



Process and issues paper for determining a TSLRIC UCLL price

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Summary

The Commission's task in this process is to apply the FPP in the Act – and that means the forward looking TSLRIC costs of the access network.

In parallel, the Commission has issued an RFP seeking proposals from expert advisors to help the Commission develop economic cost models for the UCLL and UBA services. That process anticipates further reference papers defining model principles and inputs. We support the Commission's proposed approach and anticipation of further detailed consultation.

Accordingly, we focus in this submission on the key principles that will inform how the Commission might frame the cost model requirements.

The Act requires the Commission to estimate forward looking costs of the service

The socially desirable outcomes of forward looking methodology, such as TSLRIC, are well understood and applied in many jurisdictions. TSLRIC forward looking costs seek to provide efficient signals to providers, access seekers and consumers - encouraging and rewarding efficient investment, use of the infrastructure by access seekers, and ultimately to provide consumers services at lowest cost. These efficient signals are best estimated by the forward looking costs of an efficient provider using modern technology – a competitive market standard.

As explained by Frontier in the attached report, regulatory authorities have taken different approaches to the modelling of these forward looking costs. These differing approaches reflect the different statutory frameworks, national circumstances and balancing of TSLRIC outcomes. Likewise, the Commission faces methodological choices that must be consistent with the FPP pricing principle, the statutory framework and, within that, make choices in the long run interests of end users.

That said, there is an emerging trend in this area – helpfully codified in the European Commission's most recent recommendations for the local loop costing methodology to be applied by European regulators.

This means estimating the costs of an efficient provider, recognising existing reusable assets such as ducts

The Commission is faced with applying this model in a market where technology change and increasing consumer data demand means that operators are now rolling out high capacity 4G mobile and fibre networks. These networks are proof positive that no operator would today roll out a copper network.

Along with this fundamental market transition is a growing recognition that some reused assets – such as ducts and poles - are unlikely to be replaced or replicated. The Commission should estimate the costs of an efficient provider building a modern network that recognises the reuse of these assets. As explained in the Frontier report, applying a replacement cost methodology to these assets simply results in a windfall revaluation gain to the provider, and can discourage investment in future oriented assets. Frontier advises that these assets should be valued using a methodology that recognises the value derived from these assets in previous periods as depreciated cost. This is

consistent with the European Commission's recommended approach to next generation networks and the approach taken the Commerce Commission, and affirmed by the High Court, in the Part IV input methodologies process.

It is unclear whether the choice of copper or fibre MEA is material. Frontier advises that the Commission has a choice, in areas where fixed wireless is not preferred modern technology, a fibre to the node (**FTTN**) or fibre to the home (**FTTH**) technologies are available to the Commission. We support the Commission's preliminary view that it estimate the efficient costs of a FTTH and fixed wireless networks. This best reflects the New Zealand environment – with FTTH networks currently in deployment – and provides important efficient signals for operators and customers. If we were to apply the EC recommendation, this would suggest a fibre GPON network.

A TSLRIC model is seeking to signal efficient costs. Therefore, irrespective of the MEA, the Commission should adopt a bottom up model that identifies a hypothetical efficient operators costs – avoiding embedding past or promoting future inefficiencies. This is the package of settings that provide the efficient cost signals that underpin a forward looking pricing principle and is consistent with section 18.

The current framework requires a single price

We support the Commission's view in paragraph 30 of the issues paper that it is most appropriate to model the full UCLL network as the UCLL price flows through to services that run over both cabinetised and non-cabinetised lines and the costs are shared between the services. The Commission's paper does not however explicitly consider whether it should then set separate prices for the services that share this network (UCLL, UCLF and the access network uplift component of the UBA service) or maintain the current, whole-of-network averaged pricing approach. This is a significant question that warrants early consideration.

This should be a simple question:

- A decision to model and set a single nationally averaged price for these services is consistent with the current application of the Act, protects the coherence of the regulatory framework and provides sensible investment incentives on access providers and access seekers. It allows New Zealand to continue to regulate UCLL at a full-loop price (our current UCLL price is a full-loop price) in the same way as other OECD jurisdictions; or
- A decision to disaggregate the costs of the access network into separate prices for these services will irrevocably alter those incentives in ways never contemplated by Parliament and, importantly, will create a logical incompatibility in the regulatory framework currently encapsulated in the Act. It would require New Zealand to shift UCLL pricing from a full-loop basis to a non-cabinetised price. There is no international precedent for this approach.

Imagine for present purposes that the Commission interpreted the Act as requiring it to limit UCLL costs to the costs of non-cabinetised lines, while applying an average of cabinetised line costs + non-cabinetised lines to the UCLF and UBA services. This interpretation would result in a geographically de-averaged UCLL price and a geographically averaged UCLF and UBA price.

Quite apart from the clear disconnect with the explicit 2011 Government policy of created averaged regulated prices, the two pricing structures would be logically incompatible in policy and reality. If we imagine for present purposes that this resulted in a lower UCLL price than the UCLF price, in that scenario, access seekers would naturally shift demand to the lower input service wherever it was available, and purchase the averaged UCLF service everywhere else. This would by definition result in the combination of the UCLL and UCLF prices either under-recovering the full costs of the local loop network or (if you considered it possible for the UCLF pricing principle to only reflect the costs of those lines it was purchased on) a complete de-averaging of regulated local access network pricing. This must be a nonsensical interpretation of the Act. If Parliament had intended it, if it really meant for New Zealand to depart from every international UCLL precedent and carve its own unique de-linked path - it would have expressed it in much clearer language than exists in the current Act.

But in fact, the Government's policy discussions in the lead-up to the Amendment Act made it clear its intent was the opposite – for the UCLL and UCLF prices to be linked and averaged and for this price to represent the local access network uplift to the UBA price. The Commission's UCLFS determination and UCLL benchmarking review also supported this interpretation; and parties' commercial dealings reflect the same view.

Finally, we note that the question of whether, and to what extent, the UBA FPP process can or should sensibly be progressed on a separate timeline to the UCLL FPP also likely turns on the Commission's approach to this issue. If the interpretation we favour is followed, then the UBA service may well be able to be modelled quite simply as an overlay to the UCLL model. If a different interpretation is taken though, this raises material questions as to whether some of those local access network costs should be allocated directly to the UBA service

Backdating

The international evidence we have before us suggests the current UCLL IPP price is higher than we might expect. It sits comfortably above typical European UCLL prices. This would in turn suggest that retail service providers are the most likely beneficiaries of a decision to backdate the outcome of this TSLRIC pricing process. Be that as it may, we have a very clear view that backdating of this decision would not serve the best interests of end-users or the industry. We recommend an early decision on this matter by the Commission, in order to provide certainty to all parties.

We do not know what UCLL price will result from this process: any party that suggests it does is naïve or bluffing. We do, however, know from the rigorous analysis of this question during both the UCLL price benchmarking review and the UBA price review, that New Zealand is not fundamentally different to European jurisdictions in any major cost-driving respect – or at least not so different as to think we should sit materially outside the observable range of European prices for this service. This process may prove that we are different in 10,000 small ways, and as a result we have materially higher UCLL costs than every single one of those other OECD countries we currently look to as comparable benchmarks but as we enter into it, we see no evidence to suggest this. In fact, the European Community – representing a diverse group of states of widely varying characteristics – has set a tight target range for this service of just €8-€10 – or NZD\$13.26-\$16.58 using 10 year PPP and exchange rates.

If we imagine for these purposes that this process ended with a price at the top of that range, backdated to the commencement of the process (December 2012) that would result in a backdating award against Chorus of approximately [[TNZRI]] if the process were to be completed over the next 18 months. In the current climate, that could simply exacerbate the financial pressures Chorus faces, leading to the likelihood of further commercial and political uncertainty for all parties. The retrospective and lump-sum nature of this award would mean flow-through to end-users would inevitably happen only in a non-transparent, indirect way. We do not believe this is a supportable outcome.

Similarly, if the award were reversed, and levied against retail service providers, we could quite conceivably see smaller providers exit retail markets. Innovation would unquestionably be curtailed, and retail prices would have to rise. Again, this outcome appears unsupportable.

In the meantime, with each of these scenarios theoretically plausible, all parties would be forced to conserve capital, reduce innovation and risk-taking for the course of the FPP process. These are exactly the opposite behaviours the Act tells the Commission to protect and encourage.

Introduction

1. Telecom welcomes the opportunity to comment on the Commission's UCLL final pricing principle (FPP) issues and process paper (**issues paper**).
2. We are mindful that, to assist in the parallel UBA and UCLL processes underway, the Commission has sought proposals from expert advisors to help it develop economic cost models for the UCLL and UBA services. Further model requirements and principle papers will be prepared as part of that process. We support the Commission's proposed use of external, experienced experts to assist this complex process by defining the methodology, building the TSLRIC model, and assessing model parameters and inputs. We also encourage the Commission to continue to adopt a broad consultative approach with stakeholders and experts as the process evolves to ensure that the models are suited to New Zealand.
3. The design, parameters and inputs of a TSLRIC model cannot be finalised in isolation from each other. Therefore, it is not possible to finalise the approach to particular issues until the full context is agreed through the anticipated reference papers. Therefore, in this submission, we focus on the key choices faced by the Commission that will determine its approach to work such experts will do and underpin the reference papers and cost models.
4. The TSLRIC long run forward looking standard is a commonly applied regulatory approach that aims to provide efficient signals for access providers, wholesale customers and ultimately consumers. While the efficient forward looking standard is well understood and must be applied by the Commission, there are a number of independent methodological choices relating to how it models these costs. A number of these choices can only be considered in the anticipated reference papers. However, at this early stage, the Commission will need to consider the high level principles it intends to apply:
 - a. What are the requirements of the TSLRIC pricing principle that the Commission is seeking to apply?
 - b. What does the efficient forward looking standard imply when determining the modern equivalent asset (**MEA**) that would be deployed and efficient costs?
 - c. How should it value existing reusable civil engineering assets - such as ducts and poles – which are unlikely to be replicated?
 - d. What approach should the Commission take to the backdating of an FPP price?
 - e. Whether the Commission should seek to unpick the current full network pricing framework to establish specific prices?
5. We focus on these issues below. Responses to the specific questions set out in the issues paper are set out in the second part of our submission.

TSLRIC pricing objectives

TSLRIC reflects the forward looking costs of an efficient provider

6. In determining the FPP price for UCLL the Commission must use TSLRIC - a forward looking cost-based pricing methodology. The definition in Schedule 1 of the Act is:

TSLRIC, in relation to a telecommunications service, —

(a) means the forward-looking costs over the long run of the total quantity of the facilities and functions that are directly attributable to, or reasonably identifiable as incremental to, the service, taking into account the service provider's provision of other telecommunications services; and

(b) includes a reasonable allocation of forward-looking common costs.

7. The forward looking standard is an established and mainstream approach to establishing the costs of regulated services.
8. As noted in the issues paper, the underlying rationale for a TSLRIC based approach is to provide efficient signals to providers, access seekers and consumers:
 - a. Encouraging and rewarding efficient investment by access providers, while minimising the cost of providing services;
 - b. Providing efficient signals for wholesale customers to use the existing infrastructure, and make complementary investments to maximise use of the infrastructure; and
 - c. Ultimately, providing efficient signals to end consumers to use services supported by the infrastructure.
9. If we were to reflect these together into a single simple policy objective underpinning the UCLL pricing principle, it would be that setting prices on the basis of forward looking costs is expected to generate outcomes consistent with what we would see in competitive markets, and best promote the long term interests of end users. A key principle underlying the economics of public policy is that parties will make social welfare-enhancing decisions if they are faced with the full costs and benefits of those decisions.¹
10. To provide efficient signals, the relevant costs are those being efficiently incurred. The Commission noted in its TSLRIC discussion paper that the requirement to consider efficiencies and the approach taken in other jurisdictions, has resulted in a view that forward-looking costs and efficiently incurred costs are typically used synonymously.²

¹ Frontier Economics report for the Commission 2002

² Para 32 TSLRIC discussion paper. Para 186 Regulatory Practice note 2009.

11. In other words, the TSLRIC pricing principle seeks to replicate the cost signals that we expect to see in competitive markets and, in building a UCLL cost model, the Commission must - first - make choices that results in its best estimate of these efficient forward looking costs. It's these efficient signals that promote dynamic efficiency and are in the long term interests of end users.
12. Accordingly, the network functionality and costs are determined by the hypothetical efficient network, not the incumbent provider or the existing service definitions. This is the only way that the efficient competitive market cost signals being sought can be achieved. Tailoring the model too tightly to a particular provider – whether that be Chorus or a new entrant – undermines the efficient cost signals of the TSLRIC standard. Equally, a hypothetical network model which is too distant from the reality of the New Zealand telecommunications environment will deliver inefficient cost signals. The Commission's choices are of crucial importance.

Applying the TSLRIC pricing principles to the New Zealand context

13. Frontier notes in its advice that, within the TSLRIC framework, regulators have taken different approaches to establishing efficient costs. These approaches reflect the legislative framework and relative balancing of price signals in the national circumstances.
14. The Commission faces similar choices in the methodology used to identify the forward looking costs of the services. It needs to make these choices in light of the TSLRIC pricing principle, the circumstances of the New Zealand environment and, within the FPP, the purposes of section 18 and the Act. This requires drawing on overseas experience, regulatory and legal precedent from related sectors and our environment.
15. The TSLRIC principles are being applied in the context of significant technology and customer change. Like many overseas markets, the New Zealand market is changing rapidly:
 - a. There is significant technology change. Modern fibre networks and 4G mobile networks are being deployed and delivering significantly more services than today's copper network;
 - b. Customers are demanding increasingly higher bandwidth services to support a range of new content and applications. While early days in New Zealand, operators in more mature markets are seeing 40% take up of fibre based internet services;³ and
 - c. Chorus has entered into arrangements with the Crown to, amongst other things, minimise investment in the existing copper network while rolling out a Crown subsidised FTTH network.
16. In this context it appears obvious that no operator would now look to build the network we have today. This market and technology transition creates practical difficulties for estimating forward

³ For example, see <http://www.fiercetelecom.com/story/verizon-bucks-q3-seasonal-trend-fios-drives-wireline-revenues-37b/2013-10-17>

looking costs. For example, less information is available relating to the modern equivalent network – the roll out of the forward looking network is at an early stage, and the demand and efficient costs of this network is less well known than those of the legacy network.

