



Analytical framework for considering an uplift to FPP prices

Submission | Commerce Commission

11 May 2015

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Executive Summary

1. The Commission's draft FPP determination for UCLL proposes a significant increase in UCLL prices, to a level that is 60% higher than the price in next highest comparable country, and 80% higher than the median price in comparable countries.
2. There is no evidence this material divergence from international benchmarks can be explained by any New Zealand-specific factors. Rather, the evidence suggests it is the result simply of overly conservative and incorrect Commission modelling choices.
3. In this context, it is difficult to see how any case could be made for further "uplifts" to the draft UCLL price in order to boost the price even further above any other country.
4. The Commission's proposed framework, unadjusted, supports this assessment: it supports an uplift to prices and/or WACC only when the most extreme, unrealistic, assumptions are used. When adjusted, it shows there cannot be benefit to end-users from any uplift in any reasonable scenario.

Proposed framework for considering an uplift to regulated prices

5. The two adjustments to regulated prices considered by the Commission are to:
 - a. First, apply an uplift to the TSLRIC price for the UCLL service to promote the migration to fibre. This seeks to evaluate the potential welfare consequences of increasing the UCLL price above the central estimate produced by its cost model. In the example set out in the conference paper, this would be to promote the migration to fibre based services; and
 - b. Second, apply an uplift to the mid-point WACC estimate for UCLL and UBA services to promote investment incentives. The Commission seeks to trade off the cost to consumers of a WACC uplift against potential benefits associated with reducing the risk of under-investment in telecommunications services.
6. In respect of the adjustment to the TSLRIC price – the costs modelled by the Commission exceed the modelled benefits in almost every scenario. The modelled benefits significantly over-estimate the externalities associated with a faster migration to fibre services because they are, in practice, not specific to FTTH services in any sense (and cannot therefore be claimed to represent externality benefits from a faster migration to fibre) and the modelled costs significantly under-estimate the costs of an uplift, because they exclude the costs associated with lower take-up and usage of broadband generally.
7. In respect of the second adjustment – the adjustment to the WACC – the case for an adjustment is incredibly difficult to make because (a) there is next to no Chorus investment occurring in the regulated services that could be impacted by regulatory price settings; and (b) the key investments driving innovation in respect of retail broadband are being undertaken by RSPs and/or over the top application providers, which investments would be *reduced* rather than increased, by such an uplift to the WACC.
8. Finally, we note that, as this price review determination (**PRD**) simply tasks the Commission with setting a TSLRIC price for the regulated service. The Commission does not have the power to apply a separate uplift to promote transition to fibre, or to promote investment in fibre. Were the Commission to do so it would likely be acting outside the scope of its powers and accordingly acting unlawfully.

9. For the sake of discourse on the subject only, in circumstances where it may be lawful for the Commission to consider an uplift to regulated pricing, such an enquiry should be focussed and limited as follows:
 - a. An uplift should only be considered if the proper application of the relevant pricing principle indicates a likelihood of inefficient under-recovery of costs for the Access Provider;
 - b. The extent of the uplift should be limited to the evidenced amount required to off-set any such under-recovery;
 - c. No uplift can provide the access seeker with a windfall or other premium that is not justified by the actual or likely direct investment required to continue to provide the regulated service in the long term;
 - d. An uplift in the regulated service should not be used to further an ancillary policy objective, that Parliament has not expressly authorised;
 - e. A proper application of section 18 requires that the Commission recognise and give weight to the allocative and productive efficiencies generated by a lower price and only give weight to countervailing dynamic efficiencies that would arise in the provision of the regulated service directly as a result of the proposed uplift and only to the extent that such dynamic efficiencies will demonstrably produce a greater long term benefit for end users;
 - f. The relevant end-users are the end users of the regulated service. The competitive or contracted forces relevant to unregulated services resolve the interests of end users of unregulated services – the Commission has no role to play in those.

The CEG model

10. WIK and NWS also review the CEG model and proposed parameters – highlighting the significant limitations of the approach. The Commission considered the Dobbs model in the IMs and all experts, including Professor Dobbs, advised against using the model to quantify any adjustment.
11. NWS note that, even if the model could be relied on, CEG has not applied it correctly. The model is based on incremental costs and benefits, yet CEF adopt parameters that are clearly not incremental to investment in performance improvement.
12. There is no reliable data or evidence considered to date and accordingly any results would be speculative.

Introduction

1. Thank you for the opportunity to comment on the proposed analytical approach for considering an uplift to the TSLRIC price and/or WACC (the **conference paper**), and CEGs 20 March 2015 paper proposing a methodology for quantifying an uplift to the WACC estimate (**CEG paper**).
2. The Commission sets out proposed frameworks for considering the consumer welfare effects relating to a possible uplift to the UCCL price in order to promote the migration to fibre based services, and an uplift to the UCLL and UBA regulated WACC services to promote new investment in innovation.
3. The Commission has engaged Oxera to undertake an analysis to provide a basis for parties to consider whether a WACC uplift should be applied for UCLL and UBA, including reviewing the suitability of the framework developed in the context of the input methodologies under part 4 of the Commerce Act 1189 (**IMs**). While the Commission intends to publish Oxera's findings in advance of the further draft decision, the analysis is not yet available to the parties or consumer groups
4. The Commission has already proposed prices that are significantly outside the range of prices seen in countries we compare ourselves to, and an uplift would take us further outside that range. There is no evidence of any New-Zealand specific factors that would explain this significant divergence from international benchmarks.
5. The proposed prices will have significant implications for end users, and create a substantial drain on business and reduce New Zealand's international competitiveness. The fact that the Commission's model produces prices so out of alignment with those seen elsewhere should set alarm bells ringing. The Commission should be considering a process to understand the results and validating or amend its model, whereas we are now considering proposes that would further increase the price of regulated services.
6. In terms of a WACC uplift alone, if the Commission were to adopt the 75th percentile WACC estimate as proposed by Chorus, this would result in UCLL prices of over \$30 per month. Or put another way, it would add over \$2 per month more to the proposed UCLL prices and create a further \$220 million wealth transfer to Chorus over the 5 year regulatory period.¹ A general uplift to UCLL prices would boost prices even further.
7. Leaving aside the question of whether the Commission can, in fact, consider uplifts, any uplift must be based on quantifiable empirical evidence, it must be evidence based and rationally connected to the specific purpose of the regulatory decision under consideration. In other words, the static and allocative efficiencies which we know will be achieved through lower cost-oriented pricing would need to be outweighed by clear evidence of more substantial dynamic efficiencies that will arise on the regulated service if the price was increased above the equilibrium level. This is not a speculative analysis: prior to applying an uplift the Commission would need to have clear evidence of a tangible and rational connection to demonstrate that an uplift would indeed better promote section 18 in respect for the long term benefit of the ultimate end-users of UCLL and UBA based services.
8. Based on what we have seen the Commission does not have evidence to support an uplift and we do not see how it could obtain such evidence in this process. But more importantly the Commission should not be looking for evidence on whether a fibre transition will be facilitated by an uplift as it is out of scope of this process. All the evidence is that the draft price is very generous and ensures the recovery of efficient costs.

