating in the case of a price increase would not allow Chorus to recover its efficient costs (and in the case of a price reduction it would provide it with an unintended windfall).

188.2 It should be noted that, as a wholesale-only entity, Chorus has no other avenues through which it may recover these costs. It would be inconsistent with Chorus' legitimate expectation that it can recover efficient cost not to backdate. Over

[38] Commerce Commission, Consultation Paper (9 July 2014) at [59].

[39] See John Land *The Chorus decision and the approach to telecommunications regulation* LawTalk 845, 4 July 2014 at 30-31.

time, a policy of discretionary backdating would be harmful to the incentive to invest efficiently in the sector.

188.3 ***For RSPs***, the knowledge that backdating will occur will ensure they make efficient entry and pricing decisions based on their best expectations of the efficient costs. In the current circumstances where there is uncertainty whether the Commission will backdate, RSPs should still be factoring these expectations into their prices. This will not change if a policy of backdating is adopted.

188.4 It should be noted that basing prices on expected costs is normal practice for businesses and the competitive forces operating in the market will ensure that reasonable expectations will be reflected in the market. This stands in contrast to Chorus' position. It cannot reflect any expected change of prices in its revenues as they are predominantly set (or indirectly constrained) by the Commission's STDs.

188.5 While a policy of not backdating would remove the uncertainty for RSPs in terms of their pricing, it would create incentives for them to delay efficient investment decisions. For example, RSPs may otherwise delay transitioning to UFB if they believe they can capture some of the gains from temporarily lower than efficient prices for the UCLL.

189 Another key reason for adopting a policy of backdating is to improve the timeliness of decision making. In a process without strictly legislated timeframes, a policy of backdating will ensure that all parties have an incentive to engage in the FPP process in a timely manner. By way of contrast, a policy of not backdating creates incentives for parties to delay outcomes that they expect not to be in their favour. While the Commission is largely in control of the required timeframes, we have already had submissions from parties to slow down the timetable proposed by the Commission (see Telecom letter to the Commission of 4 December 2013).

190 Chorus believes that, following the Court of Appeal decision in *Telecom New Zealand*, parties would expect backdating to occur (this appears to be agreed in submission), and accordingly the parties arguing against backdating now are behaving opportunistically. For the above reasons, this behaviour is harmful to the objective of regulation and section 18, and Chorus considers that the Commission should move quickly to announce a policy of backdating.

Customer engagement to manage the impacts of backdating

191 Mechanisms which mitigate the impacts of repayments on parties are common in the commercial world, especially as between suppliers and customers. These mechanisms are straightforward to apply and administer. They can be structured for both small and large customers and repayments.

192 We will be engaging with our customers on reciprocal commercial options for implementing backdating with minimal impacts on our businesses. We are open to exploring all reasonable proposals which allow Chorus and its customers to prepare commercially for unknown outcomes from the final determination.

193 We intend to keep the Commission informed of progress on these proposals in advance of the issuing of the draft determination, and are happy to take guidance from the Commission.

194 We note that the Commission is able to set terms and conditions in its determinations (under section 52(d) of the Act) which could include mechanisms for backdating.

Appendices

APPENDIX 1: REGULATORY FRAMEWORK

Section 18

195 Chorus agrees with the Commission's explanation of the section 18 purpose statement:

195.1 The Commission's purpose in making determinations is first and foremost to promote competition in telecommunications markets for the long-term benefit of end users of telecommunications services in New Zealand;[40]

195.2 Subsections 18(2) and 18(2A) assist the Commission's analysis under subsection 18(1);[41]

195.3 Subsection 18(2A) reinforces the emphasis on dynamic efficiencies. Dynamic efficiencies are concerned with new and innovative products and services, or existing ones at better quality, which leads over the long-term to greater consumer choices and benefits. They are therefore a significant factor in promoting competition;[42] and

195.4 A decision that undermines incentives to invest is likely to undermine competition over the long run, as it would deter future investment, and consequently would not be for the long-term benefit of end users.[43]

196 When applying section 18, the Commission has rightly emphasised that regulation should be predictable and reasonable investor expectations should be respected.[44]

197 We view the Commission's statements at paragraph 80 of the Consultation Paper as important ones for the regulatory regime:

> …we have decided that to help build predictability in regulation, we will respect what we see as reasonable investor expectations in relation to major telecommunications infrastructure. The link to section 18 is that predictability supports investment, and investment promotes competition for the long-term benefit of end-users.

198 For this reason, the Commission rightly rejects suggestions that it assume re-use by the HNE of Chorus' assets, and suggestions that it make capability-based performance adjustments to the valuation of the modelled FTTH network. We discuss these specific topics further below.

199 The Commission also highlights that the positive externalities and efficiencies that will result from the migration to upgraded UFB infrastructure are relevant to the section 18

[40] Commerce Commission, Consultation Paper (9 July 2014) at [56].

[41] Commerce Commission, Consultation Paper (9 July 2014) at [57], referring to *Chorus v Commerce Commission* [2014] NZHC 690 at [34].

[42] Commerce Commission, Consultation Paper (9 July 2014) at [58].

[43] Commerce Commission, Consultation Paper (9 July 2014) at [59].

[44] This is consistent with previous statements that "*In considering the long term benefit of end-users, the Commission has regard to economic efficiency, including the need for investors to obtain a reasonable return on investment…*" (Public letter to Bryan Gaynor, dated 28 March 2012).

assessment, and count against adopting new and unconventional changes to the TSLRIC methodology that would result in lower prices.[45] We agree with that approach.

200 Where we may disagree with the Commission is in relation to the scope for basing decisions on section 18 when applying the final pricing principle.

201 The Commission quotes the comments of Justice Kos that statutes providing for economic regulation "present a chart of medium scale at best". However the Commission does not specify what it takes from that observation.[46]

202 It does not follow from that high level observation about economic regulation generally that in the TSLRIC context specifically the Commission has discretion at every step. It is important not to assume or overstate the scope for discretion. As we have previously submitted, some important modelling decisions are made plain in the Act (and section 18 is therefore not relevant), for example:

202.1 The Commission is required to identify the TSLRIC costs of delivering the full functionality of the service;

202.2 The MEA must deliver the full functionality of the service; and

202.3 "Forward-looking costs" rules out historic cost approaches.

203 Subject to those areas where the Act has specified an approach, we agree with the Commission that section 18 assists the Commission with its overall assessment of the determination, and provides guidance at a number of decision points including:

203.1 Model design and approach;

203.2 The determination or selection of individual parameters in the cost modelling exercise; and

203.3 Selecting a price within any relevant range provided by the modelling.[47]

204 The Commission asked Professor Vogelsang to prepare a report on whether an increase in the regulated UCLL price would promote competition between networks for the long-term benefit of end users (**LTBEU**). A great deal of Professor Vogelsang's report is spent examining the likely effects of a UCLL price increase on near-term consumer welfare. CEG describes Professor Vogelsang's approach and conclusions in the following way:[48]

> Much of Professor Vogelsang's report comprises a detailed description of what might happen if the UCLL price increased. At the end of that exposition, Professor Vogelsang concludes that, because end-users of copper and substitute services are likely to face higher prices (which may not be off-

[45] Commerce Commission, Consultation Paper (9 July 2014) at [86].

[46] Commerce Commission, Consultation Paper (9 July 2014) at [60].

[47] Commerce Commission, Consultation Paper (9 July 2014) at [65].

[48] CEG "Promoting competition: review of Vogelsang" (August 2014) at page 3.

> set by higher quality), that is not in their long-term interest. However, Professor Vogelsang does not link these price effects to any other competitive impacts that, in our view, are required in assessing whether the UCLL price increase would "promote competition".
>
> Instead, Professor Vogelsang assumes that anything that leads to higher prices for consumers will, all other things being equal, not "promote competition for the LTBEU". In our opinion, that does not represent an economically robust interpretation of the relevant objective. To see why, one need only recognise that Professor Vogelsang's framework would never conclude that a higher access price would promote competition for the LTBEU.

205 In other words, Professor Vogelsang concludes that if an increase in the price of a regulated service will result in higher prices for end users and this reduces near-term consumer welfare (two outcomes that will invariably follow any increase in a regulated price), then this will not promote competition for the LTBEU. We agree with CEG that, in order to determine whether a price increase will promote competition for the LTBEU it is necessary to look beyond a narrow assessment of consumer welfare before and after the price increase. It is necessary to understand the effect of the price rise on the conditions and environment for rivalry amongst firms, relative to the situation that would exist if the price did not increase.

206 Taking this wider view, CEG concludes that a higher UCLL price would improve the conditions and environment for competition amongst firms for the LTBEU, consistent with the statutory objective. Specifically, CEG notes that:[49]

> In our opinion, an increase in the UCLL price could potentially have some negative effects for competition between the RSPs on the copper network and other networks. However, any such effects are likely to be more than offset by two key factors that suggest that a higher UCLL price would indeed promote the relevant statutory objective; namely:
>
> - a higher UCLL price would be likely to make Telecom less inclined to widely unbundle which, if it was to occur, would be likely to result in the inefficient duplication of infrastructure without sufficient offsetting benefits in terms of improved product differentiation or market growth; and
>
> - the fact that higher UCLL prices can be expected to hasten migration to UFB – a platform upon which scale advantages are less important to RSPs relative to the copper network, and on which competition may therefore be less susceptible to distortions through differences in the size of operators.

Relativity

207 We agree with the Commission's explanation of the role the relativity consideration plays in a price review process:[50]

> Relativity is a mandatory consideration in its own right under the Act; it is not enough simply for us to adopt TSLRIC pricing. For example, we agree that, if the SLU and UCLL prices continue to

[49] CEG "Promoting competition: review of Vogelsang" (August 2014) at page 6.

[50] Commerce Commission, Consultation Paper (9 July 2014) at [74].

> differ as a result of the pricing review determinations, we will need to consider the different relativities that result, in terms of our application of section 18.

208 In relation to the content of the relativity consideration, the Commission discusses whether it should actively promote the ladder of investment. The Commission observes that in current markets:[51]

208.1 Access seekers' incentives to invest in local loop services are a product of more than just unbundling;

208.2 In particular, the migration to the UFB services is affecting access seekers' intentions; and

208.3 This means that any attempt to provide an incentive to unbundle via a higher UBA price may not result in any further unbundling but will result in end users paying more.

209 Because of this, we agree with the precautionary stance of the Commission that:[52]

> … section 18, and relativity, is best met for UBA by a position of competitive neutrality in respect of unbundling. The UBA price (and the method by which this is constructed under a TSLRIC model) should not independently incentivise or disincentivise unbundling.

210 We believe the Commission has the right focus when it says:[53]

> Our preliminary view is, therefore, that the relativity consideration guides us less towards attempting to promote further investment in the form of unbundling, and more towards the efficiency aspect of the section 18 purpose.

211 As noted by CEG,[54] Vogelsang advises that the expansion of market share on UFB and other networks resulting from a higher UCLL price will result in "innovation effects" that will be of benefit to end users. While Vogelsang also identifies negative externality effects on users of copper-based services from a migration to fibre, he concludes that the net effect is positive. The positive network externality effects of a UCLL price increase for UFB subscribers are likely to exceed the negative externalities imposed on the remaining subscribers of the copper-based services.

TSLRIC

212 The Commission states "the essential feature of TSLRIC is that it sets prices based on a replacement cost".[55] We agree, and Analysys Mason agrees, that is essential to identifying a forward-looking cost, as required by the Act.[56]

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[51] Commerce Commission, Consultation Paper (9 July 2014) at [77].

[52] Commerce Commission, Consultation Paper (9 July 2014) at [88].

[53] Commerce Commission, Consultation Paper (9 July 2014) at [79].

[54] CEG, "Promoting competition: review of Vogelsang" (August 2014) at [5].

[55] Commerce Commission, Consultation Paper (9 July 2014) at [109].