17. Nonetheless, the efficient cost signals that lie at the heart of a TSLRIC methodology remain. While there might be less focus on alternative providers build/buy decisions (at least in UFB areas), it remains important that efficient pricing signals remain. These signals are important to ensure correct build/buy decisions remain for retail service providers in their choice of input services, and correct incentives are maintained for those providers to invest in complementary infrastructure such as transport infrastructure and innovative application layer services. They are important to ensure Chorus has an incentive to be efficient and to continue to invest efficiently in all areas of its network. Finally, they are also important to ensure consumers see correct price signals, and do not pay inflated prices for monopoly assets.
18. Further, while the market is changing rapidly, this does not imply a fresh start to modelling efficient costs. The policy objectives of forward looking methodologies are well understood and there is, internationally, significant experience available to the Commission for constructing forward looking models. The Commission can also refer to the European Commission for detailed consideration of the implications of a migration to next generation networks. Within this established framework and resources, the key challenge for the Commission is determining the setting that best fit our circumstances.

A fibre and fixed wireless MEA

19. We believe that the choice of modern equivalent asset is a crucial decision in the selection of a model design and approach. As Frontier Economics point out in section 2 of their report, the decisions that the Commission makes on the different critical modelling issues are interdependent. The choice of MEA will condition and be conditioned by the choices made on other aspects of model design and approach within the TSLRIC framework. As a result, we think it makes most sense from the perspective of section 18 to consider not merely the individual choices, but the effect of packages of internally consistent modelling choices.
20. Frontier advises that the Commission has faces a choice in its predominant MEA architecture. In areas where fixed wireless is not preferred modern technology, a fibre to the node (FTTN) or fibre to the home (FTTH) technologies are available to the Commission.
21. We support the Commission's preliminary view that it should estimate the efficient costs of a FTTH and fixed wireless networks. This best reflects the New Zealand environment – with FTTH networks being deployments – and provides important efficient signals for operators and customers. A FTTH network is the modern network in the New Zealand context – this is what is being deployed in practice. We do not yet have a settled view on whether this should be a GPON or point to point network – both options warrant further examination, although we acknowledge that present market evidence suggests GPON may provide the lowest up-front cost.

22. This is also consistent with the EC approach which recommends basing the MEA on the NGA that reflects the national broadband policy.

Efficient forward looking costs, with existing reusable assets at depreciated cost

23. Frontier further advises that a balancing of the TSLRIC objectives in light of today's environment suggests costs based on an efficient the way to provide network services today, taking in to account the existence and utilisation of existing assets. This means recognising that that large parts of the access network will not duplicated and, resetting the values of these assets, can simply result in revaluation gains for Chorus. Frontier propose a differentiated approach whereby re-used existing assets should be valued at the depreciated optimised replacement cost.

24. We support Frontier's proposed approach. It provides a practical means for the Commission to provide for efficient cost signals for both new investment, while avoiding inefficient revaluation gains. Civil engineering assets such as ducts and poles are unlikely to be replaced. There is no obvious benefit to value such assets at replacement cost and, as Frontier note, may actually deter investment in future infrastructure. A replacement cost methodology will hold prices high distorting efficient pricing signals.

25. The Frontier approach also appears consistent with forward looking frameworks applied overseas and in New Zealand. The Commission has recognised that a TSLRIC costing methodology can use a combination of current and historic costs. The Commission noted in its October 2010 submission to the Government review of the Regulatory Implications of Structural Separation that:

***Forward looking (and replacement) costs.** The underlying rationale for valuing assets on a forward looking cost basis is that prices are set on the basis of a hypothetical provider of these services. By basing prices on this basis, the correct pricing signals are given for entry, build or buy decisions.*

[...]

*In practice **TSLRIC** (total service long run incremental costs) can use a combination of these [current and historic cost] elements. Where elements of the cost are subject to realistic replacement, replacement costs can be used, where the costs are sunk, historic costs can be used; another important practical element within this is the identification and attribution of common and fixed costs to prevent double recovery. This is highlighted when considering specific services in isolation (such as UBA).⁴*

26. The European Commission (EC) has adopted a similar approach in its most recent recommendation and the Commission can draw on this work. For example, the EC considered

⁴ See page 27 of Commission response to MED Discussion Document "Regulatory Implications of Structural Separation" October 2010.

over 18 months the issues raised by the transition to fibre networks, and jurisdictions such as Germany are starting to apply these principles. While at an early stage, the Commission can draw on this work and economic experts experienced in applying such models.

27. The EC recommended that regulators adopt a bottom up long run incremental cost approach that calculates the forward-looking costs that an efficient network operator would incur to build a modern NGA network. Under the recommended approach, reusable and unlikely to be replicated civil engineering assets such as ducts, trenches, poles should be valued at indexed depreciated historic cost. The approach recognises the elapsed economic life and thus the costs already recovered by the provider and, while sending efficient signals, avoids the risk of a cost over-recovery for reusable legacy assets.
28. The Commerce Commission and New Zealand courts have also considered the difficulties associated with seeking to apply replacement cost methodologies to existing assets and potential revaluation gains.⁵ This suggests that any approach that simply results in windfall revaluation gains to providers is unlikely to be acceptable in the New Zealand context.

The efficient provider standard

29. A TSLRIC model is seeking to signal efficient costs. Therefore, irrespective of the MEA, the Commission should adopt an approach the best estimates efficient forward costs. This means a bottom up model of a hypothetical efficient provider (that models demand across current and future services).
30. Frontier has advised that the Commission should develop its own bottom up model of the network. This should be a single model capturing all local access demand.
31. The Commission developing its own model results in Commission control over the methodological decisions involved in the modelling exercise and means it can exercise its expert judgment over the internal consistency of those interdependent choices. Further, while the Commission faces a choice between a bottom up and top down model, a bottom-up model is more flexible and requires far fewer qualitative adjustments, relies more on hard quantitative data, and is more likely to reach a more precise estimate of the current cost of delivering the UCLL service using the most modern technology available.
32. A top-down model requires significant judgments to be made and a range of more or less qualitative adjustments in order to approach this level of best practice. In particular, it would rarely be the case that any of the costings relating to the actual network used to deliver the service can be accurately adjusted for an efficient build of the infrastructure required to produce the UCLL service with the most modern technology available. Accordingly, while this approach may appear simpler, the resulting TSLRIC price estimate is normally significantly less precise, and

⁵ See High Court [2013] NZHC 3289 and Court of Appeal (TSO) find references.

the resulting outcome for economically efficient investment, innovation, and competition is less effective.

33. We support the Commission developing its own bottom up model. The Act requires the Commission to identify the forward looking costs to provide the service and, in practice, to do this robustly requires detailed cost modelling. In our circumstances, the Commission should apply a bottom up model:
- a. As set out above, in New Zealand we believe the policy focus is on sending efficient cost signals and the only way to do this in a robust and transparent fashion is via a bottom up model ;
 - b. In practice, there is no reliable accounting data from which to estimate forward network costs. There is nothing to adjust; and
 - c. The framework of the Act requires a robust model of the type produced by a bottom-up model. Our Act provides for an IPP to calculate a “quick proxy” for a bottom-up cost modelled price. A top-down approach would risk simply repeating this step.
34. Further, a single modelled perspective of cost and demand over all services better reflects the nature of modern networks where there are significant common costs to be shared across all services irrespective of the network models (for example, common civil engineering costs make up between 60% and 80% of total costs).
35. Further, Frontier’s proposed approach is consistent with the Commission’s TSLRIC discussion paper approach where it concluded that a bottom up approach, appropriately implemented, is more likely to result in more accurate estimates of TSLRIC than a top down approach, more consistent with the Act, generally preferred by overseas regulators, is more transparent and raises less concerns over access to information.⁶
36. There are no short cuts to setting TSLRIC costs. The Act requires the Commission to identify the forward looking costs to provide the service and, in practice, to do this robustly requires detailed cost modelling. The only reliable way to estimate the costs of an efficient operator is to use a bottom up costing methodology.

Approach to backdating and process at the end of the pricing period

Backdating would not best serve the long term interests of end users

37. The Commission is responsible for the operation of the regulatory framework in the manner that best serves end-users’ long term interests. Industry participants must also share that responsibility.

⁶ Reference para 100.

38. Due to the magnitude of the sums involved in this price review, we recognise that backdating can be seen to represent an enticing opportunity for one party or another to realise a windfall gain. The purpose of the Act, though, is not to provide individual parties with windfall gains. In fact, that is the very antithesis of its purpose.
39. Telecom acknowledges and understands well the size of the prize potentially available to it were this process to result in a substantial decrease in regulated prices from their IPP levels. We understand equally well though, the flip-side of that coin: the harm that outcome would create elsewhere in our market structure. And vice versa.
40. Accordingly we think that the Commission should exercise the discretion afforded it to refrain from implementing a backdated price, and provide this view clearly and early in this process. The spectre of backdating and the resulting uncertainty would likely chill competitive activity during the FPP process, deliver significant shocks to revenues and expenditure of access seekers and access provider and, ultimately, be less efficient and less likely to give best effect to the section 18 purpose.
41. We are familiar with the 2006 Court of Appeal decision referred to by the Commission in the issues paper.⁷ We recognise that the decision in *Telecom* could be read as supporting a general principle that a FPP determination should be backdated. However, we think that a better reading endorses the Commission's discretion to depart from any obligation to backdate the FPP price. It is important to recognise the distinction between the type of process underway in 2006 and accordingly the circumstances in the Court's contemplation at the time of that decision, and the circumstances before the Commission in this present process. Importantly, in *Telecom* the Court appears to have been heavily influenced by the fact that the section 27 determination under consideration would only be effective for a reasonably short duration, related to a price to be set between two parties, and related to a FPP price that was known to be lower than the IPP price.
42. In that case, the Court considered that the section 18 purpose could be somewhat frustrated if the FPP price was not backdated, given the relatively short period of time a FPP price could be left to apply if it was only implemented after the series of appeals. In this case, the Commission has the power to determine the duration for which the FPP price will apply once the FPP price is determined ensuring that it will be in effect for a reasonable period of time.
43. In *Telecom* the FPP price would be effective between only two parties. The court was not required to give consideration to the potential chilling effect on the broader industry of awaiting an uncertain future result which could be backdated. In reality the court's emphasis appeared to be on the backdating of a lower FPP price. Its assumption appears to have been that a lower price obtainable under the FPP would be more efficient and must be backdated to enable the Access Seeker to deliver the competitive benefits to the market. In this case, as a matter of principle however, we must consider that the FPP price could be either lower or higher than the

⁷ *Telecom v Commerce Commission and Telstra Clear Limited 2006 (Court of Appeal)*

IPP price. And a higher price, if backdated could would impact all RSPs ability to offer competitive services and could result in smaller RSPs having to exit the market.

44. We see as somewhat instructive in the court’s reasoning, the direction that the issue of backdating should be determined with reference to whether backdating, in the particular circumstances, best gives effect to the section 18 purpose in the Act. Relevant to the circumstance in this case, include the following:
- a. The STD price does not simply apply between two parties, but it applies to all access seekers and Chorus, therefore the effect of any backdating would be felt right across the range of stakeholders.
 - b. The Commission has the power to set a long expiry date for the FPP determined price and therefore has the ability to avoid the FPP applying only for a short period in a way that frustrates any efficiency gain it may produce.
 - c. An outcome that reduced the competitive market structure would be bad for competition. In the first instance, because of the uncertainty introduced by the prospect of backdating, RSPs could be forced to hold potentially large financial reserves to cater for the potential for a future pricing shock. This would without question have a dampening effect on competitive activity. Further, because a number of RSPs may be unable to tolerate any material upward backdating of the UCLL, UCLFS and UBA prices it is possible that backdating could cause smaller RSPs to exit the market due to this financial shock.;
 - d. Similarly, Backdating of a price decrease could exacerbate the financial concerns Chorus has already highlighted it will experience when the UBA price comes into effect, leading to a further round of political and industry uncertainty as Chorus and stakeholders worked-through potential mitigation actions.

These scenarios and effects are unsupportable. Backdating in this context can be clearly distinguished from the finding of the Appeal Court in *Telecom* and should be ruled out as early in this process as possible.

Providing for prices at the expiry of the STD

45. The Commission has also asked for comments on an additional paper discussing what occurs at the expiry of the review.
46. While the wording of the Act is not entirely clear, it is evident that the Commission has broad powers under section 30R to review, at any time, of all or any of the terms of the terms specified in a STD (s 30R). An interpretation that permits a practical and workable pricing regime to endure should be favoured. In that regard we think that the Commission should be able to update a future price using its section 30R powers or to extend the time frame for the application of the price.

47. It may also be possible for the commission to, under section 59, extend the expiry date and possibly also update the pricing at that time if there's a change of circumstances. It may also be possible now to build in a mechanism to automatically or periodically update the FPP price.
48. This is a matter which probably warrants closer attention. But we think that nothing turns on its early determination and we would suggest greater engagement with parties on this issue at a later stage in the process.