¹ High level estimate based on increment from move to 75th percentile, and current UCLL demand over 5 years (ignoring growth and discount rate).

9. Attached are expert reports by WIK-Consult (**WIK**) and Network Strategies (**NWS**) addressing issues raised by the conference and CEG papers.

Framework for considering an uplift to the TSLRIC price for the UCLL service

10. The conference paper sought views from the parties on the proposed framework for considering an uplift to the UCLL TSLRIC price and/or the UCLL and UBA WACC.

72.1 Do you agree with the proposed framework for assessing the potential welfare effects of any uplift in the TSLRIC price?

11. No, we do not support the proposed framework.
12. As noted below, and detailed further in the expert reports from WIK-Consult and Network Strategies, the proposed framework takes only a partial view of the impacts, and uses a range of inputs which are unlikely to be relevant to and sufficiently reliable in the New Zealand setting. In Spark's view, supported by advice from our experts, it is unlikely that extending the proposed framework to consider the full range of impacts on welfare outcomes will produce sufficiently reliable results to provide support for an uplift in the TSLRIC UCLL price.
13. The proposed approach seeks to quantify the consumer welfare implications of higher UCLL prices and accelerated migration from copper-based to fibre-based services. This is the sort of analysis that, from a wider policy setting perspective, should be undertaken by policymakers to support policy initiatives (although, as set out below, we have significant concerns with the adequacy and direction of some of the Commission's proposed parameters).
14. Even then, policy makers would need to extend the partial and high-level welfare analysis set out in the conference paper prior to making policy decisions. For example, a fuller picture would reflect the impact of the copper-based price on maximising access to broadband consumption for all end-users across both platforms, encouraging both incremental access to copper-based services and migration to fibre-based services.
15. However, the Commission isn't tasked with determining wider policy, it is tasked with implementing the pricing framework set out in the Act. As WIK advises, it is not aware of any regulator applying such an uplift to a TSLRIC based price and the proposal would create a number of distortions for the UCLL and UBA prices, and for investment and uptake of fibre services. Professor Vogelsang has advised the Commission not to err towards overestimating the TSLRIC price, in large part since he concludes :

By using a classical TSLRIC approach with no quality adjustment for the UFB MEA, from an actual cost perspective the TSLRIC method currently proposed by the NZCC is likely to be substantially more than needed by Chorus for covering the cost of its copper access network. Thus, the copper access network is likely to remain highly profitable. This bodes well for Chorus' decisions regarding copper upgrades and copper investments in maintenance in those areas, where Chorus is not the UFB provider.²

² Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand, Vogelsang, November 25, 2014, at paragraph 118

No power to apply a migration uplift to the UCLL price

16. The Commission is required to complete a specific task in this PRD – to set the price for two regulated services using TSLRIC. That task does not require or permit it to also introduce a second objective of promoting migration to fibre. Migration to fibre is excluded from the scope of the price setting requirements for UCLL and UBA which is extensive enough on its own and cost-based.
17. At the UCLL and UBA conference the Commission appeared to explore new approaches to, and interpretations of, section 18 which we considered to be distracting and unhelpful at this stage. Section 18 does not provide a broad brush discretion for policy implementation - it is subservient to and not inconsistent with the pricing principle of the designated access service. Section 18, although broadly worded does not provide broad discretion to the Commission to consider the relativities between regulated and unregulated services in markets more generally. Nor does it provide for a hierarchy of needs between investors in access providers and access seekers. A proper interpretation of section 18 requires the Commission to be more focussed. In this and any other PRD for that matter, it must:
 - a. Set a price based on efficient costs (arrived at using TSLRIC in this case),
 - b. Which will best promote competition,
 - c. In markets that rely on that regulated service (UCLL or UBA as the case may be) as an input,
 - d. For the long term benefit of end-users,
 - e. Of telecommunications services that use that regulated service as an input.
18. The only policy that the Commission is permitted to implement in this PRD is to set UCLL and UBA prices at efficient cost. From that starting point, efficient competition is promoted and all other efficiencies flow - efficient investment, efficient innovation, merit-based competition between services, competitive retail markets and long term benefits for end users. Accordingly section 18 is best given effect to when the TSLRIC price is properly calculated and the best estimate of an equilibrium price can be identified.
19. The only possible section 18 uplift available to the Commission in this case would be an uplift to avoid inefficient under-recovery of cost. Meaning that if the modelled TSLRIC price was at a level that was evidently below efficient cost, then a section 18 uplift may be permissible to adjust the modelled price to better approximate efficient cost. But the available evidence shows that the Commission's modelled TSLRIC price is substantially higher than that identified in any other comparable country by at least 60%. There is apparently no evidence that efficient costs in New Zealand are by such orders of magnitude greater than those identified in comparative countries against which we compete on a global scale. The Commission's experts have advised it that its modelled TSLRIC price provides a generous recovery of costs to Chorus. Without evidence of under-recovery, any uplift would be unjustified and unlawful.
20. The Commission is not required or empowered to promote migration to fibre in this PRD. The necessarily broad nature of the purpose statement does not provide the Commission with a broad discretion across every regulatory decision it makes. To the contrary, it arguably serves to narrow and focus the scope of the Commission's discretion as we have previously submitted - to achieving competitive outcomes, not to picking winners or to determining investment returns. The common law provides that each decision the Commission makes must be rationally connected to its purpose and the purpose of this PRD is to set competitive copper prices for UBA and UCLL. A decision to provide an uplift to the regulated copper prices to make these services appear less

competitive, to promote migration away from these services to another service (whether it be fibre, 4G mobile or another service) is not rationally connected to the purpose of setting a cost-based price for UCLL and UBA.

21. Another reflection would be that placing undue weight on promoting fibre migration would be to give weight to irrelevant considerations in this PRD. The Commission would presumably not consider it relevant to provide an uplift to copper prices to promote the relative benefits arising from fixed to mobile substitution, or the relative benefits of other regulated services.

An uplift is no solution

22. Even if the Commission considered migration to fibre to be a desirable outcome for end users of telecommunications services in New Zealand generally, it still would not follow that an uplift to the copper price to promote migration is the right thing to do. An uplift to the copper price will increase the risk of prices above efficient cost, but may have little or no effect on fibre migration (as the data seems to indicate), it may incentivise inefficient by-pass investment, or it may simply transfer wealth to Chorus with no resultant gain in net efficiency.
23. The Commission's cost modelling suggests UFB prices sit significantly above long-run cost. In that sense, the argument for an "uplift" to copper prices effectively suggests that the most efficient means of facilitating an accelerated copper-fibre migration is to raise copper prices above cost in order to dampen their competitive effects on above-cost fibre prices. If we assume that an accelerated migration is necessary and efficient (for the record we do not accept this) then it must surely be more efficient to reduce fibre prices downwards, closer to their long-run cost in order to achieve this.
24. In 2011 if it had so chosen, Government could have required or empowered the Commission to develop, consider or approve a broad fibre migration plan (as it did in Australia) but it expressly refrained from doing so. A fibre migration plan is no insubstantial task. Time and resources required to produce a meaningful fibre migration plan would alone lead one to the conclusion that such a task would be entirely separate from a PRD for copper services, and would be expressly provided for and resourced by the legislature. Fibre is rightly dealt with on its own - it's own contracted obligations, subsidies, price caps and incentives. In the circumstances, placing a disproportionate weight on considerations relating to fibre (which the Commission appears to be doing here) is most likely outside the purpose of this PRD, irrelevant to the determination of whether the price set delivers efficient competitive outcomes and benefits to end users of the regulated service, and outside the scope of the Commission's powers.