213 The Commission then identifies two TSLRIC objectives that it will apply to both the UCLL and UBA services. The first is investment efficiency, which the Consultation Paper explains has the following aspects:

213.1 It applies to both unbundling (the relativity consideration) and enabling Chorus to continue to invest in the copper network;[57]

213.2 A common theme internationally, and in the Commission's approach to TSLRIC published in 2004, is the ability of a TSLRIC price to incentivise efficient build or buy choices;[58]

213.3 The intention is that an access seeker who has access to more efficient alternatives will choose to build such an alternative rather than purchase the regulated access product. Likewise, where an access seeker is not more efficient it will purchase the regulated product, preventing inefficient duplication of assets;[59] and

213.4 Incentivising efficient build or buy choices sits comfortably with the section 18 purpose of promoting competition, which could include investment in alternative infrastructure, for the long-term benefit of end users.[60]

214 The second objective is predictability. This has the following aspects:

214.1 The Commission should respect reasonable investor expectations, to promote investment, therefore competition for the long-term benefit of end users;[61]

214.2 As this is the first implementation of TSLRIC the Commission is not in a position to maintain consistency with previous decisions but in 2004 it informed the market as to its approach to TSLRIC;[62] and

214.3 The best contribution to building predictability will be by respecting reasonable investor expectations (while noting that the regulatory environment might change over time).

215 We agree with these objectives, which in our view flow from the section 18 statement of statutory purpose and the intention that the TSLRIC price identify the forward-looking costs of the service.

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[56] Analysys Mason, Response to July Consultation (6 August 2014) at [1.2].

[57] Commerce Commission, Consultation Paper (9 July 2014) at [110.1].

[58] Commerce Commission, Consultation Paper (9 July 2014) at [112].

[59] Commerce Commission, Consultation Paper (9 July 2014) at [113].

[60] Commerce Commission, Consultation Paper (9 July 2014) at [116].

[61] Commerce Commission, Consultation Paper (9 July 2014) at [110.2].

[62] Commerce Commission, Consultation Paper (9 July 2014) at [119]. The Commission has previously created a TSLRIC cost model for interconnection, which was delivered in draft form.

216 In particular, the Commission is right to emphasise regulatory predictability. In this first implementation of TSLRIC it is important that the Commission adopts a conventional approach and is consistent with the information it gave to the market in 2004. A long-term reputation for regulatory predictability will enhance investment incentives, which will directly promote competition for the long-term benefit of end users.

217 In framing the HNE for modelling purposes, the Commission should ensure that the HNE is grounded in real world New Zealand conditions and faces the legal obligations and constraints currently facing Chorus and other service providers operating in the New Zealand market. Any scenario in which a network operator serving 100% of demand in New Zealand could operate without being subject to appropriate legal obligations and constraints would not be realistic.

218 Setting prices based on the perceived costs of a feasible HNE (and not an unrealistically efficient new entrant), will encourage efficient build/buy decisions in that it discourages inefficient duplication of infrastructure. Taking into account real-life operational aspects is also consistent with precedent from regulators in other jurisdictions. A few examples of this are outlined below.

219 The Belgian regulator BIPT notes that:[63]

> A bottom up model is necessary for transparency, objectivity and to facilitate industry consultation. The incorporation of top-down checks and validation improve the robustness of the model results, ensuring that (to the extent necessary) the model reflects the real-life operational aspects.

220 The Swedish regulator, PTS, notes that the hybrid model it uses represents a balanced view on what it would cost for an efficient operator of TeliaSonera's size to build and run a network today. PTS comments that:[64]

> Thus the assumptions take account of both those within the bottom up model, which are by necessity somewhat theoretical, and those in the top down model, that encompass some of the realities of TeliaSonera's actual network.

221 The Irish regulator, Comreg, notes that it carries out physical site visits and compares the copper access network infrastructure as it is currently deployed with the BU-LRIC cost model, in order to understand actual deployment decisions and to ensure that the model was reasonable and consistent with the infrastructure in place on the ground. They note that:[65]

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[63] Belgian Institute for Postal services and Telecommunications "Consultation document for the draft NGN/NGA models" (23 December 2011) at page 6.

[64] Swedish Post and Telecom Authority "Draft Model Reference Paper Guidelines for the LRIC bottom-up and top-down models" (4 February 2010) at page 2.

[65] Commission for Communications Regulation "Response to Consultations and Final Decision: Local Loop Unbundling and Subloop Unbundling Maximum Monthly Rental Charges" (9 February 2010) at pages 19 – 20 (**Response to Consultations and Final Decision**).

> This "reality check" exercise was carried out at a national level and also at a local level for a number of selected sites.

222 and that the Comreg process:[66]

> …ensures that the model retains an appropriate degree of realism.

Modern equivalent asset for the UCLL service

Conventional approach

223 Consistent with its focus on a conventional application of TSLRIC, the selection of the MEA for the UCLL model should involve the following steps:

223.1 First, the service being priced is identified; and then

223.2 Second, an appropriate MEA is selected, which must be capable of providing that pre-defined service.[67]

224 The Commission has done something fundamentally different. The Commission has identified which technology it considers to be "modern" and then identified the "core" functionality which the MEA is capable of providing.

225 As a result, the Consultation Paper proposes to model a FTTH / FWA network as the UCLL MEA. This gives rise to some fundamental problems with the model. Specifically:[68]

225.1 A FTTH network cannot support all of the services that RSPs sell, and end users rely on, on the current UCLL platform without various "fixes"; and

225.2 A FWA network simply cannot replicate for RSPs and end users what they receive on the UCLL platform.

226 These failings are not trivial. Without fixes FTTH cannot supply services which are valued by customers, and will render many end users' devices unsupported. FWA simply cannot do what UCLL does (in particular it is not a layer 1 service and one end user's connection may interfere with another's).

227 If the Commission proceeds with modelling a FTTH and FWA network:

227.1 The functionality shortfalls of FTTH can be fixed, but the cost of those fixes must be included in the model, as the purpose of the exercise is to determine the efficient cost of replicating the UCLL service;

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[66] Commission for Communications Regulation, Response to Consultations and Final Decision (9 February 2010) at page 11.

[67] See Analysys Mason, Response to July Consultation (6 August 2014) at [1.4].

[68] Although the Commission does not discuss the issue in the Consultation Paper, we assume that where the Commission refers to FTTH it is referring to a P2P network. As we have previously explained, GPON cannot be unbundled on a per-user basis (i.e. in a manner consistent with the UCLL service) and therefore cannot provide UCLL functionality (core or full).

227.2 The functionality shortfalls of FWA cannot be cured. Where the Consultation Paper currently proposes FWA it should model FTTH (with fixes). If the Commission nevertheless models FWA, it should model the cost of FWA infrastructure that serves 100% of end users, with certainty, in the coverage area. This is much more costly than a standard mobile network that tolerates less than 100% certain coverage.

228 In Appendix 2 we expand on the important functionality of the UCLL STD service and indicate how modelling the service should occur.

Legal advice

229 As we have previously noted, and as outlined in Chapman Tripp's opinion attached to Chorus' April submission:[69]

229.1 "The TSLRIC FPP is defined… in terms of "forward-looking costs" and plainly contemplates and permits analysis of technologies other than those actually deployed by the current access provider, **but** the definition and concept of TSLRIC cannot dictate the description or scope of the "service" to which the PRD will apply."

229.2 "The Act reflects a legislative intent or expectation that, at the time of a PRD, access seekers would already be utilising the designated access service… and have reflected and relied on aspects of the functionality of that (described) service in their own (retail) services."

229.3 "Conversely, while there may well be some "abstraction" of service functionality involved in TSLRIC analysis, it cannot have been a legislative intent that the service to be the subject of the PRD exercise would be one which (in the relevant hypothesis) was inconsistent with, or assumed away, such functionality."

Clarification of points

230 The Commission has provided updated reasoning on its opinion that its role is to model only the "core functionality" of the UCLL and SLU services. These reasons have not changed our view.

Relevance of Chorus' network

231 The Commission paraphrases Chorus as arguing that the Commission is required to model the functionality of its existing network:

> To the extent that it invites us to model its actual network, Chorus' approach would unduly restrict the optimisation and expert judgment that TSLRIC involves. We do not consider that this interpretation is supported by the Act. [70]

and

[69] Chapman Tripp "Memorandum: Unbundled copper local loop (UCLL) and unbundled bitstream (UBA) access services – pricing review determination (PRDs) – legal framework" (11 April 2014) at page 5 (**Chapman Tripp Memorandum**).

[70] Commerce Commission, Consultation Paper (9 July 2014) at [152].

> Accordingly, in our view TSLRIC does not require us to be constrained in our modelling choices by Chorus' existing network.[71]

232 Chorus is not arguing that the Commission is constrained by Chorus' existing network. Rather, the Commission is constrained by the STD service which is purchased by RSPs and relied upon by New Zealand consumers and markets, and which the HNE's network must also support. After identifying the service to be modelled, we have said:[72]

> There are two ways to address the functionality shortfall of a P2P fibre network when modelling the TSLRIC price of the UCLL and SLU STD services:
>
> 92.1 Model a copper network; or
>
> 92.2 Use a fibre P2P MEA, and include in the TSLRIC model the cost of measures which enable fibre to provide the functionality of the UCLL service.

233 As we have previously explained, one solution is modelling a P2P FTTH network including fixes for functionality shortfalls.[73]

234 A second solution is modelling a copper network.[74]

235 In the event that the Commission models a copper network, we have explained that the copper network which the Commission models should be optimised:[75]

> Modelling the STD service and using a copper MEA does not preclude optimisation, a concern raised by Dr Every-Palmer. A copper MEA would require effectively the same level of optimisation considerations as implied by a fibre MEA, implemented through optimising aspects such as:
>
> 81.1 The distance between the node and the customer premises;
>
> 81.2 Dimensioning of network segments;
>
> 81.3 The degree of aerial deployment;
>
> 81.4 Manhole spacing; and

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71 Commerce Commission, Consultation Paper (9 July 2014) at [104].

72 Chorus "Submission on further consultation paper for UCLL and UBA FPPs" (11 April 2014) at [92].

73 See: Chorus "Submission on UCLL FPP process and issues paper" (14 February 2014) at [103] – [108]; Chorus "Submission on further consultation paper for UCLL and UBA FPPs" (11 April 2014) at [19], [87] to [97]; and Chorus "Cross-submission on UCLL and UBA further consultation paper (30 April 2014) at [5.3].

74 See: Chorus "Submission on UCLL FPP process and issues paper" (14 February 2014) at [2.3] and [73]; Chorus "Cross-submission on UCLL FPP process and issues paper" (28 February 2014) at [23]; Chorus "Submission on further consultation paper for UCLL and UBA FPPs" (11 April 2014) at [2.2], [14], [80]; and Chorus "Cross-submission on UCLL and UBA further consultation paper (30 April 2014) at [5.2].

75 Chorus "Submission on further consultation paper for UCLL and UBA FPPs" (11 April 2014) at [81]. See also: Chorus "Submission on UCLL FPP process and issues paper" (14 February 2014) at [215]; and Chorus "Cross-submission on UCLL FPP process and issues paper" (28 February 2014) at [54].

> 81.5 Assumption of modern trenching techniques rather than those used in the past for both copper and fibre.

236 To the extent that we have mentioned Chorus' actual network, we have done so in the context that actual network data is a useful proxy and starting point for the Commission to model an HNE network.

237 The levels of optimisation that we have argued for are consistent with the level of optimisation and efficiency usually applied in TSLRIC modelling.[76]

Relevance of the TSO

238 We have explained that the TSO is evidence of what is expected by RSPs and end users on the UCLL platform. To be clear, this is not an assertion of Chorus' actual network being relevant. However the TSO gives good examples of services which must be supported by an HNE on its network.

239 The TSO evidences the importance of more functionality than just faxes and alarms. Telecom relies on the Chorus copper TSO service to be able to meet its TSO commitment to deliver the local residential voice and dial up data services (which includes facsimile calls and dial-up internet), including general quality requirements.[77]

240 The TSO is one of the key obligations that an HNE will inherit. The HNE essentially steps into Chorus' shoes and becomes the network operator. Any scenario in which there is no network TSO operating in New Zealand would be unrealistic and the Commission cannot assume away the important ability of RSPs to comply with the TSO.[78] Rather, the model must be adjusted so that the cost of replacing Chorus as the TSO network, supporting the services that Telecom and end users currently rely on, is captured.