Whether to unpick the current full network pricing framework

The current framework requires a single price

49. We support the Commission's view in paragraph 30 of the issues paper that it is most appropriate to model the full UCLL network as the UCLL price flows through to services that run over both cabinetised and non-cabinetised lines and the costs are shared between the services.
50. The Commission's paper did not, however, address the significant question of whether, having modelled the full UCLL network, it should disaggregate the costs of this network into different UCLL and UCLF prices (and conceivably, a separate UBA local access network uplift price). This is a defining question that –as with backdating - requires an early decision from the Commission.
51. Our statutory framework has been designed and operated around a single unbundled copper access price as the basis for the UCLL, UCLF and UBA services. Government's policy discussions in the lead-up to the Amendment Act made that relatively clear, the Commission's UCLFS determination and UCLL price re-benchmarking review each recognised this; and parties' commercial dealings reflect the same view.
52. In fact, the coherence of the regulatory framework depends on this foundational approach to layer 1 pricing. While we readily acknowledge that the statutory drafting is not as clear as it might otherwise be, any interpretation that de-links or disaggregates these prices logically unravels the regulatory framework set out in our Act - it breaks it in a way that can never have been contemplated.

Averaging requires a full network price

53. When the relevant service descriptions and pricing principles were enacted in 2011, the very clear Parliamentary intent was to provide for nationally averaged pricing of regulated services. This was a deliberate shift away from the prevailing de-averaged pricing model.
54. At the same time, the UCLF service was added to the Act with a demonstrable intention that pricing for the service would be linked to the UCLL service of the time. The policy intent behind UCLFS pricing was that Telecom, while prohibited from taking UCLL, would not be advantaged or disadvantaged relative to access seekers taking UCLL – a form of competitive neutrality.

55. The Government's stated objective in fact was:⁸

[...] in amending the access regime is to translate, as closely as possible, the status quo into the new structurally separated environment. [18]

56. The preceding MED September 2010 discussion paper sets out the reasons for the proposed approach. Officials initially proposed that a new voice access service would be necessary as DSLAMs and PSTN assets would be operated by different companies – it would be at the UCLL price when taken on a standalone basis.⁹ Conversely, Telecom proposed in its submission a baseband service (reflecting that the service would be delivered over multiple technologies) priced equal to the new averaged UCLL price [107].¹⁰

57. The proposed approach was approved by Cabinet in December 2010 and noted in the supporting regulatory impact statement to the proposals.¹¹

58. Officials subsequently reported to the select committee that:

- a. The UBA price should be set using the cost-building block methodology building on existing cost-based UCLL prices. The additional cost blocks should be based on TSLRIC. Officials considered that:

This provides the most certainty for the industry because it uses:

*a UCLL prices, which are prices that are both bench marked against forward-looking cost-based priced and **actually applying in the market**; and*

b TSLRIC, which is a widely applied and understood regulatory methodology used to price other cost-based services in the Act. [para 29]¹² [Emphasis added]

- b. The UCLFS price was linked to the UCLL service [page 66].¹³

59. The intent was to make it clear that the minimum changes be made to the existing pricing framework and that the price of UCLL and UCLFS would be the same – even though the UCLFS would only use the lower frequencies of the line and not the full frequencies available to UCLL. Up until the point at which UCLF service was incorporated into the Act there had never been any

⁸ Cabinet Paper Slevel5.1R-11021607560 13 December 2010

⁹ <http://www.med.govt.nz/sectors-industries/technology-communication/pdf-docs-library/communications/telecom-separation/regulatory-implications-of-structural-separation-september-2010.pdf>

¹⁰ <http://www.med.govt.nz/sectors-industries/technology-communication/pdf-docs-library/communications/telecom-separation/submissions/telecom-structural-separation-submission-telecom.pdf>

¹¹ See RIS provided to select committee <http://www.parliament.nz/resource/0000171267>

¹² See RIS above.

¹³ See response to Telecom question at page 66. Officials advice to select committee <http://www.parliament.nz/resource/0000171233>

discussion by the policy makers on a separation of the local loop for the purpose of price setting. Had they intended that to take place we would have expected clear policy positions and explicit drafting to that effect.

De-linked or disaggregated costs and prices can never have been contemplated

60. While we consider that a number of inconsistencies in the statutory drafting of the relevant service descriptions and pricing principles are unhelpful, we also recognise that the Act has been drafted in a piecemeal fashion as regulatory layering has occurred. It would be wrong, however, to elevate relatively minor drafting inconsistencies to a point where they become legally determinative of competitive outcomes in the market that could clearly never have been intended.
61. Separate prices for UCLL and UCLFS (and conceivably for the local access network uplift to the UBA service) **must** result in a logical incompatibility in the regulatory framework that would ultimately render it unworkable. Let us assume for a minute that the UCLL price was set with reference only to the costs of non-cabinetised lines, while the UCLF service price was set with reference to the averaged costs of the full local loop network – that is, cabinetised and non-cabinetised lines. Then let us assume the UCLL price arrived at in this scenario is lower than the UCLF price.
62. The result would be two partially substitutable services – one priced on a de-averaged basis, the other on an averaged basis. Ignoring the clear incongruity of this outcome with the clear 2011 policy attempt to shift to averaged pricing, it should be self-evident by now what the problem would be – access seekers would purchase the cheaper de-averaged input wherever possible, and the averaged UCLF service everywhere else.
63. The logical consequence must be one of two eventualities:
 - a. If the UCLF service price is unable to be adjusted to reflect the shift in demand off it on lower-cost loops (it is not at all clear from the pricing principle that this would be possible) then Chorus must be definition under-recover the forward-looking costs of its local loop network; or
 - b. If the UCLF service price is able to be adjusted to reflect the shift in demand off it on lower-cost loops, then we end up with a perfect de-averaging of regulated local access services – the precise opposite to what Parliament intended and the requirement in clause 4A of Schedule 1 that the UCLL price is a single geographically averaged price.
64. Neither of these outcomes is supportable; no sensible reading of the Act or the policy can justify either. The Act can and should be interpreted as requiring a single, averaged, regulated access network price for UCLL, UCLF and the UBA uplift. If Parliament had intended any other policy outcome they would have expressed that in clear, unambiguous, considered and specific language – which they did not.
65. Elevating inconsistent drafting to a level where it takes upon a whole new legal and operative meaning would be a misinterpretation of Parliament’s intent and be inconsistent with the

general understanding of all stakeholders at the time of the enactment and even at the time when the UCLFS determination was made.

The Commission should resolve this early in the process

66. Given the significant and serious impact a de-linked approach would have for our industry, we need an early steer from the Commission on how it will approach this design question.
67. Similarly, the same clarity is required in order for the Commission to properly determine whether it can make UBA FPP decisions on a separate timeline to its UCLL FPP process. Under a de-linked approach it seems likely that the local access costs associated with cabinetised lines will need to be allocated in some fashion between the UCLF and UBA services. There is no international precedent we are aware of for this exercise, so we simply do not know what this exercise may involve. However it is quite conceivable that this exercise may well influence the UBA FPP price, suggesting it would be very difficult to separate that pricing process from this one.
68. In our view, given the commercial, policy and legislative intent appears to be a tight link between the UCLL price and UCLFS, UBA and SLU it makes sense to run the UBA and UCLL processes together and to leverage a single, common approach in the TSLRIC exercise when determining the UCLL price for each.
69. Our preference is to resolve this early in the process because, if it does decide to unpick the current pricing relativities, it will add significant complexity to the modelling process. A single price across all access services hides a significant degree of complexity.
70. For example, if we were to de-link, then the Commission would need to address:
 - a. The allocations between local access services of shared infrastructure. There are significant shared costs – such as the duct network – and these will need to be allocated across all services. The Commission will need to determine an appropriate allocation key for local access services and apply;
 - b. Develop service specific demand forecasts by component used, i.e. demand over cabinetised versus non-cabinetised lines;
 - c. Consider the implications for the UBA FPP. The Commission has proposed to develop a UBA FPP incremental to the full network cost. We support the Commission proposed approach. However, UBA can only be progressed – more or less - independently to UCLL if the UCLL designated service captures the full network costs.
71. This is because the UBA service is the additional TSLRIC costs from the access network. The UCLL price reflects the full network costs. However, if the UCLL designated service was something less than this - by, say, excluding cabinet backhaul – then the excluded costs would need to be considered incremental to the UBA service.

72. While this could be considered a transfer within the UCLL plus UBA price stack (and therefore having little impact on Chorus revenue of consumer prices), we won't know whether it is a one for one transfer until the cost allocation exercise referred to above has been completed.
73. However, the Commission also needs a general framework for the process. There are a number of linkages within the pricing review process and the Act and, unless the Commission takes a consistent approach, the process will be difficult and uncertain.

Commission questions

Question 1: *We are interested in your views on the appropriate length of the regulatory period for a UCLL FPP price.*

1. While it is open to the Commission to determine the appropriate length of the regulatory period, we recommend that the Commission's first scheduled review be at the end of 2019 and conducted together with the consideration of the Commission's approach to fibre.
2. We suggest also that the Commission should "lock" UCLL pricing for a period of three years following its final FPP determination. During this period, it could monitor UCLL pricing during the regulatory period and, if the Commission's monitoring process discloses a material divergence from efficient pricing prior at this point it could implement a s30R review to re-set the pricing at that point. If a material divergence is not suggested by this monitoring, then the price would remain constant for the five year period. In this context we would propose that "material divergence" would be a change of more than 15% in the UCLL FPP price
3. Section 52(f) of the Act requires a price determination to have an expiry date. In addition, the Act requires the STD to be reviewed every five years. We believe that setting a planned price reset scheduled to run together with the fibre reconsideration process at the end of 2019 would comply with that requirement. The Commission could then set a regulatory period expiring subsequent to a realistic estimate of the end of the STD review and price reset process.

Question 2: *To what extent should the Commission update the assumptions of the cost based prices at each reset?*

4. We think the UCLL price monitoring process proposed above could be wrapped into the Commission's other market monitoring activities. Depending on the final choice of the modern equivalent asset (MEA) modelled in the TSLRIC model, different issues may need to be considered.
5. A well-constructed forward looking pricing model makes implicit or explicit assumptions about the long run levels of demand, costs, risks, and technological change, and indirectly, a range of macro-economic parameters affecting the costs of the service. When prices are reset, generally they should be based on more accurate forecasting of long run volumes and forward looking costs
6. The assumptions to be monitored, tested, and if necessary updated are likely to be limited to those which individually and cumulatively materially influence the modelled price. Where there are substantial deviations between the forward looking long run assumptions of matters expected at the time that the model was built, and those which would be made at the time of review, adjustments should be considered to those assumptions.
7. Broadly, one might expect it would be necessary to monitor long run forward looking assumptions about the trajectory of demand, of unit costs, cost of capital parameters, technological change and economic depreciation and similar factors.

The specifics are likely to be dependent on the actual structure of the model, the implicit and explicit modelling assumptions, and the MEA employed.

8. To summarise at a high level, the assumptions to be retested on a price review will likely include, but may not be limited to the following issues:
 - a. Changes in demand: The assumption that the demand curve implicit in the model does not shift inward or outward over the term of regulation.
 - b. Changes in price: The assumption that the prices for the services being offered which, in a highly leveraged industry characterised by largely irrevocable sunk costs play an important role in profitability, will decrease over time as initially modelled, (due to changes in substitute or complementary products or services, changes in end-user preference, etc.);
 - c. Changes in estimate of capital required to provide total service: All capital invested at the time at which the model notionally is built will be used over the entire economic life of the assets at full capacity;
 - d. Changes in the economic life of the assets modelled: A TSLRIC model should apply economic depreciation (or a substitute which best approximates it such as an annuity with both a price and output tilt), to the assets used to construct the modern equivalent asset modelled. Technological change in the economic life of the modelled assets between price resets may affect the approach to modelling the forward looking economic life, [(e.g. xDSLx technologies extended the economic life of copper access network assets)].
 - e. Changes in the WACC for the UCLL segment of Chorus business The WACC selected for use in the model dictates the recovery of non-avoidable variable and fixed costs, which in a highly leveraged industry represents a large proportion of the return on and of the capital invested will not vary over the term of regulation;
 - f. Changes in the modern equivalent asset: The assumption that no new technology will become available over the term of regulation which leads to lower costs of producing the regulated service.
9. In practice, we understand that the approach taken by other regulators in relation to changes in assumptions generally has been for regulated firms to bear the risk of changes in all, but a limited range of, material uncontrollable variations.

Question 3: Which considerations are relevant in resetting a TSLRIC based price?

10. We believe that the overriding consideration in resetting a TSLRIC based price should be economic efficiency. A TSLRIC-based price is intended to replicate as far as possible in a regulated setting the long-run outcomes which would be delivered by a competitive market.
11. In the past, various approaches to forward looking long run incremental pricing have been used by regulatory authorities to open telecommunications markets to competition. In many cases, the importance of introducing competition has been a paramount consideration, and the focus of TSLRIC modelling has been on ensuring

access pricing which promotes market entry in situations where there has been no effective competition.

12. In a competitive market in the long run, the value-creating assets used in the production process by an access provider will earn a return on and of the capital employed to the extent that they represent the assets and activities which would be deployed and carried out by an economically efficient access provider.
13. In other words, prices in competitive markets will tend in the long run to converge at the level that covers current forward looking rather than historic capital costs, particularly for the value-creating assets used to deliver the relevant services¹⁴.
14. In markets such as telecommunications, characterised by entry costs and extensive economies of scale and scope, long-run prices fall between long-run incremental costs and long run stand-alone costs. A properly constructed forward looking long run incremental cost model will provide economic incentives to promote efficient market entry and investment by access seekers, and efficient investment and innovation, and return on investment for access providers without over-reward or penalty.
15. The principal purpose of resetting a TSLRIC –based price is to ensure that the price continues to replicate, as closely as reasonable, the long run outcomes which would be delivered by a competitive market.