A properly constructed TSLRIC model will provide all the TSLRIC benefits

25. The TSLRIC methodology at the heart of the FPP is best understood as a mechanism for estimating the competitive price which Chorus, in this case, as the Access Provider would charge its wholesale customers if it did not have a substantial degree of market power in the wholesale supply of UCLL and UBA services. This would also be the price which would allow it to compete effectively using UCLL and UBA in the LFC areas where it is not the UFB provider.
26. As set out in our previous submission, an efficient price that provides for the service and a normal return over long term is equivalent to that which would be expected to come out of a competitive market. The Commission is setting a UCLL and UBA price and needs to focus on setting an efficient price for that service. This is what the Act requires, i.e. setting of efficient prices because other wider effects are considered elsewhere (by policy makers that have a range of policy instruments available to them). Therefore, it is not up to the Commission to try and set relativities between copper and fibre for migration benefits - it is tasked with setting efficient prices that leave end users to make this choice based on relative costs.

27. Where the Commission and its advisors have developed and validated a comprehensive TSLRIC cost model for the regulated services, provided parties with full data to enable scrutiny, engaged in a sound consultative process, and properly considered all relevant submissions, the resulting adjustments should result in a properly constructed model which provides a sound estimate of the current competitive market price based on a detailed analysis of economic cost.
28. Such a price provides Chorus with efficient signals for its own investment decisions and decisions on product and service innovation, with a regulated return on and of the capital employed which recovers efficient investment, and provides certainty for its investors. Spark, other RSPs, and other LFC's also are able to make investment decisions and stimulate innovation in products and services based on the Commission's best estimate of the regulated price.
29. Therefore, where the TSLRIC price itself is providing the expected benefits for end users, the TSLRIC exercise the Commission must only ask itself – is what data or assumptions provide me with the best estimate of efficient costs for the regulated service I am pricing here? There is no scope in TSLRIC for considering migration benefits or dynamic efficiency considerations of fibre.

There is no nexus between an uplift and the claimed benefits

30. The network externalities and marginal benefit of fibre based service performance improvement are all more efficiently reflected and addressed through fibre pricing. These are determined by LFCs and the Crown. To back solve the relativities through adjusting the UCLL price (rather than setting an efficient UCLL price and letting fibre providers establish the relativities) can only be inefficient. We think it would be more efficient to price these benefits in to the fibre price. For example, Chorus and the Crown are fully able to reflect/capture relative marginal costs (for performance improvement investment) and network effects in setting the fibre price. In fact, it is more efficient to do this than seek to do so through an inefficient copper price.
31. Any departure from the signals provided to all market participants by the TSLRIC prices will influence the capital budgeting and business models of both upstream and downstream market participants – Chorus and LFCs on the one hand, and RSPs and other market participants on the other. Instead of promoting efficient investment by access seekers, an uplift could promote inefficient investment to by-pass rents now built into the regulated service price. Any uplift can only be justified on the basis of compelling evidence demonstrating a case outside the margin of error to avoid the risk of adverse market outcomes and where this represents the most cost-effective means of remedying TSLRIC model error. In short, any unjustifiable departure from efficient pricing signals will result in suboptimal investment decisions in the market.

72.2 If not, what alternative approaches should be used, and why should that alternative be preferred?

32. We do not believe that there is any external justification for an uplift to the TSLRIC price. The Commission's task is limited to setting the efficient prices for the regulated UCLL, (and UBA) service(s). It is conceivable, that the Commission's FPP model, might hypothetically, for reasons other than errors in the core estimate of regulatory WACC, produce a TSLRIC price which materially resulted in the same kind of asymmetric risk as might be produced by a WACC estimation error.
33. If so, were there compelling quantitative evidence in support, the Commission has two possible choices; the first might be to return to the model to isolate the source of model or parameter error, make appropriate adjustments, and rerun the model to produce a TSLRIC price which does not create a material level of asymmetric risk. The second, might be to make an adjustment to the TSLRIC price to reduce the asymmetric risk to Chorus. Given Professor Vogelsang's 25 November conclusions on the draft TSLRIC prices, as noted in our response to question 72.1

above, and our and our expert advisors' assessments of the current draft TSLRIC prices, in terms of the UCLL service, we think at the moment there is no justification for any such adjustment.

72.3 In terms of the above framework, are you aware of any empirical evidence which is relevant for quantifying any externality effect attributable to an uplift to the TSLRIC price?

34. Spark is unaware of any reliable empirical evidence other than the 2014 Briglauer study referenced by Professor Cambini.³ We caution that even this estimate should be regarded with caution if it were to be applied in the New Zealand setting.
35. Ultimately, at this stage in the development of the market, there is no evidence that UCLL prices have any material impact on the uptake of fibre over all the other factors at play. There is no problem with the uptake of fibre – in fact the opposite is true (there are insufficient supply-side resources to cope with existing demand).
36. Further, there is no evidence of network externalities or suggestion that fibre providers are unable to reflect network externalities in fibre pricing. The services from which network externalities may arise are not yet known. In this sense, we question many, if not all, of the externalities benefits the Commission's analysis "values". There simply isn't any evidence yet of fibre-specific externalities. In fact the opposite is true – any externalities that might be claimed for fast broadband are, today, capable of being provided over the existing copper/FTTN network.
37. In Australia, the Independent Cost-Benefit Analysis of the NBN (the "**Vertigan Report**") undertook a detailed assessment of the benefits of fibre to the premises, including an analysis and forecast of domestic bandwidth requirements in Australia for the period 2013-2023. The conclusions are stark: the median household in 2023 will have a peak bandwidth demand of 15Mbps. Further, when "low externality" applications such as TV and bittorrent traffic, the median peak bandwidth drops to 11Mbps. The traffic types, and the median bandwidth requirements, are capable of being met by copper/FTTN-based services. Yes, there will be a proportion of users that require bandwidths that can only be provided by fibre, but they will be a small percentage of users, and these bandwidth demands will be driven by applications with private benefits, not externalities with public benefits.
38. This does not mean that FTTH is not the appropriate MEA: it is clearly the technology a network operator would choose to deploy today, and it is similarly clear that end-users do see sufficient private benefits in fibre to prefer FTTH-based services to FTTN/copper-based ones. But it does mean that there are at best very little in the way of identifiable externalities associated with FTTH services today. Certainly not of the value suggested by the Commission's modelling.
39. In contrast, we note that the Commission's analysis of the costs associated with an "uplift" to the TSLRIC price excludes the costs associated with:
 - a. Lower penetration/uptake of broadband as a result of higher entry level prices; and
 - b. Lower usage of broadband as a result of higher prices at each data cap level.
40. Spark considered these issues in an earlier submission and concluded that, even on a cursory and conservative analysis, these effects could be expected to result in social costs that alone swamp the posited benefits in the Commission's modelling.