241 The HNE inheriting the TSO and other network operator obligations is an important part of TSLRIC approaches applied overseas. For example:

241.1 The 2010/2011 upgrade to the NITA LRAIC model – Final Model Reference Paper identifies the relevance of the USO in Denmark to the modelling process:[79]

> The starting point when building the revised hybrid model for the copper deployment is the level of demand in Denmark for all the services using the access and the core network of an SMP operator with a Universal Service Obligation along with an allowance for growth.

[76] See, for example: TERA "Modification and development of the LRAIC model for fixed networks 2012-2014 in Denmark – Draft Model Reference Paper" (May 2013) at page 56; and Chorus "Submission on UCLL FPP process and issues paper" (14 February 2014) at [217].

[77] Chorus "Submission on UCLL FPP process and issues paper" (14 February 2014) at [46].

[78] Chapman Tripp Memorandum (11 April 2014) at page 5.

[79] Analysys Mason for National IT and Telecom Agency "2010/2011 upgrades to the NITA LRAIC model: Final Model Reference Paper" (6 September 2011) at page 31.

241.2 In determining the scope of the access network model, the Norwegian regulator identifies the scope of the USO, which Telenor is designated to provide.[80]

241.3 In Brazil, Anatel's strict USO coverage obligations were implicitly taken into account in the model of the fixed core and access network due to the input data used.

241.4 In modelling the access network in Australia, Analysys Mason for the ACCC modelled all addresses in the G-NAF database, effectively modelling every residential or business building.

241.5 In the case of mobile interconnection modelling, most European models take coverage obligations into account implicitly by calibrating the coverage level of actual operators.

Conventional TSLRIC approach

242 The Commission makes the point that Parliament intended a conventional TSLRIC exercise:[81]

> Our view, consistent with other submitters, is that Parliament intended us to undertake a more conventional TSLRIC exercise, by building a TSLRIC cost model to determine the costs incurred by a hypothetical operator using the most efficient means at any point in time to provide the service.

243 We agree. Conventional TSLRIC modelling is undertaken in two steps:

243.1 First, identify the service being modelled.

243.2 Second, identify how that service would be most efficiently supplied by an HNE – including by determining the MEA and optimising the network which is modelled.

244 Analysys Mason agrees that a conventional TSLIRC approach is to is first define the service that is being provided before selecting the MEA:[82]

> The Commission's approach appears to be to seek an MEA capable of providing the service at the lowest cost. Defining the service to be provided - in the Commission's terms, defining this "core functionality" - is therefore critically important to the Commission's approach in selecting the MEA.
>
> The correct approach would be to define the service to be offered before selecting the most cost effective technology to deliver that service (the MEA). This is directly supported by the Dr Every-Palmer quotation given by the Commission at paragraph 99:

[80] NPT "Conceptual approach for the LRIC model for fixed networks: Final model specification" (11 February 2010) at page 44.

[81] Commerce Commission, Consultation Paper (9 July 2014) at [103].

[82] Analysys Mason, Response to July Consultation (6 August 2014) at 1.4.

a. My understanding is that TSLRIC models attempt to determine "the costs that would be incurred by an operator using the most efficient means at any point in time to provide the service…"

245 It is not appropriate to assess the "modern equivalents" of the core functionality of the STD services as in, for example, paragraph 157:[83]

> Although existing fax services will not work over most VOIP codecs (coder-decoders), the modern equivalent of a facsimile is an email attachment.

246 Analysys Mason agrees:[84]

> These statements [that alarms and facsimile are based on legacy technology] are not backed up by any analysis (for example, is it acceptable for customers with no broadband and no mobile coverage to have no access to alarms ?) nor are they necessarily relevant. It is not whether alarms can be "easily" adapted that is at issue: it is whether the costs of these adaptions should be considered part of the costs of the MEA.

Statutory interpretation

247 The Commission has suggested that Chorus, Orcon and CallPlus are "reading down" the statutory definition of TSLRIC:[85]

> We find these submissions, which read down the statutory definition of TSLRIC, unsupported by the statutory language, context and broader scheme of the Act, and therefore unpersuasive. As Dr Every-Palmer suggested, if such an interpretation of the Act was intended, we would have expected Parliament to be clear and unequivocal that this was its intent.

248 We do not consider our request that the Commission consistently apply a conventional approach to TSLRIC to be a "reading down" of the Act. Indeed, the Commission quotes Chorus as focusing:

248.1 "closely on the literal words of the TSLRIC definition";[86] and

248.2 on the fact that "concepts like core functionality do not appear in the Act".[87]

249 It is important that "core functionality" does not appear in the Act. As Chapman Tripp outlines:[88]

> [the view that the "service" being described is able to be abstracted to capture only the "core functionality"] departs too far from the provisions of the Act, and reads too much into the language used in the… definition of TSLRIC

[83] Commerce Commission, Consultation Paper (9 July 2014) at [157].

[84] Analysys Mason, Response to July Consultation (6 August 2014) at 1.6.

[85] Commerce Commission, Consultation Paper (9 July 2014) at [102].

[86] Commerce Commission, Consultation Paper (9 July 2014) at [100].

[87] Commerce Commission, Consultation Paper (9 July 2014) at [100].

[88] Chapman Tripp Memorandum (11 April 2014) at [19].

250 Chorus, Orcon and CallPlus are not reading down the statutory definition of TSLRIC. Rather, other submitters are reading in novel concepts which are not available on the plain words of the Act, and by doing so are reading down the service to be modelled. The "literal" words of the Act are clear – "the facilities and functions that are directly attributable… the service."

251 Finally, if the Commission's point is that Parliament would have signalled any intention to move away from a conventional interpretation of TSLRIC, we reiterate that our interpretation of TSLRIC is conventional. But even if this were not the case, a "purposive" interpretation cannot justify the significant re-writing of the words of the Act that is required to enable modelling of only the "core functionality" of the service.[89]

Use of "operator strategy" in selecting the MEA

252 We agree with Analysys Mason that TERA should not be placing weight on technology choices being made by New Zealand operators:[90]

> We believe that this "operator strategy" is not correct as a means of selecting the MEA, nor consistent with the choice of the most efficient technology to provide the UCLL and UBA services according to a specified list of criteria, which is the approach described by the Commission in the process and issues paper, e.g.
>
> > 105. Accordingly, we intend to make a hypothetical assessment of the efficient cost today for an equivalent service, unconstrained by Chorus' (or end-users') historic technology choices, but capturing the "core functionality" of the regulated service.
>
> The New Zealand operators are not operating in a greenfield scenario, as a new entrant influenced only by commercial considerations: this applies both to the LFCs and to the wireline and wireless elements of the RBI. They have existing assets such as duct, poles, and cables; government funding has been made available under specific conditions and providing specific constraints.
>
> None of the LFCs nor RBI providers (other than Chorus) actually provides a service directly comparable to UCLL ; they are providing layer 2 or higher services where the product definition (e.g. peak downstream speed) is controlled by the LFC or RBI provider (which may also be constrained by the contract with the government).

253 The Commission should be mindful not to ask "what would a service provider build today?" Rather, the Commission is required to ensure that it has first identified the relevant service to be modelled, and then selected a MEA which is valid.

The question of "core functionality"

254 If we were to accept the Commission's "core functionality" logic, we would still regard many of the functions which are unable to be offered over FTTH / FWA as "core" to the UCLL and SLU STD services.

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89 The Courts have on numerous occasions stated that a "purposive" approach to interpretation does not enable the legislation to be redrafted: see, for example the authorities collected in J F Burrows and R I Carter *Statute Law in New Zealand* (4th ed, 2009) at 225 – 226.

90 Analysys Mason, Response to July Consultation (6 August 2014) at 1.8.

255 The concept of "core functionality" would need to be informed by section 18. Given the focus of section 18, core functionality would need to be assessed from the perspective of the end user. End users today would expect (for example) their alarms and SKY set-top boxes to work and this is supported by the fact that Chorus is still asked to provide a copper access line in apartment buildings, new subdivisions, and under the TSO obligations today.

256 Since section 18 frames the Commission's purpose as being for the interests of end users, it is important to consider what is "core" from the perspective of those users (as opposed to the perspectives of RSPs).

257 We expand on these functionality and fixes in Appendix 2.

Use of a cross-check copper/FTTN model

258 We support the Commission's proposal to build a copper/FTTN model alongside its FTTH model, so long as both models fully provide the required service functionality.[91] Developing both models in parallel will enable the Commission to identify and set costs based on the lowest cost MEA.

259 At paragraph 180, the Commission appears to propose a cost-based adjustment to fibre prices, should its modelling show that copper is lower cost:[92]

> …TERA recommends modelling two networks, a copper network and a FTTH/FWA network, and deciding whether or not to make a cost adjustment to our FTTH MEA depending on the results to identify the least cost, subject to section 18 considerations.

260 We seek further clarification on what the Commission intends by a "cost adjustment". In our view, and expressed previously, if the copper/FTTN is found to be lower cost than FTTH, it should replace FTTH as the MEA for UCLL and SLU. TERA seems to support this, by identifying that if the copper/FTTN model produces a lower cost than the FTTH model, then "the UCLL price is equal to the copper/FTTN cost."[93]

261 TERA contrasts this "option 2" with "option 1" – adjusting for costs by identifying each asset of the network and replacing each asset with copper/FTTN assets where they are found to be cheaper.[94] As we have previously submitted, an HNE would not roll out a network which picks and chooses from several technologies. There are inherent costs to using multiple technologies and the costs must be taken into account in calculating the efficient cost of the network.[95] To avoid these, an HNE could select the lowest cost MEA for its entire network. We agree that option 2 is the correct approach.

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91 See also Analysys Mason, Response to July Consultation (6 August 2014) at 1.3.

92 Commerce Commission, Consultation Paper (9 July 2014) at [180].

93 TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 47.

94 TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 47.

95 Chorus "Submission on UCLL FPP process and issues paper" (14 February 2014) at [241]; Chorus "Cross-submission on UCLL and UBA FPP further consultation paper" (30 April 2014) at [2.2] and [20]; and Analysys Mason "Response to Commission" (14 February 2014) at page 25.

262 Analysys Mason also notes:[96]

> … if the cost of a copper network is found to be lower than fibre, we believe an adjustment is not necessary. Rather, in that scenario, the lowest cost technology to provide the required service is copper, and so the MEA must be considered to be copper.

Modern equivalent asset for the UBA service

263 Chorus supports the Commission's identification of the UBA MEA as Ethernet over copper. The Commission has rightly emphasised that the UBA MEA must take Chorus' existing copper network as inputs, and not add RBI fixed wireless, as "this is the network presupposed by the service description in the Act."[97]

Forward-looking costs and asset valuation

264 The Commission is required to set a price that is forward-looking. We agree with the Commission's view that forward-looking costs reflect the costs of a forward-looking HNE which faces real world New Zealand conditions:[98]

> Forward-looking costs reflect the costs that a network operator would incur if it built a new network today using assets collectively referred to as the modern equivalent asset, which we discuss further below. The costs of these assets are the costs of currently available equipment as opposed to the costs of older equipment that may actually still be in use.

265 The Commission expressed the view in the Consultation Paper that, while there are different ways of interpreting forward-looking in the context of TSLRIC, it will generally involve looking at ORC, and that ORC is appropriate for the model.

266 We believe the Commission can only interpret forward-looking costs as current replacement costs. Forward-looking, by definition, excludes backward-looking considerations, and an HNE would be required to purchase assets at today's costs.

267 We agree with the Commission that an ORC asset valuation is consistent with its previous approach, as well as the TSLRIC objectives of predictability and efficient investment. The Commission has rightly identified the importance of considering investor expectations as required by section 18.[99] We agree with the Commission that its asset valuation approach is the same approach that investors will have expected. In particular:

267.1 As the Commission has identified, using ORC is consistent with its previous approach and the TSLRIC objectives of predictability and efficient investment;[100]

267.2 In the Commission's 2002 and 2004 TSLRIC principles papers it signalled that ORC was most consistent with the Act's "forward-looking" requirement; and

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[96] Analysys Mason, Response to July Consultation (6 August 2014) at 1.3.