Question 4: What role should NPV neutrality play in price resets?

16. When the Commission carries out the price reset process, it is normal practice when using a TSLRIC model to set prices based on the costs in the model such that there is a return on and of the capital employed over the economic lifetime of the assets. This approach implies that the model structure will be NPV neutral at the outset. NPV neutrality is less relevant for existing assets at the start of the regulatory period. This is because it is impossible to determine the recovery over the preceding period.
17. As noted in our response to Question 2 above, a TSLRIC model makes implicit or explicit assumptions about the long run levels of demand, costs, risks, and technological change, and indirectly, a range of macro-economic parameters affecting the costs of the service.
18. The actual values which are realised in respect of those initial assumptions may turn out to differ from the initial forward looking assumptions modelled. Where this is the case, NPV neutrality may not be realised in practice. While it is theoretically possible to retrospectively adjust for departures from NPV neutrality at least two important difficulties arise.

¹⁴ The return on those assets which support the value creating assets but which do not primarily contribute to value tend in the long run to earn a return which covers historic capital costs over their economic life but typically does not recover either their current or forward looking capital cost. An example might be trenches or ducts which house the value creating assets.

19. First, any retrospective amendment undermines the benefits of certainty, stability and predictability for all market participants. Where annuities, and particularly tilted annuities are reset, strict NPV neutrality is only possible by retrospective amendment.
20. Second, adjustments of this type reduce the incentives for Chorus to innovate in order to outperform the efficiency improvements reflected in a well-constructed TSLRIC model, and dependent on the choice of MEA.
21. In practice, we understand that the approach taken by other regulators generally has been for regulated firms to bear the risk of departures from NPV neutrality arising from all but a range of material uncontrollable deviations.
22. Chorus provides a range of differing designated and regulated services, regulated on different bases, and also offers a range of unregulated commercial variants. Chorus also has a range of contractual arrangements with other third parties, including Crown Fibre Holdings. On a firm wide, rather than a standalone service basis, these arrangements offer Chorus a degree of financial security and reduce the risk of a NPV<0 outcome. In this situation it is difficult to see that the Commission can form a sufficiently adequate view of Chorus' forward looking revenues, profits, and cashflows to make a financeability adjustment.
23. In respect of the UCLL FPP process, the Telecommunications Act seems to clearly set out the matters that the Commission must consider in setting a TSLRIC price – namely to model the forward looking costs for the UCLL service over the long run of the total quantity of the facilities and functions that are directly attributable to the service, taking account of the production of other telecommunications services and allocating a reasonable portion of forward looking common costs. We do not believe the language of section 18 operates to override or modify that requirement. We do not consider that the Commission has a mandate to consider departing from NPV neutrality based on financeability in the context of the UCLL FPP.

Question 5: Does the Commission have discretion to depart from a backdating of the FPP price?

Question 6: If so, are there section 18 factors (or other factors) relevant to the UCLL FPP which tell against backdating?

24. We respond to Questions 5 and 6 together. As discussed above, we think that the Commission has the discretion to refrain from backdating. We identified a number of key differences between the legal regime in the *Telecom* case and this matter. Ultimately we consider that the Court of Appeal's decision emphasised that any decision to backdate should turn on whether backdating is the most efficient outcome and whether that is likely to best give effect to section 18.
25. In this case we think the factors against backdating outweigh any pro-competitive benefit that could be gained by backdating.

26. In the *Telecom* case¹⁵, when the Court stated that an FPP price is assumed to be more efficient than an IPP price it did not actually conduct an explicit efficiency exercise. It was not persuaded on the arguments and evidence put to it that there were any efficiency considerations which militated against Further the Court explicitly stated in paragraph [44] there was no requirement to consider in any depth any countervailing factors going to efficiency considerations.
27. In the present situation, the facts appear to us to differ sufficiently from that case. The explicit consideration of section 18 by the Court and balancing of the efficiency outcomes suggests that the efficiency considerations should guide the exercise of the Commission's discretion on whether to backdate. Factors such as the impact on smaller retail competitors, stability and predictability in the market should weigh heavily.
28. Backdating also sits uncomfortably with forward-looking pricing and a forward-looking view of investment, innovation and competitive markets.
29. The purpose of a forward looking pricing principle is to provide efficient investment and competition signals. Backdating is less relevant for these signals because, by its nature, it is backward looking. Therefore, the question on backdating is not really a pricing policy issue that goes to the heart of setting a forward looking price.

Backdating – factual and counterfactual

30. A material number of investment decisions in the telecommunications sector require that significant, largely irrevocable sunk costs must be incurred in advance of actual demand, and that these decisions result in limitations on the scope of future decision-making. In other words in the telecommunications sector, the exercise of a real option to invest at a given time not only bears material risk, but extinguishes a range of other real options. In this regard, for regulated access providers, and access seekers, key risks are associated with both regulatory commitment and regulatory certainty.
31. As a result, the backdating decision for the Commission represents an assessment of the section 18 benefits arising from the two likely outcomes:
32. Deferred short term efficiencies through backdating price changes until the end of the UCLL FPP process which will mean that the access seeker, in response to the intensity competition at the retail level, passes as much as possible of the pricing changes through to end-users as quickly as possible; and on the other hand
33. Immediate short and long term efficiencies providing benefit to end-users by ensuring that access providers, and access seekers are incentivised to continue to make investments and to innovate for the long term benefit of end-users.

Qualitative assessment of the future benefits to end-users under the factual and counterfactual

¹⁵ *Telecom v Commerce Commission and Telstra Clear Limited 2006 (Court of Appeal)*

34. As noted elsewhere in our response, regulated prices effectively freeze the ability of both access providers, and access seekers to adjust the pace and timing of investment and innovation based on price signals between reviews. In a competitive market this micro-economic adjustment process takes place continuously as market participants determine what adjustments are made to avoidable variable and fixed costs, or to price or non-price terms or the structure of their market offering in response to the scope or nature of changing economic factors within the framework of sunk and irreversible costs already incurred.
35. In relation to backdating, the key implication for all parties is that the longer the delay between legal implementation date of a price change and the later decision date in respect of the relevant, the greater the regulatory uncertainty, the impact on market participant's investment choices, and the costs associated with cash management, financial reporting, management and operational management (particularly where the delay spans financial years and reporting dates), and the practical difficulties of readjusting wholesale prices.
36. There is evidence from studies carried out in other jurisdictions that a delay in the outcomes of regulatory decision making also carries a social cost. For example, in *Valuing the Effect of Regulation on New Services in Telecommunications*¹⁶ Professor Jerry Hausman estimated that the twelve year delay by the Federal Communications Commission in allowing the Bell operating companies to offer voice messaging from 1989 onwards had a value of USD 1.27 billion US dollars per year. In relation to the regulatory delay in the introduction of cell phone services in the United States between the early 1970's and 1983, Professor Hausman estimated the cost to consumers to be closer to USD 100 billion in total with more than USD 25 million in a single year.
37. The combination of uncertainty, risk, and increased cost, mean that the ability of access seekers to pass through the effect of backdated price changes to consumers will be limited, and importantly that investment decisions will be deferred wherever possible. The outcome of this will likely either, in the case of a price reduction, that an access seeker will defer investment until it has certainty of the benefit it will have, in which case there is a welfare cost to end-users of delayed benefit from access seeker innovation, or in the case of an upward price change that capital is inefficiently used to ensure that either cash reserves or borrowing facilities remain available until such time as a final liability can be ascertained. A symmetric problem is faced by the access provider in terms of uncertainty.
38. In short, the longer the period between the legal implementation date, and the final determination date, the total welfare costs of backdating increase. The social cost of deferred investment by both access seekers and access providers may well outweigh the social benefit of passing through backdated changes in price.

¹⁶ Hausman, Jerry A., Ariel Pakes, and Gregory L. Rosston. "Valuing the effect of regulation on new services in telecommunications." *Brookings papers on economic activity. Microeconomics* 1997 (1997): 1-54.

Question 7: To what extent is the impact of any backdating of prices likely to be limited to downward price revisions given the price determination sets a price cap from which Chorus has the ability to levy charges at a lower level?

39. While in some ways it is an attractive proposition to suggest that even if a regulated price cap is backdated that does not enable the Access Provider to actually backdate the higher price charged to access seekers we think the better – more responsible – approach is for the Commission to refrain from backdating, should make that decision early and in that way, avoid the chilling effect of backdating uncertainty.

Question 8: If we backdate the UCLL FPP price, can we consider ways to mitigate the impacts of backdating, and if so, how should we do this and what practical considerations should we take in to account?

40. It does seem to be difficult to mitigate the impact of backdating. Any decision to backdate could be limited in duration – to say a 3 month period, with room for gradual adjustments of re-payments over a forward-looking twelve month period. But this would ultimately not sufficiently mitigate the potential chilling effect a decision to backdate would have.
41. For the reasons set out above, the expectation or not of backdating will have significant impact on Chorus and RSPs. It will delay efficiency initiatives or customer benefiting price changes:
42. There will be a significant holding cost for RSPs. Some will be seriously effected by a material change in price and backdating. It will increase the risk of reducing costs to customers;
43. Alternatively, Chorus and CFH may not make the very necessary changes on an expectation (that may or may not be correct).

Question 9: What role should section 18 play in an FPP TSLRIC modelling exercise?

General comments

44. When the Commission carries out an FPP TSLRIC modelling exercise it is required to deliver a best estimate of the efficient forward looking costs to provide the service. Since the best estimate of the efficient forward looking cost of the service is the best estimate of the cost which would be reached in a competitive market, (for the reasons set out in our detailed responses to other questions), it is consistent with section 18 considerations. Therefore the impact of section 18 is relevant only to the selection of internally consistent methodological and modelling choices in the construction of a TSLRIC model and determination of a UCLL FPP price.
45. Section 18 considerations are important to every determination the Commission makes and a FPP determination is no different. But, when you consider the way that the Act is constructed, it is reasonable to assume, as the court did in *Telecom*, that the FPP is the most efficient way to determine a price for a designated access service. Accordingly, a comprehensive and conventional application of the TSLRIC methodology would be give effect to the section 18 purpose.

46. From an economic perspective, setting a price that allows recovery of efficient costs is the best way to promote competition and efficiency. In *Wellington International Airport Limited v Commerce Commission*¹⁷ the Court recognised that if a regulated entity is allowed to charge prices that allow it to recover efficient costs, then efficient outcomes will follow – such as investment, limiting excess profits, and so forth. The court stated:

[20 - 21] ... the prices that tend to be generated in workably competitive markets will provide incentives for efficient investment and for innovation. The same tendencies towards prices based on efficient costs and reasonable rates of return will lead also to improved efficiency, provision of services reflecting consumer demands, sharing of the benefits of efficiency gains with consumers, and limited ability to extract excessive profits.

... and

[29] A key output of Part 4 regulation is prices, the prices that regulated businesses charge for their services. In workably competitive markets, prices are the manifestation of market outcomes: that is, the outcomes of the process of competitive rivalry and of the interaction between supply and demand. It is prices that provide signals to suppliers to innovate and invest. It is prices that determine profits. In each case, of course, prices interact with demand and expected demand. Markets where there is little or no competition do not produce price outcomes that are consistent with the outcomes to be promoted in the s 52A(1) purpose. It is the difficult role of Part 4 regulation to produce prices that generate the s 52A(1)(a) to (d) outcomes, consistent with the outcomes produced in workably competitive markets. Prices are, therefore, at the heart of Part 4 regulation.

47. Although the provisions are not the same, there are some similarities between section 18 and part 4. As a matter of principle, the Commission can take significant guidance from the Court's reasoning. That is, setting a TSLRIC cost-based price is most likely to give effect to the competitive outcomes desired in telecommunications markets. Even Chorus' FPP application highlighted that their objective was for the Commission to determine a price that better reflected cost than IPP price.
48. When applying the FPP the Commission will need to exercise judgement at various points. In doing so it should be realistic about the extent to which section 18 directs or controls those individual decisions. In many cases the nature of the judgement to be exercised means that section 18 won't point to a particular answer - rather, the principles from section 18 are just a factor to be taken into account when considering the exercise of judgement.
49. Section 19 directs the Commission to make the determination that it considers best gives effect to section 18. Although all of the specific decisions through the process will impact on the assessment of whether the determination best gives effect to section 18, that is not the same as saying that each and every specific decision must be made to best give effect to section 18. Rather, the overall outcome from the process should, in the Commission's view, give the best effect to section 18.

¹⁷ *Wellington International Airport Limited v Commerce Commission* [2013] NZHC 3289

50. The Commission needs to limit any weight placed on arguments that section 18 requires that the UCLL price must incorporate a premium to somehow subsidise investments in fibre (or other new products) because a bias towards fibre is more likely to facilitate dynamic efficiency and innovation. Arguments that require the Commission to set a higher price for the regulated UCLL service to fund or favour investment in other services are economically flawed.
51. Setting a price based on most accurate estimate of efficient costs of the regulated service should provide all the right incentives for other investments and innovation. Investing in new services primarily depends on the return on the new services. This rationale applies even if the concern is about fibre product uptake by customers. Making sure they are paying the "right" price for copper should provide all the right incentives in terms of choosing alternative options (which of course assumes the "right" price is set for fibre and other options).
52. That said, if section 18 does provide guidance for any particular decision, then it is appropriate for the Commission to be so guided.

Section 18 – emphasis on outcomes in a competitive market

53. Section 18 emphasises the promotion of competition in telecommunication markets by means of regulation of certain telecommunication services for the long-term benefit of end-users (LTBEU) of telecommunication services.