³ *The Impact of Regulation and Competition on the Adoption of Fibre-Based Broadband Services: Recent Evidence from the European Union Member States*, Briglauer as cited in *Economics aspects of migration to fibre and potential welfare gains and losses from an uplift to Copper Prices*, Advice to the Commerce Commission, Cambini, 16 March 2015, at page 10.

41. This leaves the Commission in the position of considering an adjustment when it has and cannot have any evidence that there is a problem or impact, beyond the material and known adverse impact of higher prices for end users.
46. Under these circumstances, even if the Commission had a mandate to make such an uplift, it is not required to do so and shouldn't at this stage. The Commission is able to wait, and should impacts becomes apparent, it could then undertake a section 30R review and consider what uplift was appropriate when there was more evidence.

72.4 Do you have any comments on the other parameters and/or assumptions made in the above framework?

42. Spark asked Network Strategies and WIK-Consult to examine these in detail. We agree with their analysis and conclusions as to the parameters and assumptions set out in their attached expert reports. A key assumption underlying the proposed framework, is that it considers the welfare effects in sufficient detail. We think this assumption is wrong.
43. Both advisors note that the Commission's framework does not take account of the full range of parameters and impacts which would be required to inform the Commission properly that an uplift to the TSLRIC price for UCLL was justifiable on welfare grounds, (setting aside the question whether this is within the scope of the Act). Secondly, as Network Strategies and WIK both point out a number of the input assumptions to the proposed framework are not robust, and cannot be clearly supported in the New Zealand environment. We refer the Commission to the detailed discussion contained in each advisor's expert report.
44. Ultimately, at this stage in the development of the market, there is no evidence that UCLL prices in the New Zealand setting, will have any material impact on the uptake of fibre over all the other factors at play during the regulatory period. Further, there is still no evidence of network externalities or suggestion that fibre providers are unable to reflect network externalities in fibre pricing in New Zealand. The full range of services from which network externalities may well arise are either not yet available, or not yet widely deployed, end-user adoption is still limited, and their effect is not yet clearly known. This leaves the Commission in the position of considering an adjustment when it has and cannot yet have any clear evidence that there is a problem or impact, beyond the material and known impact of higher prices for end users.
45. Under these circumstances, even if the Commission had a mandate to make such an uplift, it is not required to do so and given the uncertainties shouldn't at this stage. The Commission is able to wait until compelling evidence is available, and if it does have the mandate to do so, when the likelihood of material welfare impacts becomes apparent, it could then undertake a section 30R review and consider what uplift was appropriate when there was more evidence.

The proposed fibre migration uplift raises similar difficulties to proposed backdating

46. The proposal to apply an uplift to promote the migration to fibre raises similar Section 18 and efficiency considerations as those considered by the Commission in its emerging view on backdating as it was discussed at the UCLL and UBA conference.
47. Another type of uplift considered under section 18 is the possibility of backdating a higher regulated price to an earlier date. There are two problems with this:
 - a. Backdating in this case does not serve to promote efficient competitive outcomes; and

- b. Backdating appears to be under consideration due to a misapplication of the Court of Appeal decision in the Telecom case.⁴

48. In other words, both proposals rely on departing from the efficient price to achieve wider objectives that sit outside a properly established TSLRIC price.

Efficient outcomes and backdating

49. It is common cause that the Commission has discretion to set the commencement date and duration of this PRD. But there still seems to be some concern that it could be regarded as inefficient if the price set under this determination were not given retrospective effect from either 1 December 2014 or even 1 December 2012, the dates on which the UBA and UCLL prices came into effect under their respective IPP determinations.

50. We consider the evidence to be overwhelmingly that efficiencies in a PRD for a standard terms determination (**STD**) are inherently more likely to be advanced when the price is set on a forward-looking basis – that is, from the date of the final determination for a duration to be determined by the Commission. In that way, parties are able to operate with certainty as to the price, revenues and costs incurred up until the date of the final determination, and thence forth, with certainty on the price, costs and revenues they will incur in respect of the regulated service sold or consumed going forward.

51. Spark recognises that the possibility of backdating has already generated inefficiencies, with some RSPs seeking to mitigate the impact of possible backdating with anticipatory price rises. And it is precisely because we recognise that these price rises are inefficient that we have committed to returning our additional charges to our customers in a fair and transparent way if backdating does not occur. We consider that such a move would generate competitive responses that will ultimately flow through to end-users and benefit them in the long term.

52. At the UCLL/UBA conference we mentioned that the only evidence of backdating in comparative jurisdictions takes place where backdating is used to guard against the incentive on parties to delay a determination for self-serving reasons – generally those akin to negotiate-arbitrate processes, or those more aligned to the bi-lateral determination process under section 27 of the Act where backdating is required to ensure the efficacy and robustness of the regime. In price setting determinations such as this PRD, which apply to the industry as a whole and in respect of which the timeframes are substantially controlled by the Commerce Commission, there is no evidence of any efficiency in favour of backdating that outweighs the inefficiencies generated by backdating.⁵

53. Furthermore, we consider that it was wrong for Chorus to suggest that its shareholders have had to endure an “inefficient” price since 2012. In the first instance, we note that, as a result of the UBA retail-minus price freeze, Chorus has in totality received in excess of an efficient forward-looking cost-based return on its network during this period. If there has not been efficient recovery of costs during this period, it is because there has been over-recovery, not under-recovery.

54. That fact aside, we also note that the lawfully set IPP prices for UCLL and UBA are set in accordance with the Act and are set consistent with section 18 and section 19. In respect of the UBA IPP price the Court of Appeal expressly stated that to be the case. On the other hand the draft FPP price is only an initial estimate of an efficient price, it is not a final price (nor even an

⁴ Telecom New Zealand Limited v The Commerce Commission and Telstraclear Limited CA 75/05 [25 May 2006]

⁵ See the ACCCs guide to backdating in regulatory decision-making at <https://www.accc.gov.au/publications/guidelines-relating-to-deferral-of-arbitrations-and-backdating-of-determinations>

interim price). It provides little reliable data (and no certainty) for parties to base investment decisions on. And basing corporate decision on a draft price carries substantial risk and does generate avoidable inefficiency. That is entirely different to basing corporate decisions on a final price determined in accordance with the IPP. An IPP price is final, it is lawfully determined and it must be regarded as a decision that gives best effect to section 18. Accordingly there is no need to backdate the FPP price to somehow re-adjust the efficient signals provided to the market by the regulated price.