[97] Commerce Commission, Consultation Paper (9 July 2014) at [168].

[98] Commerce Commission, Consultation Paper (9 July 2014) at [130].

[99] Commerce Commission, Consultation Paper (9 July 2014) at [59].

[100] Commerce Commission, Consultation Paper (9 July 2014) at [138].

267.3 Investors (as well as parties) will not have taken into account the non-binding EC recommendation which the Commission refers to and rejects, which was finalised in 2013.

268 We also agree that an ORC methodology will set the correct level of costs for bypassing elements of the network and should best incentivise the efficient build or buy choice. Build or buy is an important consideration. It is necessary to send a signal that entry is only efficient if the entrant has lower cost, that is, an entrant would only profitably enter if it can match the ORC.

Re-use of Chorus assets

269 In considering how to treat existing Chorus assets that may be re-used (for example ducts, trenches and poles), the Commission again expresses the view that different approaches to asset valuations may be used in the TSLRIC model. We believe the Commission can only value assets using ORC. Therefore, we agree with the Commission's preliminary conclusion to value all assets at ORC, regardless of whether existing Chorus assets could be re-used.

270 In addition, we agree with the Commission's preliminary view of valuing all assets on the basis of ORC because:

270.1 As noted above, there has been a reasonable expectation that assets would be valued at ORC under a TSLRIC model (from Chorus and reasonable investors), and therefore having special rules for valuing potentially re-usable assets is unlikely to best meet the requirements of section 18;

270.2 Significant changes to the asset valuation should not be taken lightly, as changing the asset valuation now would be synonymous with re-writing the regulatory rules on which long-lived investments have been made since the legislation was introduced to set prices based on TSLRIC;

270.3 Using ORC is consistent with sending the right build or buy signals, in the sense that a new entrant will only profitably enter if it can match the optimised replacement cost of the network. In other words, it discourages inefficient duplication of infrastructure by setting a price based on the perceived cost of a feasible HNE; and

270.4 Replacement cost asset valuation is commonly used in other jurisdictions applying TSLRIC.

Performance adjustments

271 We agree with the Commission's decision not to make technical performance adjustments to the asset valuation (i.e. adjustments for willingness to pay or technical capability). Analysys Mason agrees that any performance adjustment is not objectively observable today, and that an adjustment would likely mean that the resulting price would not cover replacement costs.[101]

[101] Analysys Mason, Response to July Consultation (6 August 2014) at [1.12].

272 The Commission has rightly emphasised the link between regulatory predictability and certainty, investor expectations and levels of investment, and the promotion of competition for the long-term benefit of end users. The Commission is right to observe that investors have expected a conventional application of TSLRIC. The suggestion of a technical performance adjustment is unconventional and untested. It is also unlikely to result in an estimate of cost as required by the Act.

273 The history of the New Zealand experience demonstrates that Chorus and its investors could not have anticipated a technical performance adjustment to asset valuation:

273.1 The Act was passed in 2001 with TSLRIC as a FPP;

273.2 The Commission published its TSLRIC framework and methodology in 2002 and 2004 (including an ORC asset valuation);

273.3 The Act was amended in 2006, introducing unbundled access services, and TSLRIC was endorsed as the FPP;

273.4 Telecom committed to the FTTN cabinetisation investment following the 2006 amendments;

273.5 The UCLL and UBA STDs were set in 2007; and

273.6 At the demerger of Telecom in 2011, the Act was again amended and TSLRIC reaffirmed.

274 At each of these key reform and investment milestones it was reasonable for investors to assume the regulatory regime would apply a conventional TSLRIC methodology, in particular the methodology described in the Commission's 2004 paper.

275 An adjustment based on either technical capability or willingness to pay is also not in line with EC recommendation from 2013. As noted by TERA [section 3.2.4.], the EC recommends an adjustment based on costs. To our knowledge, Switzerland is the only country which is requiring an adjustment based on technical capability (a "performance delta"), and only since 1 July this year. We are not aware of any countries which have implemented an adjustment based on willingness to pay.

APPENDIX 2: MODELLING THE UCLL STD SERVICE

Fixes required for a P2P FTTH service

276 The viable MEAs for UCLL are either a copper MEA or a P2P FTTH MEA with important fixes modelled. Other MEAs will not be capable of providing the UCLL STD service and meeting RSPs' and end users' current experiences of the UCLL service.

277 Fixes are necessary in the case of P2P FTTH as no devices which currently connect to a UCLL MPF will connect to a P2P fibre. We have previously outlined the main services which end users use and value over the UCLL service, which cannot be offered over FTTH network without fixes.[102]

278 For fibre to be considered as a MEA for UCLL, the Commission should include in its model the costs of those fixes which are required in order for the new FTTH network to meet the requirements of the UCLL STD. In particular, fixes are required because many devices rely on a metallic path from the exchange to end user.

279 Figure 1 below illustrates the fixes necessary to allow P2P FTTH to take the place of a UCLL MPF.

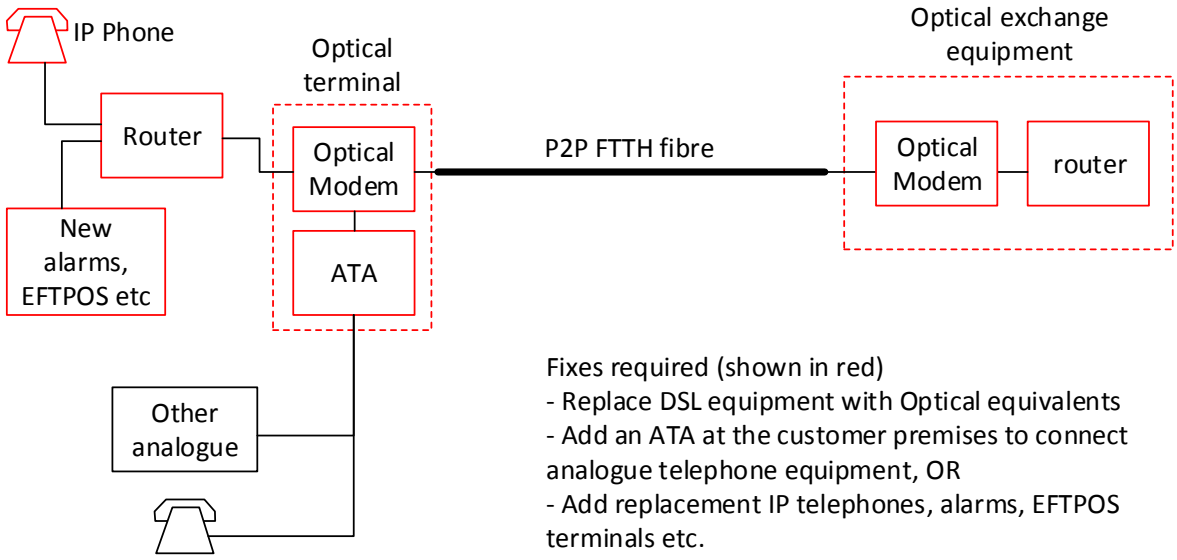

Figure 1: Fixes required by P2P FTTH

Devices which require a copper line

280 DSL-based broadband services provided over UCLL require a copper line. DSL equipment cannot connect to fibre, and would need to be replaced by fibre (optical) equivalents. This applies to both RSP DSLAM equipment in the exchange and customer DSL modems in the home.[103] In many cases, CPE which incorporates DSL functions

[102] Chorus "Submission on further consultation paper for UCLL and UBA FPPs" (11 April 2014) at [96].

[103] While it is technically feasible to adapt from DSL to FTTH at the end-user's premises, this is unlikely to be viable in practice.

also performs a range of functions and would also need to be replaced. For example, most wireless DSL routers in use today could not be used in conjunction with an optical modem as they only support a DSL WAN connection. A replacement wireless router, which supports an Ethernet WAN connection which could connect to an optical modem, would be required to maintain the WiFi, switching and routing functions which such a device provides.

281 A number of devices require an analogue telephone line, which UCLL is able to support directly without adaptation. These devices are:

281.1 Analogue telephones, facsimile, dial-up internet modems; and

281.2 Those EFTPOS terminals, SKY set-top boxes, and medical and security alarms which require an analogue telephone line.

282 The UCLL service also supports a number of legacy copper business-grade services. These also provide connectivity using devices which require a copper line.

End users without a broadband connection

283 On a UCLL connection, analogue telephone devices can connect directly to the copper line without requiring a broadband connection. With fibre, analogue telephone devices cannot connect to the FTTH network without additional equipment. Some of this equipment is the same as is required for the provision of broadband services, so for such "voice-only" customers the costs of providing a broadband connection will also be incurred – even though they do not require a broadband service.

Devices which require a DC power path

284 Some devices (primarily alarms and analogue telephones) rely on the physical characteristics of the UCLL STD service by drawing their power from the UCLL line. Just as these telephones and many such alarms require an analogue telephone line to provide connectivity, they also require the power that an analogue telephone line provides.

Specific services affected

285 Below we outline the specific services and devices which will require fixes in order to operate over a P2P FTTH network, whether for the reasons above or for additional reasons.

Analogue telephones

286 Many houses still maintain a telephone powered by the UCLL line. These households see a benefit in having a telephone which can operate during power cuts and emergencies. Emergency phones such as those in elevators fit within this category. People with older analogue phones are often the elderly and other vulnerable groups who require emergency assistance and/or are less likely to have upgraded their telephones. For all of these phones, batteries will be required to power all equipment in the end user premises which is needed to enable the telephone service (e.g. optical terminal and ATA) and these batteries will incur ongoing operating expenses. The Ministry of Health lists an analogue phone as a "critical supply" for emergency

planning.[104] During the Christchurch earthquakes most of the city lost power and many cell towers went down immediately or after running out of battery backup. In order for FTTH lines to operate at such a time they would need batteries and local power generation at network nodes, which are additional costs to those of a copper network.

287 There is real world evidence of the importance of fixed line analogue telephones to end users. The vast majority of people with a broadband connection still select to pay extra for an analogue phone line, over the low frequency service. The latest published Chorus figures show that, at March 2014 90.2% of broadband connections on UBA and VDSL[105] were bundled with a traditional PSTN service.[106]

Facsimile

288 Most facsimile devices operate over analogue phone lines. They cannot operate over FTTH for similar reasons to those above. Businesses continue to see a need for fax machines, so there is a cost in migrating these end users to an alternative service.

Dial-up internet

289 Dial-up internet requires an analogue connection to connect end users to the internet, and remains an important service for a number of users. People on dial-up will often not have alternative access to broadband (whether fixed or mobile). There is a cost associated with migrating and upgrading these end users to FTTH.

EFTPOS terminals

290 Most EFTPOS terminals complete transactions using analogue calls, similar to dial-up internet. While it is technically feasible for terminals to connect via VoIP services, or for some via a broadband connection, many businesses with internet access have not moved to IP-based EFTPOS solutions. The cost of migration here will need to be modelled.

SKY set-top units

291 Many SKY set-top units transmit and receive data over analogue lines. The 2010/2011 Telecom trial estimated that 500,000 units relied on analogue UCLL lines. SKY's "Help & Support" web pages currently explain:[107]

> If you're running VoIP or fibre only for your landline then you will not be able to purchase SKY Box Office Movies, SKY Arena Events or On-Demand (only available on MY SKY) using your SKY remote.
>
> In order to purchase these using your SKY remote an active **copper** landline connection is required.

[104] http://www.health.govt.nz/our-work/emergency-management/emergency-management-disaster-planning-and-business-continuity-primary-care. Accessed July 2014.

[105] We have not included UCLL connections, since Chorus is unable to determine whether PSTN voice services are provided over those lines.

[106] https://www.nzx.com/files/attachments/192601.pdf. Accessed August 2014.