Promoting competition or competitive market outcomes

54. At a policy level, ex ante regulation in telecommunications is appropriate where market power means that price is, or is likely to be, held above the aggregate of long run marginal cost and an appropriate level of common cost recovery. The presence of actual competition, or the threat of competition in a contestable market, is arguably the single most powerful economic influence on prices and outputs. In other words, competitive pressures are the most influential determinant of the elasticity of demand for products and services by end-users.
55. From an economic perspective, the long term benefit of end-users of telecommunications services in New Zealand, absent non-economic considerations, is best served by the provision of services at the lowest possible economic cost, when the utility of those services, (e.g. including user preferences, quality of services and economic and non-economic costs borne on end-users) are taken into account.
56. In relation to telecommunications markets, the Telecommunications Act provides for ex ante regulation to promote competition, (and by extension, to approximate competitive outcomes where competition does not take place), by providing an appropriate degree of contestability in the market). Section 18(2) directs the regulator to consider efficiencies in its decision-making process.
57. We strongly believe that to best give effect to the LTBEU purpose the Commission should ensure that it exercises its expert judgment to approximate as closely as possible long run economic efficiency in setting the UCLL FPP price at the best estimate of economic cost. This consideration arises both at the level of individual decisions during the process, and the cumulative effect of those decisions when formally finalising Commission decisions in a determination.

58. Section 18 in the context of the UCLL FPP process, and in the development of a TSLRIC model should also be read as a neutral direction to the Commission to ensure that it ensures economically efficient incentives for both Chorus and RSPs as access seekers, materially similar to those which they would face in competitive markets, with consequent long term benefits for end-users

Question 10: What section 18 considerations should we take into account in the following respects: model design and approach; the determination or selection of individual parameters in the TSLRIC cost model; and in selecting a UCLL FPP price?

Using section 18 to guide decisions as to the modelling process.

59. For the reasons set out in the introductory section and our response to Question 9, we think that a the best reading of section 18 and the construction of a TSLRIC model, (as that term is defined in the Act), provides an approach which is consistent with section 18, and in particular section 18(2A). The development of forward looking cost based methodologies such as TSLRIC, and the associated regulatory modelling processes took place during the first phase of telecommunications reform under which access to telecommunications infrastructure and the promotion of competition through market entry was a paramount consideration.
60. Subsequent developments in the practical implementation of forward looking cost based modelling continue to take place. A recent example is the European Commission recommendation to National Regulatory Authorities¹⁸ which details cost methodologies recommended for reusable legacy civil engineering assets.
61. The Commission can exercise its judgment in designing the model by continuing to take account of the experience of other regulators who have developed forward looking long run cost models, and in continuing to take advice from experienced international telecommunications cost modelling advisory firms.
62. In making decisions regarding model inputs or design, the Commission should be guided by the need to ensure that the model reflects the forward-looking costs of the efficient MEA network, taking into account international best practice and practical considerations. As noted, this would achieve the outcomes of promoting competition and dynamic efficiency, so that the Commission need not alter the inputs or structure of the TSLRIC model in pursuit of its objectives.
63. We would be concerned if the Commission were to apply section 18 in a way which did not reflect the objective of long run competitive market outcomes (i.e. long run economic efficiency) as practically expressed by the ACCC view expressed in paragraph 58 of the Commission's paper. This could take place, for instance when building a TSLRIC model in which the inputs or structure were altered materially from those associated with those of an efficient MEA network. Such an approach can have adverse consequences. This is firstly because the impact of any such

¹⁸ *Commission Recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment*; European Commission.

changes is not always predictable. Secondly the process is not likely to be fully transparent to participants in the process and particularly to outsiders. Finally, a the actual real world value of the TSLRIC price for the UCLL service will not be known and cannot be used as a reference point.

Modern equivalent asset

64. We believe that the choice of modern equivalent asset is a crucial decision in the selection of a model design and approach. As Frontier Economics point out in section 2 of their report, the decisions that the Commission makes on the different critical modelling issues are interdependent. The choice of MEA will condition and be conditioned by the choices made on other aspects of model design and approach within the TSLRIC framework. As a result, we think it makes most sense from the perspective of section 18 to consider not merely the individual choices, but the effect of packages of internally consistent modelling choices.
65. It is well known that the provision of telecommunications infrastructure requires investment in a range of assets with high sunk costs. Many of the assets such as the physical network and associated electronics represent irreversible investments, in respect of which components such as cable and electronics are typically characterised by decreasing replacement costs for the same utility, while other assets such as ducts, trenches and buildings, are capable of re-use, have longer economic lives, are unlikely to be replicated, are characterised by rising replacement costs, and have alternative possible uses.
66. From an economic perspective, in a competitive telecommunications market, prices tend in the long run to be set at the level that covers current capital costs required to provide the assets that deliver the service as opposed to the historic costs incurred in previous time periods – in other words the notion of the modern equivalent asset reflected in forward looking cost based methodologies such as TSLRIC.
67. In respect of a service such as UCLL or UBA, we think the modern equivalent asset is (and its component parts are) best characterised as the substitute asset which would expected to be in general use in the short to medium term by telecommunications network providers, of comparable utility, adjusted for obsolescence (including physical deterioration, functional (technological) obsolescence and economic (external) obsolescence). This could likely mean for instance that some assets making up the modern equivalent asset such as ducts and trenches may well be legacy civil engineering assets making up a part of the modern equivalent asset but at a value adjusted for economic depreciation to account for obsolescence as described in this paragraph. Frontier Economics propose an approach to this issue in section 2.4.1 of their paper.
68. This formulation is consistent with the lessons learnt from past experience by regulators¹⁹, and with the objectives set out by the European Commission in its

¹⁹ Frontier Economics provide some material in relation to the Australian experience with TSLRIC modelling at section 3.7.1

recommendation to National Regulatory Authorities²⁰ in relation to non-core-value-creating assets such as legacy civil engineering infrastructure.

69. If the UCLL price is set in excess of TSLRIC this could be expected to have the following effects:
- a. The costs to access seekers of copper based services (UCLL and UBA) would be higher than if prices were set equal to TSLRIC. We note in this regard though, that excess returns on copper services would deliver powerful incentives on Chorus to maintain demand for those services. These incentives would for example, reduce Chorus' willingness to lower fibre service prices. This in turn means that retail prices would be higher, which would have an adverse impact on consumers;
 - b. Chorus's revenues would be higher, thereby providing it with more funds for investment; and
 - c. Migration from copper to fibre would be accelerated due to incentives placed on access seekers by regulation rather than by consumer preferences. We think that if this is to be the case it should be a policy choice mandated by Government. As we read section 18, the wider Act, and related legislation, we cannot see that this would be within the Commission's power.
70. We note that any acceleration of migration from fibre to copper might well also be driven because the price of fibre is set through the government's contracts with Chorus, and so is unlikely to increase with an increase in the price of copper. Indeed, in the absence of the fixed contracted prices, retail fibre prices might have increased, since what holds them down is the price of copper based services. If the UCLL FPP process was to set the copper price above TSLRIC, this accelerated migration may well also not be consistent with economic efficiency, and with the long term benefit of end-users.
71. Extreme care would need to be taken by the Commission if it were to conclude that it should set the price of UCLL above TSLRIC. Careful account would need to be taken of the risk of unintended consequences, and it seems to us unlikely to have a desirable impact, particularly given that Chorus receives a government investment subsidy based on network roll out.
72. Equally, if the UCLL price is set below TSLRIC this could be expected to have the inverse of the effects set out above. Although this outcome might be less probable, for similar reasons, extreme care would need to be taken by the Commission it determined that it should set the price of UCLL below TSLRIC.
73. Overall in pursuing the section 18 objectives of promoting competition and LTBEU in connection with the UCLL (and UBA) FPP processes, the Commission should carry

²⁰ *Commission Recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment*; European Commission.

out a TSLRIC modelling and price setting process under which the UCLL, UBA, and other linked related service prices are set at the best estimate of forward looking long run incremental costs with an appropriate contribution to the recovery of common fixed costs. This maintains competitive neutrality for access provider and for and among access seekers and allows copper and fibre to compete on their relative merits for the long term benefit of end-users.

Question 11: What differences in the UCLL and UBA services support different section 18 considerations?

74. It is not clear to us that the differences in UBA and UCLL require the Commission to apply different economic considerations to best give effect to section 18. The underlying consideration must be that setting an efficient cost-based price for UCLL with an efficient cost-based price for the additional components of the UBA service will best facilitate competitive outcomes.
75. We would consider that a price that is not based on cost and deliberately determined to create a bias in favour of one service over the other will be less efficient than one based on cost – which creates the right signals for efficient investment, innovation, pricing and competitive outcomes.
76. We do not think that favouring either service, such as under a ladder of investment approach necessarily does anything to improve the competitive outcomes compared to both services being set at cost.
77. We urge the Commission, in selecting its modelling approach for UCLL, to consider the possible benefits in constructing a model which will be capable of estimating the LRIC costs associated with the UBA service. It seems to us that section 18 considerations mean that estimating the additional TSLRIC costs incurred in providing the UBA service does not necessarily require the Commission to choose a copper based MEA for the UCLL FPP pricing process. More detailed consideration of this issue is dependent on other model design choices.
78. For the reasons set out above, we think that the Commission’s approach should not be to make adjustments to cost-based prices, either for UCLL or UBA, on the basis of section 18 considerations. Rather, we think that section 18 considerations are best met by pricing these services at the best estimate of cost.

Question 12: Having considered section 18 and international approaches to TSLRIC cost modelling, what outcomes should a TSLRIC model selection for UCLL promote in the New Zealand context and why?

79. Our responses to Questions 9 to 11 have set out our views on section 18 issues in some detail. We refer also to the discussion of underlying principles set out in section 2 of the attached report from Frontier Economics for specific comments on international modelling approaches.
80. For the reasons expressed above, in carrying out the UCLL FPP, we think that section 18 considerations are aligned with the principles underlying a forward looking long run incremental cost based approach and that the Commission should exercise care and judgment in commissioning the development of a suitable model in the New

Zealand context. The objectives we think should be promoted in the New Zealand context are that UCLL CPP pricing should as far as is materially possible:

- a. encourage economically efficient investment in infrastructure and provide the access provider with efficient signals for investment and innovation;
- b. provide incentives for minimising the cost of providing services to end-users along the supply chain for both access provider and access seekers;
- c. encourage technology neutral competition between substitutes by encouraging efficient entry and exit by access seekers;
- d. encourage the efficient use of existing and new infrastructure; and ensure cost recovery for efficient infrastructure investment for the access provider.

81. For the reasons set out elsewhere in our responses, these are precisely the incentives which will be created by a regulatory process which replicates the long run prices, and outcomes which a workably competitive market would deliver.

Question 13: Should any of these outcomes be afforded a greater weight and, if so, why?

82. A well-constructed TSLRIC model reflecting the New Zealand setting should estimate the forward looking costs of an efficient MEA access network at a level which evenly preserves incentives for access seekers and the access provider. None of the outcomes set out should be afforded greater weight. Together they replicate the outcomes and incentives created under workable competition for access seekers and access providers in relation to prices and outputs. In any decision on the weighting of outcomes, we suggest that the Commission consider all aspects of efficient pricing and, in accordance with normal practice, consult further on the specifics of reasoning and choices.

Question 14: Do you agree with our interpretation of the components that make up the TSLRIC definition in the Act and if not, what interpretation is more appropriate?

83. The legal definition of TSLRIC is largely informed by economic concepts and thinking. From the perspective of international practice by regulators and telecommunications cost modelling advisors, we think the Commission's interpretation of the different elements of TSLRIC seems appropriate. We note that the key issues and difficulties in modelling do not arise from the approach to the elements of TSLRIC, but rather in the implementation and choice of the sources from which unit costs are drawn, apportionment of joint and shared costs, choices of WACC, and other similar matters.

84. As Frontier Economics make clear in their report in sections 2.1 and 2.2, there is no international consensus on a conclusively superior approach to TSLRIC modelling. Instead, as the Commission has done, the legislation is the best starting point for determining a set of principles that will enable the Commission to choose the appropriate elements of a TSLRIC modelling approach which best meets the objectives set out in the Act. The Commission should use its expert judgment in applying those principles consistent with the requirements of the legislation to select an internally consistent package of TSLRIC modelling choices which best

supports a UCLL FPP price for the long term best interests of end-users of telecommunications services in New Zealand.

Question 15: Is it reasonable for us to account for costs shared with other utilities such as electricity poles?

85. The Commission should take into consideration the possibility that a costs of this type could be shared with other utilities. The TSLRIC approach to cost modelling represents the costs that would be incurred in relation to a hypothetical new access network with the same scale and service scope as Chorus's access network but optimised to some extent for efficiency and expected future demand. If the operator of that hypothetical new network were able to share infrastructure such as poles (or ducts) with other utilities, it would do so if this would reduce its costs. The TSLRIC model should therefore allow for this.
86. The model should also allow for the possibility of the sharing of facilities between utilities when, for example, new green field housing developments or industrial estates are being constructed.
87. The model should also allow for the fact that the cost of exchange buildings is shared between the access and core networks and that the access and core networks can share ducts.

Question 16: Is it appropriate to model demand for a single efficient next generation access network which includes end-users that may migrate to Chorus' fibre network?