55. A final point on backdating is that at the conference it appeared that Chorus misunderstood the context and accordingly the nature of the Telecom decision. Despite Commissioner Welson drawing to Chorus' attention the specific statutory framework and context within which the Telecom case was decided it appears that Chorus had overlooked or at best sought to trivialise the fundamental consideration of efficacy which occupied the High Court and Court of Appeal's mind in that case. In Telecom, and for bilateral determinations generally, as a matter of efficacy, the Court of Appeal found that the FPP price needed to be given retrospective effect to the commencement date of the IPP determination due to the limited and relatively short duration of the regulatory period for section 27 determinations. If such a purposive approach were not taken, there would have been a very real possibility that a PRD could be delayed by a party for so long that it could only be concluded after the end of the relevant regulatory period and accordingly never prevail as a price in the market.⁶ In the Telecom case, the FPP price would not have prevailed at all in two of the three determinations under review and would only have prevailed for a period of some months before the determination would have lapsed in the third. In those circumstances best effect could not be given to section 18 if the more efficient price only prevailed for a short portion of the regulatory period or (as would have been the case in respect of two of the decisions under review) was never to become operative.
56. In this case no such concerns arise. The price determined under the FPP will be in place for 5 years from the effective date. It is within the Commission's powers to set the duration of the regulatory period for this price to apply without concerns over efficacy as standard terms determinations under section 30 themselves have no expiry date, nor does the IPP price. And once the FPP price is finally determined, it is up to the Commission to set the duration for which that that efficient price will apply. Backdating would create considerable hardship for parties impacted by it, compromise business plans and efficient infrastructure and services level investment by RSPs.
57. It would be fair to say that of all the arcane aspects of these regulatory process, backdating is the most difficult to justify to our business leaders. They tell us that the possibility of backdating a price for a service some 12 to 36 months after that service was consumed is hard to get one's head around because the price we paid for that service was lawfully determined and agreed, we accepted the services on the basis of a standard terms agreement which does not itself provide for backdating, and where no party has committed any commercial or legal wrong there is no precedent in commerce for such punitive action to be taken. Even if we suggest to them that the basis for backdating seems to derive from a Court of Appeal decision they tell us that it just does not make common or commercial sense. And when they put it that way, it seems to us that in this case backdating is not what Harrison J in the High court would have expected.⁷

⁶ See paragraphs 19, 21 and in particular lines 4-6 of paragraph 44 of *Telecom* case which states "*The alternative view implies a potential for negating the efficacy of the review process which the Act has established in order to serve the section 18 purpose.*"

⁷ See paragraph 25 of *Telecom* case, "*Harrison J considered that the Act's silence on recovery mechanisms may reflect a legislative presumption that common and commercial sense would prevail.*"

Framework for considering an uplift to the mid-point WACC estimate for UCLL and UBA

58. The Commission also proposes to consider whether a WACC uplift is necessary to address the risk of investment in innovative new technologies being delayed or not occurring.
59. The conference paper sets out a possible framework for considering the extent of any uplift. The proposed framework seeks to trade off the costs to consumers of higher prices against the potential benefits of reducing the risk that investment in innovative new services might be delayed or may not occur if the allowed WACC is under-estimated.
60. The Commission has considered an uplift to the WACC in the context of Part 4 regulation to address a very specific issue – the risk that truncated returns through regulatory price setting would result in under-investment in network reliability. Even in the IM process all experts advised caution in applying an uplift, and that should only be considered where other mechanisms were not available to mitigate the risk of under-investment, where under-investment becomes apparent could not be addressed in future periods, and where there was evidence that an uplift would result in the proposed investment.
61. Following the IMs approach, the conference paper notes that the primary questions are:
 - a. Whether there is any reason to depart from the mid-point WACC estimate?
 - b. If so, what is the most appropriate percentile? The conference paper sets out a possible approach for considering the extent of any uplift.
62. We agree, the Commission should first establish whether there is any reason to depart from the mid-point WACC estimate. A clear, evidence-based, and principled approach to the question of asymmetric regulatory risk in relation to setting WACC is crucial both for the FPP processes and as a signal to market participants. Ensuring that both Chorus as the Access Provider, and RSPs as Access Seekers facing competition, can make an appropriate return on efficient investment such that they can attract new funding from capital markets can only be in the long term best interests of end users.
63. Other issues which have been raised during the consultation process seek to add other risk considerations to the asymmetric risk arising from regulation. Generally these matters are more relevant to the methodology employed to develop the core estimate of WACC rather than the risks associated with price cap regulation. Spark has addressed these matters in earlier submissions and advisor expert reports and we do not repeat those here.
64. It is inappropriate to make any uplift to the core estimate of WACC in the absence of clear and compelling supporting evidence.

Whether there is any reason to depart from the mid-point estimate?

65. A WACC uplift has been applied in limited circumstances to address asymmetric risk due to an incorrect estimate of WACC arises in two situations:
 - a. First the core estimate of WACC may be less (or more) than the actual value of WACC, and
 - b. Second, there may be risk of variability of WACC over the course of the regulatory period.

66. The Commission, in the IMs has endorsed the first principle as requiring consideration in regulatory decision-making, and ruled out the second.⁸
67. It is appropriate to consider whether there is evidence of a material level of asymmetric risk due to the price cap incentive scheme of regulation set out in the Telecommunications Act. As set out below, the TSLRIC model and telecommunications market circumstances suggests there is no evidence to support departing from the mid-point WACC estimate.
68. The Commission's use of the simplified Brennan-Lally CAPM approach, largely endorsed by the Courts, results in a predictable approach to estimating a forward looking WACC for the regulated services and provides investor certainty of the nature of returns for both the debt and equity funders of the business across the regulatory period.
69. The asymmetric risk resulting from an overly low estimate of WACC should be considered where there is clear evidence that this is likely to result in a material truncation of asset returns. National regulators commonly consider that an estimate of WACC which is materially lower than the actual WACC creates the risk of reducing incentives for investment and innovation, ("the reverse Averch-Johnson effect"), and hence reducing dynamic efficiency while favouring allocative and productive efficiency considerations. Equally, an overly high estimate of WACC will over-reward the Access Provider and not necessarily translate to productive investment, ("the Averch-Johnson effect") while also reducing dynamic efficiency and impacting adversely on static efficiencies. Both outcomes carry a welfare cost which regulators seek to minimise.
70. Regulatory practice is to recognise the trade-off on the assumption that where there is justification, dynamic efficiency may be maximised by a measured increase in the central estimate of WACC which will reduce the probability and quantum of truncated returns resulting from the asymmetric risk, without imposing an excessive welfare cost.
71. The Commission should very carefully consider that the probability of actual future investment in the regulated services, (beyond the demand driven upgrades, and required repairs and maintenance needed to maintain the regulated services), is low, given Chorus' contractual arrangements with Crown Fibre Holdings. Importantly, as Professor Vogelsang points out, the FPP model already provides a regulated cost for the provision of services based on the MEA without performance adjustments to equate it with the regulated services. Spark considers that the risk of reducing incentives for investment and innovation based on the core estimate of WACC is likely to be small.

Asymmetric risk through truncated returns does not apply more generally

72. The conference paper notes at paragraph 82 that the decision regarding whether to apply an uplift to the UCLL and UBA WACC could potentially send an important signal to investors in telecommunications services more generally. The Commission notes that other factors may limit the significance of any signalling effect, including the relative importance of other new service investment drivers and likelihood of the service being regulated.
73. The Commission appears concerned with the precedential impact of its WACC uplift decision for investments and innovation for investors outside the regulated services. The framework paper does not make completely clear the exact scope of these concerns. In other words, whether the conference paper is suggesting that wider signals are provided by applying an uplift to the UCLL and UBA WACC or whether it is by consideration of an uplift appropriate for the circumstances at the time.