[107] https://skytv.custhelp.com/app/answers/detail/a_id/1768/kw/copper. Accessed July 2014.

292 Some modern SKY set-top units – in particular MySKY units – have Ethernet ports, so could technically operate over IP. However SKY does not operate these units over IP, despite the option being available. SKY presumably sees value in the reliability of analogue connections. By contrast, SKY over IP would have higher setup costs, including the cost of retraining field service staff, and ongoing maintenance costs. In particular, SKY and SKY technicians would:

292.1 Have to gain access to home broadband networks in order to set up SKY;

292.2 Be called out when there is a fault with the home broadband network;

292.3 Be called out when end users changed RSP or modem; and

292.4 Need to negotiate with RSPs for data used by SKY units to be excluded from end user's monthly bandwidth metered usage and charges.

Alarms

293 Various medical and security alarms rely on the UCLL STD service. In particular:

293.1 Certain alarms rely on DC power over UCLL to operate. This is regarded as an important function, since batteries are not a fool-proof source of power and need to be replaced, which is not feasible for critical medical alarms and for long-term alarms in lesser frequented buildings such as storage facilities and holiday homes.

293.2 Many alarms are monitored over the analogue UCLL line, using dial-up modems. This is also important for long-term alarms and for medical alarms where people may be incapacitated and alone, unable to act on an alarm themselves.

294 The 2010/2011 Telecom trial estimated that there were 300,000 monitored alarms in New Zealand which relied on the UCLL network. In addition, more (unmonitored) alarms will draw power from the UCLL line.

295 Since these alarms will be stranded on an overnight fibre network without fixes, they will need to be "fixed" by adding ATAs, broadband connections and batteries. Batteries will add additional burdens for users or providers.

Legacy copper business-grade services

296 A number of businesses today continue to purchase copper-based low speed, dedicated capacity services despite having fibre available in their areas. These services use technologies such as HDB3, SDSL and HDSL which are copper-based technologies and thus require a copper connection. These businesses see benefits in the analogue technology, which interacts with their machines and integrated setups.

297 Modern substitute services exist but changing services would often require replacing an end user's systems at a cost.

Wholesale demand for UCLL functionality

298 These devices and services are important to end users:

298.1 Chorus receives requests to provision copper to new apartments and subdivisions alongside fibre, since current services are not set up for fibre. In particular, we have been told by developers that RSPs require exchange-powered copper lines for lift phones and fire alarms; and

298.2 Chorus maintains copper connections for third parties, even where fibre is available;

298.3 Telecom often requests that Chorus maintains copper connections when there is a UFB installation. Telecom does not yet have a VoIP replacement service, so it relies on copper connections for POTS voice.

Selection of valid FTTH technology

299 If the functionality fixes above are modelled for a P2P FTTH network, P2P FTTH would be a valid MEA. We agree with TERA that, if FTTH is selected as the MEA, P2P is appropriate (as opposed to GPON).[108]

300 This is the case because on the one hand, P2P is able to be unbundled:[109]

> Of the FTTH options we consider that P2P is "unbundleable" on a per-end-user basis allowing an access seeker to install its own electronics to provide layer 2 services and, as long as ATA and battery backup are provided, capable of meeting most of the required criteria.

301 On the other hand, GPON is not able to be unbundled on a per-user basis (i.e. in a manner consistent with the UCLL service), so is not a valid MEA for UCLL:[110]

> By comparison GPON is not unbundleable on a per-end-user basis. In a PON, end-users share the infrastructure between the splitter and the ODF location. It is possible to provide access to a cluster of end-users by renting a splitter at the splitter location (and the fibre connecting that splitter to the ODF location) to each service provider. The way we put this in our UCLL process and issues submission was:
>
> > "Even if the other criteria are met, the business case for unbundling depends on the ability to reach many customers from the same point of interconnection at the same per-user cost. However, it cannot be met by unbundling a PON network at the splitter location, as the cost then does not scale per end-user in the same way."
>
> Our view is that GPON is not a valid basis on which to cost UCLL.

How to model P2P FTTH with full UCLL service functionality

302 To model P2P FTTH, the Commission should include the various "fixes" required for these devices and services to continue to operate.

[108] TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 37.

[109] Analysys Mason, Response to July Consultation (6 August 2014) at [1.14].

[110] Analysys Mason, Response to July Consultation (6 August 2014) at [1.14].

303 Analysys Mason identifies that, for modelling purposes, all such costs should be included regardless of who they fall on:[111]

> The purpose of the FPP exercise is to determine the most efficient way to provide the defined service (UCLL). Redefining the service in such a way as to push the costs onto other parties (such as end-users or the RSPs) does not demonstrate that the revised definition is a more efficient solution (lowest total cost), just that it reduces the costs carried by the modelled operator.
>
> The Swedish regulator takes this view in their cost modelling, noting that:
>
> > "No "external" costs should occur when a similar service is offered. This for example means that if fibre or radio are the MEA in the access network then the cost for the relevant CPEs (required to allow an end-user to use his analogue [PSTN] telephone) be included in the model."

304 In most cases, switching devices and services to operate over P2P FTTH will incur at least CPE costs and operating expenses.

Costs associated with domino effects from fixes

305 In general, migrating devices away from analogue lines and onto IP connections will have a domino cost effect on other devices, especially in businesses. Large corporates are likely to incur additional costs in switching to IP-based services, especially where the telephone network forms part of their ICT systems. At the very least, changes to larger systems would need development, testing, deployment and training. These are costs which will be significant to businesses.

Modelling required to include fixes on multiple devices

Devices which require an analogue line

306 For each device which relies on analogue lines and cannot operate over P2P FTTH, the Commission should model the additional costs of CPE, being either:

306.1 The cost of components to allow the analogue device to operate over IP. The most common such component is an analogue telephone adapter (**ATA**) in conjunction with equipment providing a broadband connection over the P2P FTTH fibre; and/or

306.2 The cost of components to allow the device to operate over P2P FTTH. The most common such cost relates to DSL equipment – both for CPE (where ATAs do not work with particular devices/services) and for RSP equipment in the exchange.

307 Some devices which are technically able to work over ATAs will still not work in specific cases. This experience has especially been the case with EFTPOS terminals, where retailers have had varied experiences when using VoIP services.

308 Analysys Mason identifies that the incremental cost of ATA is likely to be approximately NZD 20, at 1 per customer.[112]

[111] Analysys Mason, Response to July Consultation (6 August 2014) at [1.6].

End users without a broadband connection

309 In addition to the CPE costs above, customers without broadband connections will require new connections for their newly IP-enabled devices. This will require:

309.1 A modem at the end user's premises;

309.2 A port on the central electronics at the ODF location (e.g. Ethernet access switch); and

309.3 Contribution to the operating costs of the broadband network that the device requires in order to operate over FTTH.

310 Analysys Mason expands on this in more detail:[113]

> For customers requiring voice services only, the required additions are greater: these customers also need a broadband CPE (which could incorporate the ATA), a port on the central electronics at the ODF location (e.g. Ethernet access switch), and a contribution to the operating costs of the broadband network. Only the operating costs would add material complexity; the other items are again simple assets with trivial dimensioning rules. However, very similar port costs and operating costs are currently being estimated by the Commission to calculate the TSLRIC of the additional costs of UBA. (These costs are not included in the UBA costing because they would be incurred in this case for voice only customers - who by definition do not buy UBA).

Additional device-specific modelling required

Facsimile

311 The Commission has identified that the modern equivalent of a facsimile is an email attachment.[114] As discussed above, what is relevant is the cost of:

311.1 Switching from an analogue fax machine to FoIP – in some cases being the cost of ATAs and in other cases the cost of new fax machines; and

311.2 Batteries and new broadband connections, where required.

Dial-up internet

312 The 2010/2011 Telecom trial estimated that dial-up modems would cost $171 million to replace.

EFTPOS terminals

313 The 2010/2011 Telecom trial estimated that the 300,000 EFTPOS terminals would cost $90 million to replace. In addition, retailers who rely on analogue EFTPOS terminals will have higher operating costs over IP lines.

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[112] Analysys Mason, Response to July Consultation (6 August 2014) at [1.7].

[113] Analysys Mason, Response to July Consultation (6 August 2014) at [1.7].

[114] Commerce Commission, Consultation Paper (9 July 2014) at [157].

SKY set-top units

314 The 2010/2011 Telecom trial estimated that 500,000 SKY set-top units would cost $125 million to replace. In addition, as discussed above:

314.1 SKY currently utilises copper inputs for SKY units; and

314.2 For SKY to be offered over IP, additional setup costs and operating expenses will be incurred.

Alarms

315 The 2010/2011 Telecom trial estimated that 300,000 monitored alarms would cost $313 million to replace, being $248 million for security alarms and $65 million for medical alarms.

316 If the Commission models fixes rather than replacements, the costs of batteries and additional changes should be included.

The significance of the functionality shortfalls of FWA

317 FWA technology is unable to meet the requirements of the UCLL STD service.[115] We expand on the reasons for this below.

FWA cannot be unbundled

318 Analysys Mason has outlined in detail the importance of UCLL being a layer 1 service which allows RSPs to choose either to buy UBA or to provide services by installing their own layer 2 infrastructure:[116]

> The operators currently buying UCLL do so in order to attach their own electronics. In effect, they are choosing to build DSLAMs and to self-supply an equivalent product to UBA in order to compete with Telecom and others at the retail level. Their case for doing so was based on being in control of the electronics and able to choose the service peak speeds and data throughput themselves (rather than choosing from a price list set by Chorus and which formed a common input to all UBA-based retail ISPs). If the UCLL input is (in effect) UBA, then there is no longer a business case to be an unbundler, a point that we made previously in our process and issues paper.

319 With UCLL, RSPs are able to invest and select the technology to deploy over the physical layer. This enables differentiation between RSPs. RSPs compete with Chorus' and other RSPs' layer 2 service offerings. This is the key market purpose of UCLL, and the reason RSPs are incentivised to unbundle.

320 FWA is a layer 2 service. The network configuration itself dictates coverage, capacity, speed, throughput and a spectrum. An FWA service at layer 1 would be only a radio spectrum and antenna.

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[115] Chorus "Submission on further consultation paper for UCLL and UBA FPPs" (11 April 2014) at [19], [84] and [88]; and Chorus "Cross-submission on UCLL and UBA FPP further consultation paper" (30 April 2014) at [17].

[116] Analysys Mason, Response to July Consultation (6 August 2014) at [1.5]. See also: Analysys Mason, Response to Commission (14 February 2014) at page 15.

321 When purchasing FWA, RSPs cannot differentiate themselves from other RSPs and from the HNE's FWA UBA service. In particular they cannot:

321.1 Differentiate their services based on layer 2 investment choices;

321.2 Control the performance and reliability of their layer 2 services;

321.3 Target different market segments based on their choices of technologies; and

321.4 Provide end users with similar choices to those available in the market today.

322 TERA's Expert Report makes it clear that FWA is a layer 2 service in its analysis of speed.[117] By contrast, a layer 1 service is simply a platform and does not have a particular speed component. It is the technology which is added to that layer 1 service which determines the speed of the resulting broadband service.

FWA cannot theoretically unbundled

323 FWA is not able to be treated as a theoretical layer 1 service by RSPs. Once RSPs buy the HNE's FWA service, there is no business case to unbundle and differentiate services from competitors' services.

324 In theory RSPs could buy elements of the FWA service (such as just tower rental), but not the complete service, and invest in parallel infrastructure to the HNE. Despite this possibility, the priced FWA service would still remain a layer 2 service, and RSPs would simply be duplicating the HNE's service.

FWA is not a "non-blocking" technology

325 The UCLL STD service is non-blocking – i.e. one end user's traffic cannot block another's and RSPs are unconstrained in the quality of services they can offer. End users only affect each other's experiences due to capacity beyond the UCLL or SLU component of the network.

326 By contrast, FWA is provided at a "holistic" or "shared" level from a particular node. Capacity and speed from each transmission point is shared by those connected to the node. One end user's traffic directly affects another's.