88. Telecom considers that it would be appropriate to model demand on this basis. It reflects the actual working of competitive markets in relation to changing demand for services. As noted earlier, prices in competitive markets tend to be set in the long run, at the level that covers current capital costs rather than past capital costs. Current long run incremental costs reflect the social opportunity cost – departures from this involve economic inefficiencies.
89. As noted earlier, a UCLL FPP price based on a TSLRIC model represents the costs that would be incurred by the operator of a hypothetical new access network with the same scale and service scope as Chorus's access network but optimised to some extent for efficiency and expected future demand. This reflects current capital costs, and as a corollary means that all end users should be included, even if they may migrate to Chorus' fibre network.
90. If this were not the case, then as demand for copper falls, modelled UCLL prices would rise (all else equal). As suggested above, this would be in contrast to workably competitive markets, where firms typically lower prices as demand falls for services delivered using older or more costly technology, in an effort to retain market share, rather than raise prices, and are consequently exposed to any windfall losses. Relatedly, Neumann and Vogelsang (2013) suggest that the loss of economies of scale with falling copper demand would lead to higher access charges (if full cost

recovery is taken as a given), which results in incumbents over-recovering their investments.²¹

91. Providers of debt and equity capital to regulated firms, or in this case at least in relation to regulated services, as noted above, neither receive the benefit of windfall gains nor the detriment of windfall losses, but are still exposed to the consequences of management decisions. The function of regulation is to ensure that the regulated service is priced ex ante in an NPV neutral manner, to ensure a return on and of the capital actually invested, and to enable capital to be raised for investment and innovation. Equally, as noted elsewhere, the regulated firm is incentivised to outperform regulatory settings by reducing costs and increasing efficiency in order to retain any gains until the next price reset.
92. Demand, in the UCLL FPP model should be based on all current end-users. If a single efficient next generation access network is modelled as the MEA, then demand shifts from one service to another, and cost allocations for the joint and shared assets move with them, more closely mirroring the effect on prices that would be observable in competitive markets – an outcome more consistent with section 18.

Question 17: Are there any circumstances specific to New Zealand that we should have regard to when deciding whether this modelling choice is appropriate?

93. Question 16 suggests that the hypothetical new network required for the UCLL FPP might be modelled using a single efficient next generation access network. We think it more likely that the choices are between a single efficient next generation fibre access network with some fixed wireless access, or the current FTTH/FTTN/Copper/FWA configuration. In this regard, we think that the Commission should carefully consider that current urbanisation, urban density, and population distributions should be taken into account when considering differences between the actual UCLL network build as opposed to an efficient forward looking network build.
94. As the Commission is aware, urbanisation in New Zealand is of the order of 85% of the population. Although this analysis is only approximate, based on Statistics NZ data urbanised New Zealand population occupies about 2.7% of the useable land area, some 7% of the population occupy rural areas with some urban influence, and amounting to some 14% of the land area, while the remaining 7% occupy more remote rural areas.
95. New Zealand's urban settlements are relatively low density due presumably to the availability of land. Urban population density ranges from approximately 250 to 580 people per square kilometre. This pattern of distribution will affect modelling choices and selection of the MEA. Arguably FWA is more likely to be the MEA for many non-urban end-users rather than fixed access networks largely built prior to the privatisation of Telecom.

²¹ Karl-Heinz Neumann and Ingo Vogelsang (2013), "How to price the unbundled local loop in the transition from copper to fibre access networks?", *Telecommunications Policy*, 37, 893-909.

96. The Commission should carefully consider the most efficient, best-in-use option for providing a modern equivalent fixed (or mobile) wireless access service consistent with the principle set out in paragraph 68 above for the appropriate subset of rural and remote rural users.

Question 18: Should we use a modified scorched node approach in the TSLRIC model for UCLL? What are the advantages and disadvantages of this approach compared to alternative approaches?

97. Telecom thinks that a modified scorched node approach is likely to provide the best approach to estimating the scale and service scope of a hypothetical new network adjusted to meet future demand. Section 3.3 of the Frontier Economics report sets out detailed reasons supporting this position. The preferred approach to scorching in the New Zealand setting is unlikely to be a simple binary choice between scorched earth or scorched node. We believe that a modified approach takes proper account of the following factors:

- a. Depending on the MEA, considering the efficient location of any infrastructure required to meet projected total service demand;
- b. Considering the efficient location of other infrastructure components (such as FWA equipment) using MEA technologies required to meet projected total service demand now;
- c. Considering the costs associated with the efficient build of the infrastructure, including economies of scope and scale available from coordinated build within and across geographies.

98. The advantage of this approach is that it combines the existing scale and scope of the current access network, with the requirement for costing a network deployment suitable to meet forward looking total service demand.

Question 19: What forms of modification should be adopted? What are the advantages and disadvantages of your modification suggestions?

99. The attached report from Frontier Economics sets out in detail the reasons for and basis of applying the modified scorched earth approach the Commission sets out in the Issues Paper. We refer the Commission to sections 2.3, 2.4 and 3.3 of the Frontier Economics report for various elements of that discussion.

Question 20: Please explain the trade-offs between efficiency and 'real-world' considerations in your assessment of the most appropriate approach to modelling the network?

100. For the reasons outlined above, we believe that a UCLL FPP price derived from an appropriate TSLRIC model which represents an efficiently built hypothetical network provides the correct cost based pricing signals to Chorus and to RSPs, in respect of future investment irrespective of technologies. The use of a modified scorched node approach provides a clear link to the "real world" network for which the service is being priced.

101. The use of a bottom-up model validated by reference to selected top-down data from Chorus, together with the choice of a modern equivalent asset and a cautious approach to reusable civil engineering assets is crucial in deriving the most

accurate estimate of the UCLL FPP price, to provide the correct incentives for Chorus, Crown Fibre Holdings, Government, RSPs and end-users in their respective choices on investment in copper and fibre services, the business operations required to support those choices, and the timing of migration to UFB.

Economic efficiency would be adversely affected by a departure from TSLRIC best practice

102. The Commission should be careful when evaluating arguments by affected parties that would see the recovery by Chorus of some part or all of the actual costs of deploying the existing delivery platform for the UCLL service with only limited adjustments for efficiency and the modern equivalent asset. We return to this shortly as the “no optimisation approach”. As noted elsewhere in our response to the Commission’s questions, TSLRIC is not intended solely to provide access seekers with a “make or buy” decision. Instead it is intended to provide economically efficient pricing signals to both access seekers and access providers.
103. A TSLRIC price for the UCLL service should reflect the long run marginal cost of that service at the time of sale, not at some time in the past. Prices in competitive markets, and absent regulation, tend in the long run to be set at the level that covers current costs of providing a service, not the past capital costs, or the current costs of establishing the historic infrastructure used to deliver the service. The same point applies to the assessment of depreciation, and the rate of return. The international best practice in relation to regulatory rate setting using TSLRIC or any of the related long-run marginal cost methodologies is to estimate not the current cost of reproducing the service delivery infrastructure on a copper cable by cable and cabinet by cabinet basis, but to use the current cost of producing the service with the most modern technology available,²² adjusted where necessary for the differences in the utility delivered by the existing technology and specified for the regulated service.
104. A top-down model requires significant judgments to be made and a range of more or less qualitative adjustments in order to approach this level of best practice. In particular, it would rarely be the case that any of the costings relating the actual network used to deliver the service can be accurately adjusted for an efficient build of the infrastructure required to produce the UCLL service with the most modern technology available. Accordingly, while this approach may appear simpler, the resulting TSLRIC price estimate is normally significantly less precise, and the resulting outcome for economically efficient investment, innovation, and competition is less effective.

²² See for instance the comments made by the European Commission in its recommendation to National Regulatory Authorities in relation to non-core-value-creating assets such as legacy civil engineering infrastructure - *Commission Recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment*; European Commission.

105. The existing UCLL delivery infrastructure is based on a copper network developed from 1881 onwards, and progressively extended, expanded and modernised. From an accounting perspective, a number of extremely complex and subjective judgments would be required in any top-down model to ensure accuracy. These might include:
- a. separating the UCLL service related assets cleanly from Chorus other assets;
 - b. consideration of the historic cost of the network;
 - c. examining the current cost valuation, and the degree of adjustment necessary to meet the modern equivalent asset requirement;
 - d. determining the scope of an efficient build;
 - e. estimating the efficiency adjustments required to deal with operational matters;
 - f. determining the most appropriate allocation keys for a range of shared, joint and common costs, [e.g. cost sharing issues for poles, trenches or ducts utilised by copper and fibre or shared with other utilities]; and
 - g. adjustments for current cost and true economic depreciation.
106. One example of the issues which arise in relation to efficiency adjustments is the fact that State ownership for much of its history focused specific network architecture and deployment decisions on distributional equity (universal service) considerations at various times. Subsequent changes in sub-national population distribution, basic telephone service technologies, the extension of the true economic life of copper networks used to deliver data services, , will have partially but not fully been reflected in the replacement, repairs and maintenance of the pre-existing network.
107. A bottom-up model, ideally a hybrid model calibrated with some top-down information to ensure that it is not divorced from reality requires far fewer qualitative adjustments, relies more on hard quantitative data, and is more likely to reach a more precise estimate of the current cost of delivering the UCLL service using the most modern technology available.
- Optimisation - network modelling considerations*
108. Under the no optimisation approach all nodes are assumed to be where they are in the current network and their functions are unchanged. Similarly, the existing infrastructure between nodes (e.g. ducts and poles) is retained. In addition there is no optimisation to reflect projected demand.
109. This is unsatisfactory as all the inefficiencies that have resulted from incorrect past investment (location and quantity) are included in costs. A hypothetical efficient new entrant would not build such a network.
110. At the other end of the spectrum, complete optimisation, often referred to as scorched earth, assumes that the hypothetical new entrant would start from scratch and completely redesign the network. This would ensure that there are no inefficiencies associated with historical investment. The problem, however, is that it

is difficult to identify the optimal network design. For example, there may be lakes, rivers, mountains, railway lines and so on which need to be taken into account. It is difficult to take account of these in a full scorched earth approach and consequently efficient costs are likely to be understated.

111. Scorched node optimisation is a halfway house between the two extremes described above. The existing number, location and function of nodes are assumed but the nature and capacity of the equipment within the nodes is optimised as is the dimensioning and capacity of the links between these nodes. This approach represents a better balance between reality and efficiency.
112. Modified scorched node refers to a variation of scorched node where the number, location and function of minor nodes (e.g. cross connection points and street cabinets) are optimised, as well as the links between them. This is an acceptable approach provided that unrealistic assumptions about network routing are avoided.²³
113. As noted, we endorse a modified scorched node approach. The TSLRIC model used to derive an UCLL FPP price should model a hypothetical real world network, which an efficient operator would build using current technology, and as appropriate taking advantage of sharing or reusing reusable civil engineering assets as proposed by the European Commission. The Commerce Commission should be wary of modelling approaches which model unrealistic network builds, or which provide windfall revaluation gains.
114. We believe that the use of a bottom-up model validated by reference to selected top-down data from Chorus, together with the choice of a modern equivalent asset and a cautious approach to reusable civil engineering assets provides a reasonable balance between efficiency and real world considerations.

Question 21: If parties develop top-down models independently, how should we audit and reconcile the different models?

115. Telecom strongly suggests that the Commission should build the model itself with appropriate consultation and with full transparency across access provider and access seekers. Given that there is only one access network provider with the scale and scope of Chorus (i.e., Chorus itself), the Commission is the only other party capable of access to network data and operating statistics. Chorus could be expected to develop a competing top-down model based on the huge amount of technical data which it holds and the revenue and funding issues at stake.
116. While it is unclear whether Chorus has or will build a top-down model independently, we believe that the importance of economic efficiency in setting the UCLL FPP price, given its linkage to UBA, and the relationship between UFB pricing and copper pricing should be a key consideration in the Commission's decision-

²³ For example, estimating the length of links between two nodes on a straight line basis would result in an underestimate of efficient costs as cables typically do not follow a crow's flight path from one location to another. Normally they follow the street pattern, and this needs to be taken into account.

making. We urge the Commission to specify to its advisors that it build a bottom-up hybrid model calibrated as appropriate with some top-down data, as a more accurate reflection of the economically efficient UCLL price.

117. While Chorus may well choose to build its own independent model and offer it as a more accurate reflection of the correct TSLRIC approach and the UCLL FPP price, there will still be an obligation on the Commission to consider this model, audit and reconcile it with the “official” model.

118. The experience of the Danish regulator in reconciling top down models developed by the incumbent operator and bottom-up model developed by access seekers provides some assistance for the Commission in the approach to audit and reconciliation of competing models. We also note that this reconciliation exercise provides some important lessons in relation to the specification of the UCLL FPP model. Almost half of the difference between the two models in this instance related to the choice of modern equivalent asset, (noting that in 2003 copper was used by both parties as the basis for the MEA), the selection of WACC, the approach to price trends (i.e. tilted annuity), and the approach to economic depreciation of the asset.

Danish regulator’s experience

119. In relation to the auditing and reconciliation of independently constructed models, we refer the Commission to the experience of the Danish regulator, (at the time known as IT- og Telestyrelsen). As part of the rate setting process for the unbundled local loop in Denmark with effect from 2003, the then current legislation required the incumbent operator to develop a top-down model, while new entrants were required to develop a bottom-up model. The final result was to be achieved by the regulator consolidating and balancing the results of the two models.

120. The process which the regulator employed, in brief, was to identify and quantify the most important sources of difference between the models and test the basis of those differences. We understand that the gap between the results of the top-down and bottom-up models was very large. The access provider’s model, produced a charge for the annual rental for a copper pair of DKK 2,310 while the access seekers’ model produced a charge of DKK 237 – a difference of almost 1000%.

Details of Danish regulator’s process

121. The Danish regulator set out the differences between the two models in its Reconciliation Report²⁴. Key differences in modelling approach between the incumbent and access seekers lay in relation to the structure of the network and

²⁴ Reconciliation Report – differences between the top-down and the bottom-up cost analyses, IT- og Telestyrelsen – 8 May 2002, http://erhvervsstyrelsen.dk/file/233623/reconciliation_report_pdf.pdf

dimensioning rules, data inconsistencies between the two models, and the level of detail in operating indirect and overhead costs.