⁸ Dobbs relates to this.

74. In terms of the wider regulatory signals, we agree that the Commission should consider whether a WACC adjustment is required given the circumstances of the regulatory cost model and regulated service for which an efficient price is being set. However, if the Commission is indicating that it will adjust the UCLL and UBA WACC for a different (unregulated) services circumstances, then this would be wrong. There is no general rationale for uplifting WACC for a regulated service to provide incentives for investments unconnected with that service.
75. The Commission is obliged to set an efficient price for the regulated service and, as set out above, this could include consideration of truncated returns. However, the efficient price is specific to that service as it is influenced by the prevailing circumstances and environment. Under these circumstances, the only wider signal that the Commission can provide is that it will ensure a clear and transparent consultation process with affected parties. In other words, the Commission can't set an efficient price for the regulated service and expect that the same conclusion can be drawn for another service, i.e. a decision can't be efficient for both. Therefore, the only consistent thing the Commission can do is take a principled and measured approach. This process would be followed by decision-making which took account of the interests of all investors whether supplying or consuming regulated services, in accord with the section 18 objectives.
76. Further, the Commission's proposed approach is not consistent with the IM analysis. In making an adjustment to the WACC in the IM context, the Commission is adjusting for the possibility of truncated returns and this means that it is setting the expected WACC for the investment. In other words, by adjusting for the truncation, the WACC is not higher or lower than that necessary to provide a normal return on investments. The analysis then considers the implications for end users of higher prices against the possibility that returns are truncated and that, in practice, this results in under-investment.
77. The conference paper framework, however, potentially takes a range of other considerations into account. These depart from the rationale used in the IM analysis and in almost every case would result in a WACC estimate that provides a return which would be higher than a normal return (because it is not only addressing the potential impact of possible truncated returns). In other words, the Commission would be at risk of setting a WACC higher than the optimal WACC. As WIK discusses in sections 3.3 and 3.4 of their expert report, this will raise important questions as to whose and which additional investments will be incentivised, and who should bear the costs of that.
78. It is axiomatic in the TSLRIC methodology that only users of the regulated service should pay for production of that service and not other users. The corollary is that users of other regulated and unregulated services should not be cross-subsidised by users of the regulated service. The IM analysis uplift does not support an uplift for the mid-point WACC in a TSLRIC model other than to avoid the possibility of truncated returns.

Considering the consumer welfare trade off

79. A WACC uplift will have material implications for end users faced with higher prices.
80. In determining whether an uplift is required the Commission should consider whether returns are likely to be truncated and the possible nexus with investment in quality and innovations. The factors that would be considered include:

The probability distribution of forward looking returns

81. In considering this trade-off it is important to remember that this application of this trade-off in practice relies on the validity of the assumption as to the shape of the probability distribution of forward looking returns. It is well known that the CAPM model relies, as a simplifying assumption, on the normal distribution when considering the variability of asset returns. The practical

application for regulators of adjustments to WACC to address the concerns of asymmetric risk requires consideration of reality. Asset returns, and associated risk measures are not necessarily normally distributed, and estimates of WACC are also not necessarily normally distributed around a mid-point estimate. This cannot be ignored when considering if, when and how to make an adjustment to a central estimate of WACC.

82. The CAPM model has acknowledged shortcomings, but as applied in the simplified Brennan-Lally approach used by the Commission, remains in common use as the best available tool for making a central estimate of WACC. The High Court has endorsed its use in the regulatory setting.
83. As noted in our cross-submission on the draft Determination there is evidence that the actual probability distribution of asset returns is likely to be based on a power law function with a long tail to the right implying a higher probability of positive outcomes.⁹ Assuming this to be correct suggests that the exposure to asymmetric risk of lower than expected asset returns is small. In fact this is consistent with the regulatory goal of price cap incentive regulation - simply to limit the scope for greater than expected asset returns.

That TSLRIC prices exceed Chorus actual costs and there is unlikely to be truncated returns

84. The TSLRIC methodology at the heart of the FPP is best understood as a mechanism for estimating the efficient price which Chorus, in this case, as the Access Provider would charge its wholesale customers if it did not have an effective monopoly or substantial degree of market power in the wholesale supply of UCLL and UBA services. This would also be the price which would allow it to compete effectively using UCLL and UBA in the LFC areas where it is not the UFB provider.
85. Accordingly the issue of asymmetric risk arises, not in assessing the outcomes for the HEO in the TSLRIC model, but in the application of the modelled FPP price to Chorus as the Access Provider.
86. In the setting of a TSLRIC FPP process, the forward looking long-run incremental cost model uses a modern equivalent asset in place of the existing technology where, as is the case with copper, the existing technology is redundant on a forward looking basis. In this situation, the appropriate optimised replacement cost of the modern equivalent asset should ideally be based on the capacity actually used to replace the existing service, and if the existing asset itself incorporates excess capacity or other inefficiencies due to path dependencies or over-investment, a measured approach to optimisation means that the replacement cost should be based on the capacity actually required to supply the existing service. Professor Vogelsang notes for example that a large portion of the copper-related costs are sunk and that there are likely to be a range of overcapacities as a result. In his view this suggests that the true forward looking costs would likely be lower than the TSLRIC estimate using the traditional application used in the past by regulators.
87. As Professor Vogelsang points out, in the present case, the choices implemented in the model such as the treatment of investment subsidies and not adjusting the MEA for the performance differences, provide a generous outcome for Chorus. His view is that it would be highly unlikely that any uplift would be required as a result. Given that evidence has been provided to the Commission that current prices are unlikely to be below efficient cost, and that the draft prices are also unlikely to be below efficient cost, we think it unlikely that Chorus will be able to demonstrate to the Commission and stakeholders that there is a material probability-adjusted exposure to asymmetric risk.

⁹ Spark cross submission on draft determination 20 March 2015, para 229

There is low risk of an underinvestment problem in UCLL, UBA or successor services