327 The HNE needs to build sufficient towers and ensure each end user has uncontested spectrum at all time – providing the same "non-blocking" experience to that of a copper network.

328 This further illustrates the point above that FWA is a layer 2 service. RSPs could not invest in or add to a FWA service to give particular end users a different experience. The only way to do so would be to compete with (as opposed to add to) the FWA service itself by investing in competing technology such as additional spectrums or transmission sites.

[117] TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 22.

There are no fixes for FWA

329 In theory, a FWA network could be built to be non-blocking. This would require the HNE to reserve particular spectrums, channels, and bandwidth per end user, which the Commission would be required to cost in its model. The HNE would effectively be building a FWA transmission line for each customer. At this point, the costs of FWA are very high (especially due to multiple spectrums).

330 This would also not cure the problem of FWA being a layer 2 service. RSPs could sell different products, but only through purchasing different layer 2 services from the HNE.

FWA is not a point-to-point technology

331 TERA identifies that FWA is not a point-to-point technology, but decides that is acceptable to model where the costs of FTTH are too prohibitive:[118]

> FTTH should be the MEA for copper but in more remote areas where its cost is too prohibitive for it to be the MEA FWA should be the MEA, even though FWA is not a point-to-point technology.

332 As Analysys Mason outlines, this "relaxing" of a characteristic of the STD service is inappropriate:[119]

> The "point to point" characteristic as described by TERA is not a valid criterion. Allowing a criterion to be relaxed subject to "Economic rationality" is not valid, because it implies that the criterion need not be met if it is expensive to provide. Given that selection of the MEA is already predicated on the technology being the lowest cost means of meeting the required "core functionality", "economic rationality" renders this criterion meaningless. Either point to point is a part of the required core functionality or it is not.

333 As explained above, under TSLRIC the service being priced should be identified first and then an appropriate MEA.

FWA requires different CPE and battery backup

334 As with FTTH, end users will require broadband connections, different CPE, and battery backup in order to operate many of their current devices on a FWA network. See above.

FWA (and FTTH) do not allow the HNE to meet TSO obligations

335 An HNE will need to provide inputs to Telecom's TSO services. Dial-up internet and facsimile cannot be provided over FWA technology.

The real costs of FWA

336 If FWA is modelled, while there are no fixes to replicate the UCLL STDs service's functionality, we outline what should be included in the model to produce a viable network service (albeit one not capable of providing the UCLL STD service).

337 There are three key cost drivers that should be modelled:

[118] TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 37.

[119] Analysys Mason, Response to July Consultation (6 August 2014) at [1.4].

337.1 Costs incurred to reach 100% of end users in the relevant coverage areas;

337.2 Costs incurred to provide sufficient capacity and throughput per end user; and

337.3 Costs incurred to utilise uninterrupted radio spectrums.

338 We expand on these and additional cost drivers below. In addition, as we have noted previously (and as supported by Analysys Mason[120]), there is added cost in deploying multiple technologies:[121]

> However actually deploying multiple technologies for one service will be highly complex and costly. The Commission should cost only its one cheapest MEA, as a new entrant would.

TERA's benchmarked estimate

339 So far, TERA has benchmarked an estimate of FWA based largely on the cost of cell sites in European studies.[122] This benchmarking is useful to estimate the general level of costs, but underestimates the costs in New Zealand. This calculation doesn't recognise that the costs of connecting *every* end user are quite different from the costs of connecting *most* end users.

340 The benchmarking also doesn't include significant additional costs including access roads, lease arrangements for land, power to sites, maintenance costs, customer CPE, and back-up components. Some cell sites can only be accessed by helicopter, which significantly increases the cost of the site. We assume that the actual modelling will be more sophisticated and take account of the particular difficulties imposed by New Zealand's geography.

Costs incurred to reach all users

341 The Commission's model will need to reach 100% coverage of all premises within the UCLL footprint. This means that the model will have to recognise the costs of reaching 100% of all end users not served by the modelled fixed lines.

342 This means that the Commission needs to model more than the existing RBI. In New Zealand there is no fall-back alternative to UCLL (such as satellite), so the model must be capable of continuously delivering to the whole UCLL footprint. This is possible in theory, but involves particularly high costs.

343 We note, for example, that in the RBI context, about 80% of the "Zone 4" area targeted by RBI will be covered by either fixed line or fixed wireless broadband. Combined with Zone 1-3 fixed line areas, this equates to about 97% coverage of UCLL lines. The remaining 3% have not been addressed by RBI due to the high cost of providing broadband, or any service, to these locations.

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[120] Analysys Mason "Submission on further consultation paper for UCLL and UBA FPPs" (11 April 2014) at [26].

[121] Chorus "Cross-submission on UCLL and UBA FPP further consultation paper" (30 April 2014) at [20].

[122] TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 29.

The Commission should look at real-world costs

344 The cost of FWA is extremely variable, and increases quickly if the network is required to reach 100% of rural premises. Only for customers in remote areas which are unaffected by difficult terrain features is FWA relatively cheap.

345 When there is a requirement to connect 100% of customers in a coverage area, FWA becomes substantially more expensive. For this reason Chorus has used CMAR at the edges of the network. CMAR uses wireless from exchanges to cabinets, but copper is the final connection technology as wireless to the home is costly in these areas if it is to promote the required degree of certainty of service. The cost of making FWA available with acceptable performance at all rural UCLL locations is prohibitive.

346 Analysys Mason agrees:[123]

> Even in the RBI scheme, only 80% of premises in zone 4 are targeted for coverage, which means that there can and will be for example isolated homes not connected even within areas where wireless coverage may be available to many of their neighbours. Providing partial coverage using wireless means is much cheaper than full coverage; providing 100% availability (or even 99% availability) within New Zealand is much more expensive - to the extent that the supposed cost advantage of wireless methods can be entirely eliminated (and they can be more expensive than wireline as a result).

Failure rates will be unacceptable

347 Standard desktop modelling of FWA assumes a "failure rate". The failure rate describes the number of premises which appear in the expected coverage area but, on installation, do not actually receive service. This is usually due to interference from trees, hills, buildings and other obstructions.

348 The Commission's model cannot include acceptable failure rates. The Commission should be realistic and understand that some premises modelled in coverage areas will still not receive service. Contingencies must be modelled to ensure that the appropriate end users are connected to the network.

Minimum requirements of the TSO

349 In addition to being required to model a FWA network that consistently connects 100% of its coverage area, the FWA network must meet the TSO minimums.

350 In order for Telecom to meet its TSO obligations, the network operator must at all times allow it to purchase connections which are capable of meeting:

350.1 At least 95% of the time, 14.4kbps connection speed or higher; and

350.2 99% of the time, a 9.6kbps connection speed or higher.

351 The Commission addressed these issues when modelling the TSO using wireless technologies. We expand on that Commission experience from paragraph 355 below.

[123] Analysys Mason, Response to July Consultation (6 August 2014) at [1.8].

The Commission should be conservative

352 As the HNE will be legally required to service the whole UCLL footprint, the Commission should be conservative in its modelling to ensure that every end user is served. For example, failure rates (i.e. inabilities in practice to provide the specified service where expected) should be assumed to be high. NBN Co's FWA network was designed to a 5% failure rate but, post-installation, has been shown to have a failure rate of between 7% and 8%.

353 The Commission also has to be conservative since it is not modelling a "back-up" technology in the event that FWA fails for particular end users. In the case of NBN Co, fall-back satellite technology has been deployed due to the difficulties with consistent wireless connectivity.

Potential modelling fixes to ensure 100% coverage

354 There are various options for the Commission to model in order to ensure 100% coverage. These include:

354.1 Overlapping coverage per end user premises such that each premises is covered by two distinct cell sites (or more, depending on terrain and network design); and

354.2 Very high design specifications.

355 The Commission has had the benefit of expert advice on this issue when it was modelling the TSO using wireless technologies. Murray Milner of Milner Consulting suggested that these obstacles could be taken into account in desktop models by an appropriate assumption on fade margins:[124]

> In the Network Strategies report, they claim that a margin of 15-20dB as used by GQ-AAS is excessive (see Page 8). They do this based on a desktop calculation which provides 99.9% availability with lower margins. This may well be true in a desktop design (even this calculation has limitations as identified below). However, the desktop values must be translated into the field, where reality and calculations do not always correspond. In the field, there are always terrain obstacles, terrain database errors, vegetation, man-made obstacles and multi-path propagation effects, which mean that the desk top calculations do not represent the reality found in the field.
>
> This is the reason for needing a much higher margin than the calculations would suggest. My strong belief, based on many years of field experience (and supported by the recent BCL(Kordia) WLL reported results) is that the actual design margin should be a minimum of 25dB in all wireless desktop designs, to ensure that the design reflects into the field with a high degree of confidence – preferably 100%. Explicitly, all (meaning 100%) of CNVC dwellings within the given ESA must achieve an availability of better than 99.9% for telephony and dial-up data services when actually implemented in the field – ie there are no exceptions. From my experience, to achieve this outcome consistently requires a margin of at least 25dB for all

[124] Milner Consulting Limited "Cross-submission on Revised Draft Determination 2003-04" (18 January 2007) at pages 5 to 6, available at: http://www.comcom.govt.nz/regulated-industries/telecommunications/archive/industry-levy-codes-and-service-obligations-archive/tdl-liability-allocation-determination-archive/telecommunications-service-obligation-2001-09/2003-2004tsodetermination/.

dwellings, when the design is based on a desk top calculation as used by Network Strategies and GQ-AAS.

I also acknowledge that even with a margin of 25dB, there is a small but definite probability that a small number of CNVC dwellings will not be able to be served, when the desktop design is translated into the field reality. I fully expect that the use of higher directional antennas, remote wireless installations, judicious pruning of hedges and the like will solve these remaining few extra difficult situations. To allow for this work to be done in the field environment, it is also essential to build in some cost buffer into the cost models. Hence it is essential to define the wireless cap to encompass the extremes of the distribution of CNVC installations and not simply the average installation.

356 We recommend that the Commission revisit the reports of the independent experts it used during that modelling process and Telecom's expert, Dr Murray Milner.

Spectrum costs

357 Spectrum costs are a significant cost to building FWA networks. At the recent 700 MHz Auction, nine lots were purchased at a total of $270 million – an average of over $30 million per lot.[125]

358 In order to offer a non-blocking FWA service, an HNE would need to purchase an adequate amount of radio spectrum.

359 Furthermore there is currently no unused spectrum which could be given to an HNE. So, the HNE would need to take spectrum from existing operators.

Other cost drivers

360 There are several other cost drivers that should be modelled:

360.1 Operating expenses, which:

(a) Are particularly high in FWA networks relative to fixed networks, given the shorter asset lives as a result of increased risk of technology fault, weather conditions, and maintenance difficulties; and

(b) Include power and the unique access costs of FWA sites (some of which may only be accessed by helicopter);

360.2 Deployment, which will need to model the cost of wireless towers (including substantial backhaul to those towers), access roads and land arrangements. We note that asset sharing opportunities are limited because cell coverage towers do not traditionally serve isolated homes, but rather are located on rural highways, workplaces and towns; and

[125] http://www.rsm.govt.nz/cms/pdf-library/policy-and-planning/current-projects/digital-dividend-auction-700mhz/700-mhz-auction-notice-of-results. Accessed July 2014.

360.3 Costs of unique CPE for end users. As discussed in relation to FTTH, many end users' current broadband CPE and other devices will not work over FWA so the costs of the relevant fixes or replacement devices should be modelled.