122. The process employed by the Danish regulator carried out its reconciliation between the models across various layers of the network and reconciled the results for the major assets, e.g. for access the reconciliation process took the bottom-up model as a starting point and examined:

- a. Access, (e.g. access trench and duct access copper, access fibre, distribution points, line cards, other assets and operating costs (looking separately at major categories of cost)
- b. exchanges;
- c. the transport network (including infrastructure); and
- d. co-location.

123. Based on this process, the Danish regulator identified a number of reasons why the results of the two models differed. These included differences in investment costs, (i.e. the modern equivalent asset chosen which is a function of network design, prices, and other factors), differences in annualised costs (affected by depreciation assumptions, price trend and tilted annuity, cost of capital etc.), differences in operating and indirect costs, differences in allocations, and other parameters.

124. For each of those differences, the regulator in its Reconciliation Report took many of the assumptions in the bottom-up model and replaced them with the assumptions used in the top-down model. This allowed the impact of the different assumptions to be quantified. Based on this work and after consultation, the regulator developed a hybrid LRAIC model, in which traffic data is revised annually, while technology assumptions are changed less frequently.

125. We summarise the principal costing differences briefly as follows, and refer the Commission to the Reconciliation Report and related documents for a detailed description of the reconciliation approach:

- a. Differences in gross replacement costs specifically differences in equipment unit costs and equipment requirements arising from differing views on the network factors and equipment required.
 - i. Adjusting the bottom-up model for this factor on the basis of the top-down assumptions and inputs represented 9.8% of the DKK 2073 difference between the two models.
- b. Differences in the annualisation methodology and inputs actually used to annualise the GRCs – we note that the model assumptions on WACC, price trends for the assets, and economic lives of the assets are key elements in the significant difference between the models.
 - i. Adjusting the bottom-up model for this factor on the basis of the top-down assumptions and inputs represented 48.9% of the DKK 2073 difference between the two models.

- c. Differences in the direct or indirect operating costs associated with the assets needed to provide ULL services.
 - i. Adjusting the bottom-up model for this factor on the basis of the top-down assumptions and inputs represented 15.5% of the DKK 2073 difference between the two models.
- d. Differences in the overhead costs associated with the operation of the business as a whole.
 - i. Adjusting the bottom-up model for this factor on the basis of the top-down assumptions and inputs represented 1.8% of the DKK 2073 difference between the two models.
- e. Differences in allocation keys between the different increments and, within each increment between the services that make up the increment in question.
 - i. Adjusting the bottom-up model for this factor on the basis of the top-down assumptions and inputs represented 24.0% of the DKK 2073 difference between the two models.

Question 22: What, in your view, are the important characteristics of Chorus' copper local loop network that must be also available from the MEA? Please outline the reasoning for your view.

126. Telecom considers that the MEA must be able to provide a similar utility and a similar service potential to the copper access network, rather than the same technology characteristics. We note that the Commission considers that copper may be a relevant characteristic for defining the MEA. In TSLRIC modelling of unbundled local loop in the past, it is likely given then current technologies and costs that the functionality of copper networks may well have been such that copper was then an appropriate choice for the MEA. We understand there to be general agreement among network engineers that no hypothetical new network built today would be a copper network.
127. When considering the criteria for selection of an MEA for Chorus' copper network, the Commission should be arguably be taking a forward looking approach to the capability and services which can be delivered over UCLL lines. It should be remembered that the purpose of choosing the MEA is to assess the price which would be required today to recover the capital employed and the cost of that capital in the provision of equivalent services from a substitute asset of comparable utility reflecting best-in-use technology, adjusted for obsolescence (including physical deterioration, functional (technological) obsolescence and economic (external) obsolescence).
128. For this reason, we agree that the Layer 2 input capability, the point to point nature and the unrestricted service capability are features of the UCLL service that are likely to be relevant considerations in selecting the MEA, but are unlikely to be determinative. We do not think that the DC power path, is relevant. We do not have a strong view on the passive vs. active criterion.

Question 23: Do you consider that the criteria we have identified will enable us to make the most appropriate MEA selection?

129. We believe the Commission has identified appropriate criteria to employ in making the selection of an appropriate MEA. It will, as noted above be important in the final selection decision to consider the interdependencies between this and other decisions in respect of model building. We refer again to sections 2 and 3 of the Frontier Economics report.

Question 24: What additional criteria, if any, should we consider for determining the MEA for UCLL?

130. We have not identified other specific criteria we think could be usefully added at this time. We note again our view that the interdependencies between the selection of an MEA, (including any additional selection criteria) and other decisions in respect of model building will be important and should be considered to ensure the most robust estimate cost to enable selection of the UCLL FPP price. We refer again to sections 2 and 3 of the Frontier Economics report.

Question 25: What criteria do you consider to be of most importance in the selection of the MEA for UCLL?

131. We think the paramount question to be considered is how a hypothetical new network builder would choose the type of network it would deploy. The choice of best-in-use technology, and the ability to provide the required services at appropriate quality is important as is the relevant network capacity scope and capability at optimal cost.

132. A further approach to explore is to ascertain the technology roadmap envisaged by equipment vendors, and the current intention from network operators as to what modern technology would be in general use in the medium term. The answer is provided by taking say a 3 or 5 year forward look. Unfortunately the New Zealand and Australian settings are unlikely to provide the optimal answer due to the Government involvements in the UFB programme and the NBN in those countries. As a result, we suggest the Commission should examine what is being deployed and planned for in other countries to gain some guidance.

133. We agree with the Commission's preliminary view set out in paragraph 101.1 and 101.5; whether the asset is "copper" or provides a DC power path would not appear to us to be relevant criteria. In contrast, and as noted earlier, the ability to provide the required services and network capacity is clearly very important. We understand from our network engineers, layer 2 input and point to point capability are likely to be relevant.

Question 26: Are there other MEA options that should also be considered?

134. The potential MEA options that the Commission has identified are consistent with those identified by Telecom, and discussed in the Frontier Economics report: point to point fibre to the home P2P FTTH; G-PON FTTH; fibre to the node (FTTN); and a combination of P2P FTTH and fixed wireless access (FWA). Depending on the circumstances, it is true that these technologies could all be

regarded as MEA networks. This will be an important design choice and consultation matter for the next stage of this process.

Question 27: What are the pros and cons of the options that we have identified and any further options that you may have identified?

135. The attached report from Frontier Economics in sections 3 and 4 identifies two practical options for constructing a TSLRIC model in order to generate a good estimate of the economically efficient FPP price for UCLL. We endorse the suggestion that the Commission should build the model, and that it should be a bottom-up model using a carefully selected MEA and consistent model design, with some top-down validation, and an appropriate level of optimisation to ensure that it reflects both efficient costs and a “real world” link back to the New Zealand network and market. Its object should be to deliver an economically efficient cost for the UCLL service such that it promotes competitive outcomes as described above.
136. As noted elsewhere in our responses to the Commission’s questions, and the Frontier Economics report, the final choices the Commission makes in relation to its choice of MEA and in order to establish a UCLL FPP price most consistent with section 18 are interrelated with its choices around the implementation of a bottom-up or top-down model, the sources of reliable and dependable unit costs for use in the model, the management of optimisation in the model design, and the approach taken to the parameters in the estimation of a CAPM-based WACC.
137. Given the range of choices around selection of an MEA, and the options for model design and construction and the uncertainty as to the approach which the Commission may take to implement the principles it describes in the Issues Paper, Telecom is unable to develop a fuller analysis of the pros and cons of the options identified by the Commission, and the further options suggested in response to Question 27.

Question 28: Should performance adjustments on the MEA value be made to reflect the differing performance attributes of the MEA technology relative to the current UCLL technology?

138. If a combination fibre and fixed wireless access network of a current design, constructed or made using current materials and techniques is treated as the MEA for a copper access network in the manner suggested above, an adjustment will need to be made to estimate the portion of the cost which represents the cost of providing similar function and equivalent utility to the copper network asset adjusted for obsolescence (including physical deterioration, functional (technological) obsolescence and economic (external) obsolescence) and deployed as required to meet the forward looking total service demand for that asset.
139. The Neumann/Vogelsang paper referred to above and by the Commission offers one route for making such adjustments, but it is unclear that sufficient reliable data relevant to New Zealand will be available. Market valuation is likely to also reflect the valuation of the other services which are provided over the access network for instance.

140. Performance adjustments based solely on technical factors represent a questionable basis to make an adjustment since they do not necessarily reflect adequately the features of the service which provide utility to end-users, and which reflect the value they attach to it. As Frontier Economics notes in its report at section 3.4.2 it is not easy to make adjustments to reflect the lower utility of copper

141. We believe that the best option for the Commission in making adjustments for utility would be based on rigorously constructed willingness to pay surveys with sufficient sample size and using conjoint analysis techniques. This is an established and useful technique to provide information on end-users preferences. This is an issue on which we suggest that the Commission seek detailed guidance from expert advisors.

Question 29: What are the potential adjustment options that we should consider? What are the advantages and disadvantages of these options i.e. willingness to pay, technologies and performance, and costs?

142. If an adjustment has to be made, and given that the existing copper network offers lower speeds and performance than the MEA network, it is appropriate that the price of UCLL should be set by taking TSLRIC for access to the MEA network and then adjusting this downwards by some factor to reflect the lower speeds and performance available to copper network users.

143. As a proxy for the market-based data which would be required to implement the Neumann/Vogelsang proposal, we think the Commission could consider an approach which takes account of the factors which end-users may regard as affecting the value differential. We think that the same issues of availability of accurate reliable and relevant data arise for the Commission, but we set out the possibilities for consideration.

144. Despite the difficulties associated with this estimation process, the potential adjustment options involve taking account of either/or (a) differences in willingness to pay for different speeds and performance; (b) differences in technical performance (e.g. relative speed or capacity); or (c) differences in cost.

- a. The key difficulty with the first suggestion is that the New Zealand market generally distinguishes between plans on the basis of data caps rather than different speeds and performance. This parameter can of course be measured by observing, the price differentials that exist between services with different speeds and performance for other countries and seeking to relate it to New Zealand. It relies on the actual revealed preferences of end-users in relation to market decisions, and so is likely to be reliable. Key to its validity is success in establishing a link between end-user preferences in New Zealand and the countries for which data is available. In addition it is technologically and competitively neutral as relative fibre and copper access prices will remain as they are now. It does not, however, reflect relative costs.
- b. The problem with the second suggestion is that relative physical speeds or capacity are not necessarily strongly related to relative willingness to pay.

Moreover, relative physical speeds or capacity do not accurately reflect relative costs. A simplistic adjustment based on relative speeds or capacity (where the ratio is 20 to 1 or even higher) would mean very low prices for UCLL. These would result in below cost UCLL prices and would give rise to an extreme version of the below cost price effects identified in the response to Question 10 above.

- c. As regards (c), relative prices should in principle reflect relative costs. In practice it is not clear how efficient copper network costs would be measured.

145. Of the three options we see as easily available to the Commission, adjustments based on relative willingness to pay are to be preferred on the grounds that they are technologically and competitively neutral and are straightforward to measure and implement. Their limitation, as with the Neumann/Vogelsang approach is in the availability of reliable New Zealand relevant market information.

Question 30: Should a technology's inability to deliver TSO services disqualify it from consideration as an MEA? Or is it more important to have a forward-looking MEA than to preserve the ability to carry legacy services?

146. Telecom does not think that a technology which is unable to deliver the full suite of TSO service should disqualify it from consideration as an MEA. The TSO service suite currently required to be offered is subject to change, and must change, with time and technology. Indeed, the Ministry are considering the list of TSO services with a view to removing certain legacy services in the future.
147. Further and as noted elsewhere, the purpose of choosing an MEA technology is to allow forward-looking efficient access costs to be identified and hence enable appropriate prices for UCLL to be set. The inability of that technology to deliver legacy TSO services such as fax should not matter since these services can in reality still be provided by copper.²⁵ Finally we note that, in our experience, there is every chance that all TSO services will be capable of being supported over all MEAs considered –there are simply higher costs for supporting these services on some access types than on others.

Question 31: What geographical aspects drive equipment/technology choices for network owners?

148. Equipment and technology choices in different areas depend on the comparison of revenues and costs. As the Commission has identified in paragraph 130 in its paper, revenues and costs depend on population density, line length (which is typically closely related to population density), topography, geological factors and local government regulations (e.g. relating to rights of way or, in the case of FWA, to the siting of radio masts).

²⁵ The inability of the MEA technology to deliver legacy TSO services does mean that the scale and scope of the hypothetical new entrant differs from that of Chorus. However, that difference is small given that fax and low speed data services represent a very small part of the traffic carried.

149. As noted in our response to Question 17 the issue of population density has two aspects – density of population clusters, for which urbanisation is a proxy, and density of population overall. Urbanised New Zealand population occupies about 2.7% of the useable land area, some 7% of the population occupy rural areas with some urban influence, and amounting to some 14% of the land area, while the remaining 7% occupy more remote rural areas.
150. New Zealand’s urban settlements are relatively low density due presumably to the availability of land. Urban population density ranges from approximately 250 to 580 people per square kilometre. This pattern of distribution will affect modelling choices and selection of the MEA. Arguably FWA is more likely to be the MEA for many non-urban end-users rather than fixed access networks largely built prior to the privatisation of Telecom.
151. We note also that the Commission has analysed relevant cost drivers for UCLL in some detail in the 2007 and 2012 UCLL IPP benchmarking processes, and that WIK-Consult has provided a report “UCLL cost drivers and comparability criteria” summarising its views and experience in connection with the 2012 UCLL IPP benchmarking process.

Question 32: What forecasts of demand currently exist that may be relevant?