88. There is a stronger justification for an uplift to WACC where there is a material risk of network failure due to underinvestment. A TSLRIC model provides a cost estimate of the efficient cost to provide the regulated services based on projected demand on a total service long run basis, and should, accordingly provide the regulated firm with a level of compensation which minimises the risk of network failure due to underinvestment, particularly in the presence of substantial sunk depreciated costs, potential overcapacity, recognition of subsidies, and no adjustment to the MEA for a higher level of performance capability.
89. For the same reason, we think it unlikely that there is any reasonable basis to uplift the WACC to avoid the regulated firm deferring crucial investment in the regulated service due to inadequate revenues. Equally, the risk of an underinvestment problem arising is small, and so the risk that any shortfall cannot be mitigated in subsequent periods is also small.
90. In any case, minimal Chorus investment could be influenced by the regulated prices. Chorus has committed to deploy the fibre and RBI networks. Further, of Chorus' investment in the copper network, little investment is likely determined by regulated wholesale prices. Of the \$51M Chorus reports it invested in the copper network in 2014:
- a. Around \$35M relates to maintaining the copper network. Chorus notes that this investment is made where it is deemed more cost effective to replace the network than reactive maintenance.¹⁰ In other words, the investment is cost minimising rather than related to service revenues;
 - b. Around \$15M was invested in copper connections. As set out in our previous submissions, Chorus' current connection rules sees end users and developers charged the full costs of connecting customers. While actual charges for the installation of the lead-in have varied over time, the customer has generally provided the open trench and a contribution to Chorus' costs.¹¹ Therefore, while categorised as investment, this is likely funded predominantly through upfront charges to end users;
 - c. The residual \$1M was invested in copper product development. This was down from \$7M the previous year due to limited development of copper related products.
91. By comparison Chorus earned \$543 million dollars for copper broadband in the same period. With earnings 10 times greater than investment the overwhelming picture is that there is little to no chance of inefficient under-recovery arising from either the IPP or draft FPP prices.
92. Further, Chorus is working with RSPs to transition the management of customers seeking to connect to the network to RSPs and implement new fault management practices. Chorus has indicated that in all areas (UFB and otherwise):
- a. New connecting customers to the copper network will be charged the full cost to connect to the network including any necessary capacity augmentation. For example, the list of customer chargeable work includes outside boundary trenching, laying of duct, installation of manhole, hauling of cable, jointing, cut-in at the Pillar/terminal, regrouping and overlay sections of D or E side cable;

¹⁰ See Chorus management commentary. <https://www.chorus.co.nz/file/52452/3.-Management-commentary.pdf>

¹¹ For example, TLOC as at April 1999 provides for an upfront site visit charge, and additional poles, trenching and labour costs to be charged to the customer. Telecom would provide materials such as the cable and ETP. More recent Chorus tactics see the customer also being charged upfront for materials.

- b. New connecting customers will be charged the cost to fix faulty pairs where fixing existing faulty pairs is necessary to create capacity for new connections. Under this model, there is a clear incentive on Chorus to restore customer service by using spare pairs rather than fix the underlying network fault. Chorus is then able to charge new customer to fix faulty pairs where subsequently required for capacity reasons. With these tactics, we will likely see the copper network coverage contract over time as the network asset expires; and
 - c. Customers will be charged the cost to fix faulty pairs where it is uneconomic for Chorus to repair the cable. It is unclear what the criteria is for customer charges to repair faulty pairs and are seeking advice from Chorus on this.
93. Chorus invested around \$10M in network equipment for broadband capacity and growth over the same period. This investment is for capacity rather than innovation or quality of service that is the concern of the uplift framework.
94. Overall, it is clear that Chorus is minimising any investment in the copper network, and these investment tactics are consistent with a migration to fibre and commercially agreed UFB and RBI arrangements. Chorus is not obliged to connect new customers and has indicated it will seek to migrate customers to other platforms when new copper investment is required. This is rational commercial behaviour that the Commission should expect to see irrespective of the determined price.

Any under-investment can be remedied in future periods

95. As noted earlier, the Commission could consider an adjustment to the WACC where there is evidence of a possible asymmetry that puts investment at risk and, should under investment occur in practice, cannot be mitigated in subsequent periods. The proposed uplift approach is a blunt policy instrument that is not well targeted at possible concerns.
96. However, in this case, the Commission is able to adjust the model through section 30R review should concerns become apparent. Accordingly, the Commission is able to address possible under-investment concerns should they occur in practice.

91.1 Whether [the proposed] framework is suitable for considering the extent of any uplift to be applied to the mid-point WACC estimate for UCLL and UBA?

97. We think that the approach developed by Oxera for the electricity lines businesses represents a more robust approach to the estimate of a WACC uplift to the Frontier-Dobbs model, and particularly the variant of the Frontier-Dobbs model suggested by CEG. As set out in detail in this submission, the only justification within the classic TSLRIC methodology for applying an uplift to the core estimate of regulatory WACC should be based on an analysis which shows a material level of asymmetric risk arising from an error in estimation. Spark believes this is more consistent with the finding of the Courts in the Merits Review decision.
98. Although paragraph 88 of the Commission's 2 April 2015 agenda and topics document notes that this is the principal focus of the framework as proposed, we think a better framework would rest on sound quantitative evidence provided by Chorus to show that there is a material probability that the asymmetric risk associated with price cap incentive regulation truncates not merely excess returns, but results in a sub-normal return. We refer again to Professor Vogelsang's observation cited more fully in the response to Question 72.1. He concludes that Chorus is likely to receive substantially more than needed for covering the cost of its copper access network. This implies that Chorus' highly profitable copper access network is unlikely to necessarily experience adverse impacts for copper upgrades maintenance. This is consistent with all evidence that Spark has been able to consider, and accordingly we continue to consider that the extension of the proposed framework suggested by the Commission in paragraph 88 should not be considered.

99. WIK-Consult in section 3 of their expert report have set out a more detailed framework which Spark thinks provides a more complete basis on which to minimise the risk of under-investment due to the mis-estimation of the WACC. They raise key concerns as to how the final incidence either of these risks or the uplift to WACC used should be borne through the supply chain to end-users in both the short and the long run. WIK also make the point that they have grave doubts that the relevant data is available to support the case for an uplift, and that any estimate from a comprehensive model would also be uncertain.
100. We do not think that there is justification to adjust the core estimate of WACC in consideration of fibre migration for the same reasons set out above in our responses to questions 72.1-72.4. The key consideration under TSLRIC, as for our responses to those questions is that the Commission should set an efficient price for the regulated services. The best available estimate of this will minimise adverse impacts of increased costs to consumers through the efficient pricing signals provided by and to Chorus as the Access Provider, and to RSPs and others as Access Seekers. Any adjustment to the best available estimate of this price risks unintended consequences to Chorus, RSPs, the incentives for investment and innovation by both, and for uptake and consumption of services by end-users.

91.2 Appropriate values for key parameters?

101. Subject to our comments above as to the limitations of the proposed framework, we agree with the conclusions drawn by Network Strategies in section 3 of their report, that it will be difficult for the Commission to identify sound evidence to support the benefit-cost ratio associated with investments, the combined probabilities, and the margin below the optimal WACC which would be required to defer or not make the relevant investment. We also agree that information from the electricity sector will not be reliable evidence for the telecommunications industry. We are unable to suggest appropriate values for key parameters at this time. Even if we were, we conclude, based on WIK's advice to us, that the Commission's framework approach should be extended to address the concerns they raise. As they note, it will be difficult to obtain robust data to support even a more complete analysis.
102. We do not believe that there is compelling evidence which has yet been put before the Commission to show that any adjustment to the core estimate of regulatory WACC is justified. In the absence of any quantitative evidence that, on examination, supports the need for an adjustment, there is no reason for the Commission to consider that the mid-point estimate is materially incorrect.