361 Figure 2 below illustrates the additional CPE which is necessary to allow FWA to take the place of a UCLL MPF.

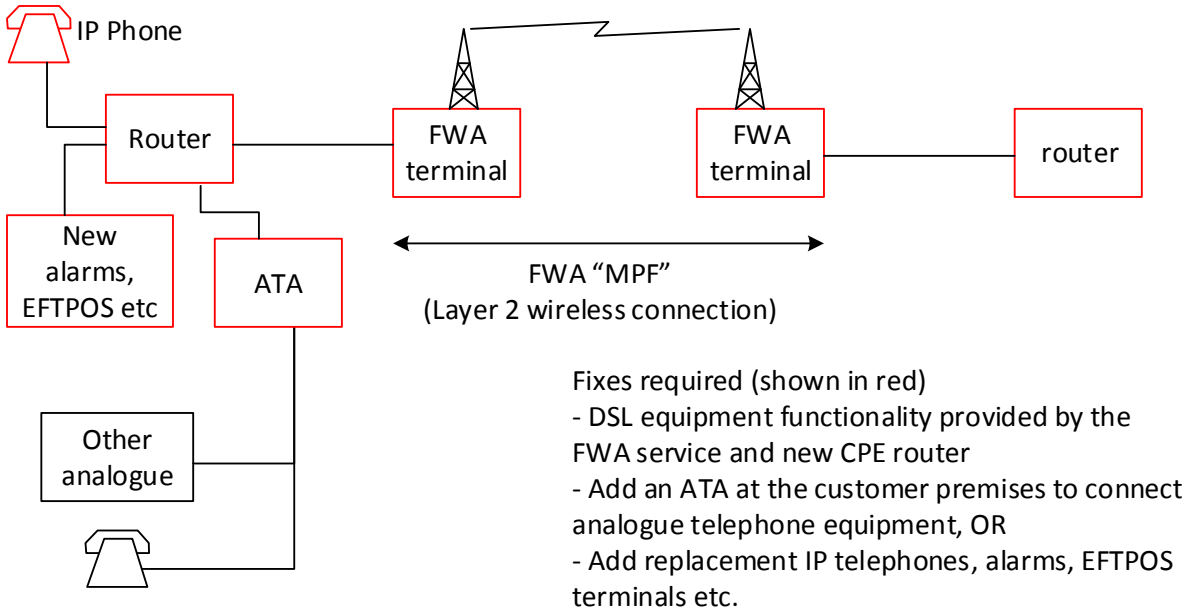

Figure 2: CPE fixes required by FWA

Extent of FWA to be modelled

362 As we have previously submitted, in relation to those end users not currently served by fixed line, the scopes of the services being modelled are defined in the UCLL and UBA STDs. Those RBI premises which are not served by Chorus' copper/FTTN network are beyond the scope of the service being modelled. In short, Sweden and Australia are not a precedent for replacing fixed line access with FWA.

363 The Commission's current proposal is to model FWA at the "edges of the network" by taking the current and projected RBI fixed wireless footprint.[126]

364 We note that Chorus' copper/FTTN DSL network is also present in much of that area. As Analysys Mason notes:[127]

> To propose the exclusive use of wireless in that area is therefore not reflective of the actual use of network technology in those areas, nor of the relative cost efficiency of the solutions (wireless might have been a cheap way to provide in-fill high speed services to users with long lines on an

[126] Commerce Commission, Consultation Paper (9 July 2014) at [164].

[127] Analysys Mason, Response to July Consultation (6 August 2014) at [1.9].

existing copper network but might not be equally well suited in a green field situation at the required levels of capacity and customer density).

365 TERA appears to rely on Sweden as an example of the edges of a fixed network being modelled using FWA.[128] However, in Sweden FWA was only modelled for the 2% of end users who were not connected to the fixed network (which, in our case, would be outside the geographic scope of the UCLL and SLU STD services).

366 Analysys Mason explains this and notes that FWA is rarely selected as a MEA in European models:[129]

> Accordingly, PTS is ensuring that where "LLUB is offered" FWA is not used; it is only used in the last 50k homes, which is an area in which there is no broadband demand in the model (and comparable to the number of lines with no existing ADSL offer). We have previously documented that TeliaSonera has a plan to use wireless to serve approximately the same number of homes. In New Zealand the equivalent in my opinion would be to exclude lines which are currently served using baseband remote from the geographical scope of UCLL.
>
> Other European regulators do not cost FWA as the MEA for LLU.

367 Analysys Mason has also commented on how much FWA has been modelled in Australia:[130]

> The ACCC model built by Analysys Mason (since superseded by the use of the building block model (BBM) in Australia) did deploy fixed wireless access (FWA) wireless connections for approximately 1% of sites (as may be expected, in highly rural areas); it also used satellite connections for a small number of isolated sites (0.3% of sites).

[128] TERA Consultants, Modern Equivalent Assets Paper (July 2014) at page 37.

[129] Analysys Mason, Response to July Consultation (6 August 2014) at [1.9].

[130] Analysys Mason, Response to Commission (12 February 2014) at [1.4.2].

APPENDIX 3: RESOURCE MANAGEMENT ACT AND LOCAL GOVERNMENT CONSTRAINTS ON NETWORK DEPLOYMENT

368 An important decision for the Commission is to identify the correct proportion of aerial deployment which is consistent with an HNE facing real world NZ conditions.

369 In determining the correct proportion of aerial the Commission needs to take into account:

369.1 Legal constraints on deployment, including planning restrictions under the Resource Management Act 1991 (**RMA**) and other relevant legislation;

369.2 Availability of existing infrastructure; and

369.3 The challenges in obtaining access to the poles of third parties, and the costs of doing so.

370 In this Appendix, Chorus provides additional information in respect of each of these matters.

Legal constraints on deployment

371 The regulatory environment in which Chorus operates, and any HNE deploying an FTTH network would seek to operate, is complex. In undertaking deployment of network on a national basis a network operator faces a range of legal compliance requirements under both the RMA and other environmental and heritage legislation.

372 In some cases, detailed rules do not exist for particular activities. Instead a network operator must acquire specific regulatory approval for undertaking deployment (which will often have specific conditions attached). The various consenting requirements also often vary from area to area. It is accordingly difficult to produce detailed design rules for network deployment that are accurate for all geographic regions of New Zealand. Instead, assessment of regulatory restrictions must be undertaken on an area by area basis.

373 Chorus has supplied to the Commission pursuant to a section 98 notice a significant amount of material on the regulatory environment in which it is undertaking its current UFB FTTH deployment. That experience is directly relevant to informing the real world constraints on network deployment that an HNE would face.

374 In broad overview, Chorus' experience in relation to UFB deployment illustrates that, even with its own existing pole network:

374.1 In urban areas, obtaining consent to aerial deployment, in particular aerial deployment of distribution network, is a significant challenge. Chorus' experience is that consents for more than 20% of premises passed is unlikely to be achieved;

374.2 The costs and time investment of obtaining necessary regulatory consents to facilitate aerial deployment are significant. In the case of deployment of UFB in

Auckland, Chorus has been required to obtain a total of 34 resource consents and three certificates of compliance to enable aerial distribution. It is expected to take over a year at an estimated cost of approximately **[ ]** to achieve these consents (even in the absence of Environment Court appeals or other legal challenges). A similar consenting process is expected for Wellington;

374.3 The costs of complying with conditions on network deployment can also be material. Conditions on Chorus' consent are likely to impose annual costs of at least approximately **[ ]**.

375 Chorus acknowledges that its experience in relation to UFB deployment is limited to urban areas. In contrast, the HNE will be required to deploy network nationally, in all urban and rural areas in which end users are situated.

376 To provide a comprehensive expert assessment of the regulatory environment for aerial deployment in New Zealand, Chorus has engaged Chris Horne BA (Geog), MRRP, MNZPI from Incite to provide a report and expert opinion on the likelihood of an HNE obtaining all necessary approvals under the RMA to deploy a FTTH aerial network throughout New Zealand. We have also sought Mr Horne's advice on the likely time and cost, in necessarily approximate terms, associated with obtaining any statutory approvals.

377 Mr Horne's report is **attached** to these submissions. In brief summary, Mr Horne's conclusions are:

377.1 Based on his experiences to date with leading Chorus' RMA consent programme for UFB, in his opinion the best approach for a new operator to consent a new aerial network would be to limit it to areas where there are already existing aerial networks (e.g. electricity lines networks) that can be utilised;

377.2 Seeking to deploy a completely new aerial lines network would, in his view, not be practical, as it would be unlikely to be granted resource consents;

377.3 While consenting of aerial networks using existing pole infrastructure where not otherwise permitted is achievable, there may be significant costs and time delays to achieve this in some areas. Further, compromises in deployment methodologies to achieve consent may require a proportion of underground deployment in any event;

377.4 Generally speaking, under the RMA regime it would be easier to consent underground infrastructure. However, this said there will be exceptions where there are heritage/Maori values considerations where earthworks are not desirable.

378 The first two points are significant, given the assumption that an HNE will not have access to poles currently owned by Chorus.

Availability of existing infrastructure

The existing pole networks

379 The existing network of street poles in New Zealand is, with limited exceptions, owned by Chorus and electricity distribution companies (or lines companies). The existing pole networks are traditionally on opposite sides of the street. On streets with only one set of poles (for example, some hill streets), typically either Chorus or the lines company will own the poles.

380 A very small number of poles in discrete areas of the country are also owned by other third parties (such as Wellington Cable Car Limited).

381 The quality of the pole networks owned by Chorus and lines companies depends on their historical usage and maintenance. Quality varies considerably from location to location, even within the same region or area.

382 Electricity lines company poles are generally used for electricity distribution (the communal lines running along the street) and service leads (the line from the street to the house). In addition, in some areas lines companies have also deployed either their own or third party fibre distribution lines on their pole networks. An example of the latter is the use of electricity poles for the aerial deployment of the Vodafone cable network in Wellington.

383 Chorus has its own network of poles that are predominately used for service leads rather than distribution. Given this historical usage, the poles used generally have a lower carrying capacity and are shorter than electricity company poles. Due to this, a substantial investment in pole replacement and new infill poles would be required to enable Chorus to use its own poles for distribution and as a result Chorus' preference is often to use electricity company poles for distribution.

384 Neither Chorus' own pole network nor the pole networks of distribution companies are ubiquitous. In particular, most local authorities now require utilities in new subdivisions to be deployed underground rather than aerially. This means that significant areas of New Zealand now exist where no existing pole infrastructure (either telecommunications or electricity distribution) exists. Chorus estimates that this is around **[ ]**% of route lengths.

Capacity constraints

385 The addition of fibre cables to pre-existing copper and electricity cables causes additional stresses upon pole structure, and can compromise stability. This is particularly true where poles are required to carry the weight of distribution cables (rather than service leads). In certain areas with older equipment or poles designed for service leads and not distribution, poles may not be structurally capable of bearing the weight of extra cables.

386 The capacity of existing poles to take additional cables will depend on the existing design, age and maintenance history of the infrastructure. There is no comprehensive set of information that identifies which poles have capacity to bear the weight of additional cables.

387 To enable aerial deployment on existing poles therefore requires specific investigation and testing, in some cases on a pole by pole basis, to ensure that the poles can bear the weight and stresses of the additional cables. This cost is invariably a feature of the contractual arrangements for access to third party poles, and is a cost borne by the access seeker. These terms are discussed further, below.

388 If a pole is found not to be capable of supporting the additional cables required, the network operator must choose either to replace the pole or to deploy the network underground in that location. In Chorus' experience, the cost of replacing the pole will always be borne by the access seeker where that upgrade results solely from Chorus' additional requirements, and will often be borne by Chorus regardless of whether or not the upgrade is the result of Chorus' requirements. Accordingly the choice of replacement or underground deployment will depend (assuming regulatory consents to aerial deployment can be obtained) on the number of poles that must be replaced in a particular location, and thus the relative cost of aerial and underground deployment.

389 While Chorus is actively undertaking investigations of pole capacity in a number of areas in relation to UFB, there is insufficient data at this stage to provide actual figures about the number of poles requiring replacement in areas where aerial deployment of distribution network is contemplated. However, Chorus anticipates on the basis of consultation with lines companies and Chorus' own experience with the copper network that between **[ ]** and **[ ]**% of poles that Chorus proposes to use for aerial deployment will require replacement. Chorus has budgeted that **[ ]** in every **[ ]** poles will be required to be replaced.

Obtaining access to third party poles

Existing rights and arrangements for copper network

390 The history of telecommunications and electricity pole networks, and their traditional deployment on opposite sides of the street, led to the development of an informal arrangement on use of poles for service leads.