152. Demand, in the UCLL FPP model should in the first instance be based on all current end-users. At this stage we have not considered in detail what longer term demand forecasts are available which might be consistent with any potential regulatory period. Additional sources of information may be Statistics NZ projections on population growth and regional growth together with urbanisation, household and household access information from Census data, estimates of the fibre adoption curve compiled by market analysts such as IDC and other similar information.

Question 33: How would we establish an accurate forecast of the network provider’s connection volumes over time?

153. At this stage we suggest that sources of relevant information would include summaries of past trends in the growth of the total market for connections compiled by market analysts such as IDC or Ovum, (e.g. for Chorus, other LFCs, and including mobile only) together with the market share of Chorus, plus forecasts from the different entities, again as compiled by market analysts.
154. We also suggest that this data might conceivably enable the Commission to build an econometric model of the relationship between the number of connections and the variables that determine it and then forecast the number of connections by forecasting changes in the driver variables.

Question 34: Do you agree that the TSO area is an appropriate area to consider when calculating the cost of UCLL? If not, what would you consider to be a better alternative?

155. The TSLRIC model from which the UCLL price is derived should cover all areas where there is currently a copper access network

Question 35: Is there benefit in segmenting common costs in this way i.e. as it allows for different allocation methodologies to be applied to different cost pools?

156. Telecommunications is typically characterised by a large pool of sunk and irreversible costs. A challenge for regulators in cost modelling is to allocate accurately a large pool of common costs relating to the diverse products supplied under regulation. The problem becomes more acute where the regulated firm supplies regulated and unregulated products, some of the latter of which have market prices conditioned by the regulated services, and some of which do not. The accuracy of the allocation methodology becomes a key element in the costs which are modelled for the regulated service.
157. We consider that there is merit in segmenting common costs between shared costs, network costs, and non-network cost, while testing for accuracy and materiality both on an individual and cumulative level. The allocation of common costs generally can represent a significant proportion of the costs to be recovered from an FPP price. Given that any estimates of common cost will be point estimates with some uncertainty, Telecom considers that there is value in segmenting the classes of common costs and testing the outcome as described.
158. In paragraph 142 of the Issues Paper, the Commission state that equi-proportional mark-up is the methodology commonly adopted in relation to LRIC cost modelling. Telecom note that there is indeed regulatory practice which acts as a precedent for its use particularly in relation to mobile services. The Commission should be aware that this technique has limitations in practice and should only be adopted in appropriate circumstances. These limitations are also established in regulatory practice.
159. To summarise briefly²⁶, EPMU may well be appropriate in circumstances where there are only small differences in demand elasticities between the relevant products for which common costs are being allocated. In this case there may well be economic inefficiencies in the allocation, but they are likely to be small. In a situation where the demand elasticities are not similar and the difference is more material, efficiency distortions become more significant. Where common costs are allocated across both the regulated portfolio of products and the unregulated portfolio of products, the likely disparity in demand elasticities makes the use of EPMU questionable.
160. There are a range of alternatives to allocation of common costs which do not suffer from the efficiency distorting limitations of EPMU. While EPMU may be suitable in the circumstance described above, we recommend that the Commission consider the use of a range of options including the three types of cost drivers outlined in paragraph 141 where there is doubt as to the scale of difference in demand elasticities, where there is a clear difference, or, in the absence of evidence

²⁶ Ofcom considered this issue in the context of its 2004 review of wholesale mobile voice call termination.

to the contrary, where there is a mix of regulated and unregulated products across which common costs must be allocated.

161. For example, in sections 3 and 4 of the Frontier Economics paper, reference is made on a number of occasions to the approach which should be taken in relation to assets common to both copper and fibre access networks. We endorse the approach suggested in paragraph 3.5.2 *Assets common to CGA and NGA* as an approach preferable to the use of EPMU. This approach is a practical approach to allocation which avoids the risk of unexpected price fluctuations as the utilisation of copper assets reduces over time.

162. A crucial consideration in building an FPP model is the source for all modelled cost information. We note that the Issues Paper does not touch on this matter in detail. The accuracy of costs is a vital element in building a TSLRIC model. A second important element is the choice of allocation key used to apportion those costs.

Question 36: Is the distinction between shared and common costs necessary? Does the allocation methodology need to differ between shared and common costs?

163. As noted above, we think there is merit in making a distinction between shared and common costs. By definition, shared costs are not common to all activities undertaken by the firm. Accordingly, these costs should ideally be allocated using an appropriate allocation key and mark-up methodology which realistically reflects the strength of their influence on the costs of the service to which they contribute. In the selection of the allocation key, the materiality of the cost, and the cumulative materiality of associated costs in the cost stack should be taken into account.

164. In contrast, common costs are common to all activities and should be allocated via a mark-up across all activities. It is appropriate to distinguish them from shared costs, and further, to select an allocation key for the mark-up applied to each activity which realistically allocates the mark-up to the cost stack for the service

165. In the case of common fixed costs it is not possible to allocate them using input cost drivers (as recognised in paragraph 144 of the Commission's paper). This is because they are incurred irrespective of output and the number of services.

Question 37: Should we use an alternative depreciation approach to tilted annuity and if so, why is this preferable?

166. Telecom is of the view that in general, economic depreciation would be preferred to the tilted annuity approach in telecommunications cost models. Economic depreciation is, in effect, the depreciation that a network operator would be expected to recognise in a workably competitive telecommunications market. This approach takes account of expected revenue, operating costs and asset prices and how they change over time, (inflationary and deflationary costs).

167. However, as the Commission notes, there is a high information requirement involved and, where there are long-lived assets, forecasts of revenue, operating

costs and asset prices are required over a long period of time. This makes economic depreciation approaches difficult.

168. In these circumstances, we agree that a tilted annuity approach may well provide an acceptable proxy for economic depreciation if all relevant factors are fully considered. At a high level, at least four crucial factors need to be taken into account when selecting and implementing a depreciation approach under a TSLRIC model; the current cost of the MEA, the forecast MEA cost, the output of the modelled network over the duration of the regulatory period, the best estimate of the economic lifetime of the MEA²⁷. These factors are as important for the use of tilted annuities as they are for economic depreciation approaches. The Frontier Economics report discusses the approach to depreciation in section 4.3 and also suggests a tilted annuity approach as preferable.

169. The choice of depreciation methodology, together with the approach to cost of capital represent a significant component of the cost attributed to a service given the high sunk and common cost levels typical of telecommunication network operators. The materiality of this component means that irrespective of the method chosen, it is important that it reflect depreciation as accurately as possible.

Question 38: If we adopt a tilted annuity approach, what factors reflect how the tilt should be set?

170. A tilted annuity will give a reasonable approximation to economic depreciation provided that the tilt factor not only takes account of expected asset price changes but also reflects any expected changes in the volume of output per asset. This means that for assets whose volume does not vary in line with output (e.g. duct and exchange buildings) there should be an additional tilt in addition to the one that takes account of asset price changes. This is because the costs of such assets do not change in line with output and revenues and hence the ability to finance depreciation changes over time.²⁸

171. A tilted annuity can take account of changes in output per asset by incorporating this additional tilt. The other depreciation methods described by the Commission cannot do that. Reflecting this, we disagree with the Commission's conclusion in paragraph 165 that expected changes in demand do not provide a reason for selecting one depreciation method over another.

Question 39: Do you agree that it is appropriate to use the cost of capital input methodologies as the starting point for estimating the cost of capital for the UCLL TSLRIC model?

172. We agree that the cost of capital inputs methodologies ("IMs") provide the logical starting point for the Commission if a WACC/CAPM based estimate is being made.

²⁷ In some circumstances the best estimate of the financial lifetime of the MEA may be a sound proxy for the economic lifetime when other factors are taken into account.

²⁸ For example, where output is increasing relative to asset volumes, revenues will be growing relative to costs and hence the ability to finance depreciation of the assets concerned is increasing over time. This in turn implies an upward sloping depreciation schedule (i.e. a positive tilt).

173. As the Commission is aware, we have provided a number of submissions in the past, including in connection with the consultation process and workshop on the Cost of Capital Guidelines, and the Input Methodologies processes. We refer the Commission to those submissions. The Commission's consultation process for the cost of capital input methodologies was an extensive and thorough process, which canvassed a wide range of issues relevant to setting the cost of capital. Because of this, it is likely to be a useful starting point for setting the cost of capital for the UCLL FPP.

174. To summarise our previous submissions briefly we continue to suggest to the Commission that that methodologies outside the WACC/CAPM approach to cost of capital estimations should always be under consideration. There are a number of reasons for this view which are fully set out in our earlier submissions, (e.g. that the rate of technological change in telecommunications is much greater than in the industries currently covered by cost of capital IMs and therefore the Commission should remain open to other approaches). Similarly, we suggest that the Commission itself should keep reviewing other available methodologies since the Input Methodologies approach itself may require revision over time as better cost of capital tools are developed.

Question 40: If the cost of capital input methodologies are used as the starting point, which (if any) parameters should be updated to reflect the specific circumstances of the UCLL TSLRIC model?

175. On the basis that the Commission will use its Input Methodologies framework as a starting point, we presume that its process will be as follows:

- a. make initial estimates, which then remain fixed, for UCLL leverage, asset beta and the term of the risk free rate and debt;
- b. retest its existing estimate for the tax adjusted market risk premium for continued relevance, check tax parameters and review any UCLL specific estimates for debt issuance costs;
- c. make specific estimates, using the IMs approach, of the risk free rate relevant to the regulatory period and of the debt premium with such estimates revised whenever the UCLL costs are reassessed.

176. In our view, the Commission should at least consider whether every parameter in the cost of capital calculation needs to be updated. Some parameters may only need to be updated to reflect changes in the time period being considered e.g., the risk-free rate.

177. We consider that other parameters will need to be updated to reflect the specific features of the telecommunications industry, and in particular of the UCLL service and closely related regulated services, together with commercial services whose prices may be conditioned by the UCLL service. Particular attention should be given to the equity beta, the debt premium, and leverage, as these can often materially vary for different industries and firms, and for different businesses contained within those firms.

Question 41: Do you agree that it is appropriate to use the simplified Brennan-Lally capital asset pricing model as the basis for estimating the cost of equity for the UCLL service?

178. We refer the Commission again to our earlier submissions on related matters. We agree that the use of the CAPM approach is appropriate in relation to the UCLL service. While the Brennan-Lally model is not without controversy, for practical reasons, we agree that the widespread use of the Brennan-Lally model in the New Zealand market, and the Commission's use of it across regulated firms in New Zealand mean that it is a reasonable basis for use in calculating the cost of capital for the UCLL service.

179. While it may or may not be relevant to the final approach in the UCLL service, we remain of the view that the Brennan-Lally CPM appears to exacerbate the problem of the CAPM underestimating the cost of capital for low beta firms.

Question 42: Which comparator firms should be used to estimate the beta for the UCLL service?

180. The cost of capital is being applied to the case of the operator of a hypothetical new network that has the scale and scope of Chorus. The level of difference between Chorus and the modelled hypothetical network operator are such that Chorus will not represent a suitable comparator firm. In searching for comparable comparator firms, we are seeking comparator companies that only provide fixed telecom network infrastructure services and accordingly occupy a similar place in the telecommunications supply chain. There are very few direct potential listed comparators available.

181. At this time, Telecom has not yet been able to identify sufficiently comparable specific comparator firms that it considers would be appropriate to use in estimating the beta for the UCLL service. We look forward to being able to provide further submissions to the Commission on this as the UCLL FPP modelling process commences.

Potential approaches to estimating beta for consideration

182. In the absence of specific recommendations, we recommend a range of possibilities to the Commission for consideration. The possible approach should include an analysis of asset betas (that is to say, deleveraged equity betas) for:
- a. Chorus, subject to a careful examination of the range of issues surrounding its share price behaviour following listing and during the more recent period of volatility;
 - b. Direct comparators to Chorus that are listed overseas, although we are presently unable to identify any sufficiently comparable candidates, and imagine that this approach is unlikely to yield a very big sample;
 - c. Decomposition analysis of the betas of integrated telecommunications operators that are listed overseas, and including companies that are 'pure plays' operating in the non-UCLL sectors of integrated telecommunications providers;

- d. Any NZ listed companies in other industries that might still be considered somewhat comparable (although we are presently unable to identify any sufficiently comparable candidates); and in the absence of any better information,
- e. Decomposition of the cost of capital decisions of other regulators to determine their approach to beta.

183. In our view, the approach taken to beta in the TSO process is unlikely to offer material assistance in determining an appropriate beta for the UCLL service.

Choice of MEA impacts beta estimate

184. A significant issue we draw to the Commission's attention is likely to be the impact on beta (i.e. the systematic risk facing an investor) of the final choices in the modelling approach taken by the Commission. As noted elsewhere the UCLL FPP modelling approach requires a range of choices and assumptions such as the choice of MEA, scorched node assumptions, optimisation, performance adjustments and depreciation. These will all have an influence on the beta selection decision.

185. In particular, we note that the specific treatment of asset related risks, such as the risk of technological obsolescence, over recurring UCLL costing cycles will influence the initial beta settings, and the approach taken on resets.

Q43: Which approaches to estimating operating expenditure are most appropriate in the UCLL TSLRIC modelling exercise?

186. Top-down approaches to estimating operating expenditure have the problem that they use the network operator's actual costs and these are likely to be higher than efficient costs.

187. Bottom-up approaches are inherently difficult to implement. Deriving each and every type of cost on a bottom up basis is likely to be very time consuming. Also it is difficult not to miss costs out. Consequently bottom up estimates tend to underestimate costs and are very difficult to implement.

188. A standard way of estimating operating expenditure in TSLRIC models is to ask operators (not just Chorus) for their estimates of the ratio of operating costs to purchase costs for different types of equipment. They can also be asked for their estimate of the ratio of different type of overhead to direct costs.