391 To extend copper cables to houses on the other side of the street Chorus must extend lines to, and service leads from, poles owned by the relevant lines company (and the lines company must do the same on Chorus' poles). Where only one set of poles exist, both parties will typically use the poles for both distribution and service leads under these reciprocal arrangements.

392 This "gentlemen's agreement" remains in place for service leads on Chorus' copper network. Similarly, Chorus allows access to its pole network to enable electricity lines companies to deploy electricity service leads. These agreements do not typically allow one party to use the other's poles for distribution.

393 In addition, s155 of the Telecommunications Act 2001, provides Chorus with "existing use" rights to maintain existing works or existing lines that are fixed to, or installed over or under, land that is not owned by the operator. Chorus has therefore also been able to rely on this statutory protection of its existing network.

Chorus' experience in negotiating access to poles for deployment of new fibre network

394 Chorus' recent experience in negotiating access to third party poles for deployment of a FTTN network is directly relevant evidence of the circumstances of an HNE.

395 At the start of the UFB project, a number of lines companies took the view that, as fibre was a new network, no existing use rights or previous arrangements applied to fibre deployment of either service leads or distribution network.

396 Given the potential for material disruption to the UFB project, Chorus elected to negotiate new agreements with the lines companies for future use of poles, rather than to test the existence, or otherwise, of the potential application of existing use rights it may or may not have held.

397 In these negotiations, Chorus was in an equivalent or better position to an HNE seeking to deploy a fibre network using access to poles. That is because an HNE would not have potential (but untested) existing use rights in any negotiations with pole owners. Further, other than in limited cases, such as Wellington or where a lines company has its own telecommunications network, Chorus did not have to directly compete for access to poles with an existing fibre network. In contrast, an HNE seeking to overbuild UFB would face this additional constraint.

Overview of commercial environment

398 The key lessons from Chorus' experience are that:

398.1 The process of negotiating access to third party assets takes significant time and effort. Chorus' own negotiations with each lines company have taken on average **[ ]** to complete, and some are ongoing. This is itself a planning constraint – in the absence of certain access, aerial deployment may not be able to be realistically considered for short to medium term deployments given planning and construction timeframes;

398.2 Not all lines companies are prepared to agree to aerial deployment of distribution network, as opposed to aerial deployment of service leads. However, most companies will accept aerial deployment of distribution network subject to appropriate commercial terms and capacity issues;

398.3 Bill and keep arrangements are generally not achievable in practice, and Chorus does not presently have any. To the extent that Chorus' "gentlemen's agreements" for lead ins amount to bill and keep arrangements, these would not be achievable for an HNE, which would have no poles for lines companies to use for electricity lead-ins given regulatory constraints on pole deployment; and

398.4 Existing poles are capacity constrained and, even if access can be secured, aerial deployment may not be able to be achieved without significant testing of existing infrastructure and, if necessary, replacement (at Chorus' cost).

399 These positions reflect commercial reality in New Zealand. Lines companies face a number of additional costs associated with the accommodation of further utilities. These costs include:

399.1 Assessment and potentially replacement of poles to enable them to carry extra loads;

399.2 The cost associated with the work to add extra cables to poles, including rearranging already existing leads and attachments;

399.3 Additional administrative costs;

399.4 Increased ongoing operational and maintenance costs to manage access to and maintenance of poles and access seeker equipment on an ongoing basis; and

399.5 Increased operational and maintenance costs as a result of increased structural load.

400 Lines companies must either bear these costs or pass them on to the party seeking access to the poles.

401 Lines companies must also minimise a number of risks, including risk to their own electricity networks, and the health and safety risks for contractors undertaking the associated work. The last decade has seen the adoption of a significant number of health and safety reforms, including director liability for breaches of the Health and Safety in Employment Act 1992. In Chorus' experience, lines companies are significantly more cautious about the implications of Chorus' proposed commercial agreements upon their health and safety obligations. In turn, this has increased the complexity of the commercial negotiations.

Complexity and time to conclude access arrangements

402 Given the lack of precedent for this type of use arrangement in New Zealand, the process of negotiating access to third party assets has taken significant time and effort.

403 This is itself a planning constraint – in the absence of certain access, aerial deployment may not be able to be realistically considered for short to medium term deployments given planning and construction timeframes. Typically, Chorus must complete designs 12 months in advance of construction. In some situations, extended negotiations have forced Chorus to abandon plans for aerial deployment and focus on underground deployment instead.

Commercial terms

404 Chorus has concluded **[ ]** access arrangements with lines companies for access to poles. These have been disclosed to the Commission under a section 98 notice. Chorus has ongoing negotiations with a number of other lines companies which are yet to reach a formal agreement.

405 These contracts are managed by a team of experts within Chorus which reflects the complexity of the commercial terms. The particular terms vary between the

agreements, reflecting the varying positions of the lines companies with which Chorus is negotiating, but have a number of common features discussed below.

406 Chorus considers it is appropriate to use these in the Commission's model. That appears to be common regulatory practice. For example the regulator in Sweden has stated:[131]

> The bottom-up model should use the equipment prices that an efficient operator with the bargaining power of an SMP operator in Sweden would be able to obtain. However, for many assets used in a telecom network there are no recognised market prices; instead if an operator wishes to acquire an asset it will engage in private bilateral negotiations with one or more suppliers. Consequently, the bottom-up model will have to rely on operators providing information on the prices they have paid to acquire a given type of equipment. These may be documented with reference to price lists or contracts and corrected for SMP bargaining power. Naturally, such bargaining power adjustments will only be applied to prices provided from operators other than the SMP operator and where a price-volume relationship can be established and documented. No correction should be made unless it can be clearly documented.
>
> It must be demonstrated that the prices collected are appropriate. For example, that prices represent a number of recent contracts and must not be the results of any extraordinary discounts. Equipment prices may include prices for bundled products as long as all the products are related to the modelled network.
>
> There may be difference in timing between when an asset becomes operational and when it is paid. Therefore, account may be taken of this by capitalising the interest payable in the meantime.

(A) Nature of deployment: service leads or distribution

407 In most cases, Chorus has been able to negotiate the use of poles for distribution (subject to capacity constraints, regulatory consents, and agreement on commercial terms).

408 However, in some areas (such as Wellington), Chorus has been able to negotiate the use of poles for service leads only. Lines companies have not been prepared to agree to use of the poles for distribution. In these cases, Chorus must underground distribution cables, although it can then use the poles for service leads.

(B) Access fees

409 The terms negotiated by Chorus include an annual fee per pole of between:

409.1 **[ ]** per pole for service leads only, which is CPI adjusted; and

409.2 **[ ]** per pole for service leads and distribution, which is CPI adjusted.

[131] Swedish Post and Telecom Authority "Draft Model Reference Paper Guidelines for the LRIC bottom-up and top-down models" (4 February 2010) at [14.1].

(C) Pole testing and replacement

410 As discussed above it is necessary for Chorus (or the lines company) to identify at-risk poles or areas,[132] test poles to ensure that each is capable of bearing the weight of additional cables, and repair or replace affected poles.

411 **[**

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412 Costs of testing and replacement are carried out **[**

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413 The cost of testing poles is approximately $**[** **]** per pole. The cost of replacing a pole owned by a lines company is approximately $**[** **]** per pole.

414 Chorus must pay the cost of testing poles before it is able to make a final decision about whether aerial deployment will be feasible in the circumstances, taking into account the number of poles that will require maintenance or replacement in order to bear the stress of additional cables.

(D) Other relevant terms

415 In addition to the above terms, Chorus generally bears a number of other costs under the access agreements. Examples of typical terms imposing costs upon Chorus include, variously:

[

[132] Under some agreements, Chorus must in fact bear the cost of testing every pole that it proposes to use**, [** **]**.

].

APPENDIX 4: TRANSACTIONAL CHARGES

416 The Commission is required to set the following transactional charges.

417 Core charges in the scope of the FPP include prices for new connections, transfers and other core charges as set out in Schedule 2 to the UBA STD. They exclude sundry charges that Chorus is required to review annually, passing through changes in labour or input costs by increasing or decreasing the charges.

Product	Service Component	Description
UCLL	1.1 MPF New Connection	The establishment of a new service instance of the MPF Service (i.e. there is no MPF Transfer). The service is established from spares or intact circuits with an existing service lead into the building. That is, it utilises an existing MPF that is not currently used for the provision of telecommunications services.
UCLL	1.2 MPF Transfer	The transfer of the MPF Service connected to an End-user's premises from one Access Seeker to another, as authorised by the End-user.
UCLL	1.3 Other Service to MPF Transfer	The transfer of an End-user from services (other than the MPF Service) provided over Chorus' Local Loop Network to an MPF Service, as authorised by the End User.
UCLL	1.7 MPF Relinquishment	Where the Access Seeker terminates supply of the MPF Service in respect of a particular Access Seeker's End-user. This entails Chorus updating its records and billing. Chorus may either physically disconnect the MPF at any point between the exchange and the End-user's premises or leave the MPF circuit intact.
UBA	1.1 UBA Service New Connection, any instance	The establishment of a new service instance of the UBA Service (i.e. there is no UBA change plan). The UBA service is without POTS and where the upstream speed is unrestricted.
UBA	1.9 Other broadband service (including UBS) to any UBA service plan.	The change plan of an End-user from broadband services (other than the UBA Service) provided over Chorus's Network to any UBA service, as authorised by the End-user.
UBA	1.10 Any UBA service to any other UBA service change plan	The change plan of an End-user from any UBA Service to any other UBA service (including, until three years after Separation Day, any change to a UBA service with or without

		POTS), as authorised by the End-user.
UBA	1.31 Transfer of Basic UBA Service from an Access Seeker to a Basic UBA Service with another Access Seeker	The transfer of a Basic UBA Service with one Access Seeker to a Basic UBA Service with another Access Seeker, as authorised by the End-user.
UBA	1.32 Transfer of Basic UBA Service from an Access Seeker to an Enhanced UBA Service with another Access Seeker.	The transfer of a Basic UBA Service with one Access Seeker to an Enhanced UBA Service with another Access Seeker, as authorised by the End-user.
UBA	1.33 Transfer of Enhanced UBA Service from an Access Seeker to a Basic UBA Service with another Access Seeker.	The transfer of an Enhanced UBA Service with one Access Seeker to a Basic UBA Service with another Access Seeker, as authorised by the End-user.
UBA	1.34 Transfer of Enhanced UBA Service from an Access Seeker to an Enhanced UBA Service with another Access Seeker.	The transfer of an Enhanced UBA Service with one Access Seeker to an Enhanced UBA Service with another Access Seeker, as authorised by the End-user.
UBA	1.35 Transfer of other broadband service from an Access Seeker to a Basic UBA Service with another Access Seeker.	The transfer of a broadband service (other than the UBA Service) provided over Chorus's Network with one Access Seeker to a Basic UBA Service with another Access Seeker, as authorised by the End-user.
UBA	1.36 Transfer of other broadband service from an Access Seeker to an Enhanced UBA Service with another Access Seeker.	The transfer of a broadband service (other than the UBA Service) provided over Chorus's Network with one Access Seeker to an Enhanced UBA Service with another Access Seeker, as authorised by the End-user.
UBA	1.39 UBA Service Relinquishment	Where the Access Seeker terminates supply of the UBA Service in respect of a particular Access Seeker's End-user. This entails Chorus updating its records and billing. Chorus may either physically disconnect the UBA at any point between the exchange and the End-user's premises or leave the MPF circuit intact.

UBA	1.40 UBA Service Move Address.	This is the switching of the data interleaving. The default setting is on for the Basic Service and high for Enhanced Services. End-users can ask their Access Seeker to have interleaving turned off (for the Basic Service) or low (for Enhanced Services) in relation to services provided over the UBA Service.
UBA	1.41 Data Interleaving Toggle.	This is the switching of the data interleaving. The default setting is on for the Basic Service and high for Enhanced Services. End-users can ask their Access Seeker to have interleaving turned off (for the Basic Service) or low (for Enhanced Services) in relation to services provided over the UBA Service.