Monte Carlo Simulation – pros and cons

103. In paragraphs 93-101 of the Commission's framework document, stakeholder views were asked for in relation to the practicality and merits of using a Monte Carlo simulation analysis to generate a range of TSLRIC prices from which an appropriate price point might be chosen.
104. CEG's submission on the Draft Determination pointed to a range of TSLRIC model parameters which it considered to have a material effect on the modelled cost, and the possible impact of uncertainty surrounding point estimates for those parameters on that cost. Chief among these parameters was the WACC estimate, but they also noted the relevance of unit costs, asset lives and the related price trends, and the estimate and forecasts of demand.
105. We note that Network Strategies provided comments on CEG's submission in their expert report accompanying the cross-submissions from Spark and Vodafone. We have also asked Network Strategies to comment again on these matters in their expert report accompanying this submission.

106. Spark believes Network Strategies' key criticisms of the CEG proposal from both these reports are valid. First, we agree that a well-structured simulation model of this type, if carefully applied can be used to derive an interval estimate which can be said with a certain level of confidence to contain the true parameter value, or a point estimate within such an interval which approximates the true value.
107. The Commission has considered the complexities of the use of Monte Carlo techniques in relation regulatory decision making in the past¹². At paragraph 7.25 of the *Gas Control Inquiry, Final Report, Public Version, 29 November 2004*, the Commission reported its views on the use of Monte Carlo analysis after considering a simulation model provided by CRA on behalf of NGC, and commissioning an expert report from Meyrick and Associates to assist its deliberations. The Commission set out a number of specific conclusions it reached from this consideration. We think these specific concerns are substantially very relevant to the CEG proposal.
108. The Commission has also considered the use of Monte Carlo techniques in connection with the estimation of WACC in the 19 June 2009 *Revised Draft Guidelines on the Cost of Capital Paper*¹³. At paragraph 238 of that paper, the Commission expressed the view that it is feasible to obtain direct estimates and reasonable ranges for WACC without Monte Carlo techniques, and that employing Monte Carlo methods would add unnecessary complexity to the estimation process. The extensive discussion of this issue on Day 2 of the Cost of Capital Workshop canvasses both the advantages and the complexities of Monte Carlo techniques.¹⁴ In relation to the estimate of WACC for the UCLL and UBA FPP, Spark continues to believe that the current estimates of WACC are reasonable. We think that the use of Monte Carlo analysis in the FPP processes for UCLL and UBA at this stage would add unnecessary complications to the process.
109. For the reasons set out below, we think that the range, complexity and detailed considerations required to develop a well-structured simulation model from the current cost model, together with the specific expertise required is likely create time, cost, and information requirements which will outweigh the value of any analysis:
- a. The Commission observes that the use of simulation approaches is informationally very demanding. As Network Strategies also points out, there are a number of decisions required in implementing a simulation using Monte Carlo sampling or any of the other developments in simulation techniques developed since the middle of last century;
 - b. As the Commission recognises in paragraph 99 of its framework document, a key element in the application of a simulation model of this type is to develop a view of the uncertainty associated with various inputs. Spark's experience in using statistical modelling packages to carry out simulation analyses of this type confirms that the validity of the output of a simulation analysis is heavily dependent on the appropriate choice and use of probability distributions to accurately simulate the uncertainty and variability of key parameters. As the Commission suggests, to hypothesise an accurate probability distribution from an overly small sample is risky in the extreme. The default assumption that variability will be normally distributed in the absence of other evidence is not robust and will lead to unreliable results;
 - c. Established techniques for simulation models used in developing statistical inferences commonly use not only Monte Carlo sampling but other related techniques such as Latin

¹² All relevant documents may be found at <http://www.comcom.govt.nz/regulated-industries/gas-pipelines/gas-archive/2003-gas-pipeline-inquiry/> (accessed 8 May 2015). The final report can be found under the tab *Commission Documents*.

¹³ <http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/cost-of-capital/http://www.comcom.govt.nz/dmsdocument/5957>

¹⁴ *Cost of Capital Workshop Day 2 Transcript*, 13 November 2009 at pages 212-224. <http://www.comcom.govt.nz/dmsdocument/5939>

Hypercube (or other stratified sampling techniques), Markov Chain Monte Carlo algorithms such as Gibbs sampling. Each has specific advantages and disadvantages, and the selection of the appropriate technique should be matched to the facts and circumstances. This is a matter for expert advice;

- d. In addition, if the simulation is to provide useful results the underlying cost model must have been carefully constructed to reflect the causal links and the interdependences between variables.

110. Spark does not believe that it would be appropriate for the Commission to consider using a Monte Carlo analysis in the context of the FPP at this stage, despite the potential merits of the technique.

111. If Monte Carlo or other sampling techniques were to be used by the Commission in future, the requirement for a cost model to support simulation modelling should form part of the original model specification and be fully consulted on with stakeholders. Spark does not believe that a Monte Carlo analysis will add significant value to the Commission's decision making in the current FPP processes for UCLL and UBA.

The CEG application of Dobbs

112. Chorus submitted the CEG paper *Welfare effects of UCLL and UBA uplift* (March 2015) as an adjunct to Chorus' cross-submission and associated expert reports submitted on 24 March 2015. In this paper, CEG has tried to estimate the welfare effects of uncertainty in the core estimate of WACC for UCLL and UBA associated with incentives to invest.

113. The CEG paper reports the results of adapting the model developed by Frontier Economics for Transpower to the WACC estimates for UCLL and UBA. The Frontier Economics model seeks to refine and implements the framework developed by Dobbs in his 2011 paper.

114. We have asked Network Strategies to comment in detail on the CEG model. They discuss in detail the Frontier-Dobbs model prepared for Transpower, the Commission's response to it in its consultation on the IM's WACC percentile review, Professor Dobbs rejection of it as a tool for estimating an uplift to WACC, and the Commission's reasons for rejecting the Dobbs framework, and the Frontier Dobbs model in its draft decision on the cost of capital for the UBA and UCLL pricing reviews.

The Commission's reception of the Frontier-Dobbs model

115. In relation to the IM's process, and after taking advice from Professor Dobbs and other experts, the Commission decided that the Frontier-Dobbs model did not address the key issue of concern – namely the potential for uncertainty in the regulatory WACC estimate. In addition, it did not focus on the underinvestment issue in relation to the existing network, and was likely to significantly overstate the relative influence of the WACC uplift.

116. CEG respond to this criticism by suggesting that the Dobbs approach captures both uncertainty in the core estimate of WACC, and the volatility risk associated with the core estimate being fixed for the entire period. We think that the WACC regulation process in relation to TSLRIC might be better seen as operating as a feedback process which dampens WACC volatility during the regulated period.

117. In brief, the Commission sets price caps using a TSLRIC model to determine the cost of the regulated asset base (and by extension the imputed interest, depreciation and so on), and influencing expected asset returns for the regulatory period, which in turn influence the value of the regulated asset and significantly affect the risk and risk adjusted cost of capital. This is the

reason that the Commission's estimate of WACC is regarded by internal and external parties as a significant risk driver for Chorus in relation at least to the regulated UCLL and UBA services. As noted above, the predictability and transparency of regulatory processes become important in relation to price review at the end of the regulatory period

118. Spark thinks that the Dobbs framework as applied in the Frontier-Dobbs and CEG model does not take explicit account of the effect of error in estimating the regulatory WACC, and that the Commission is right to consider it inappropriate in the current process.
119. The Commission was concerned that the model was highly sensitive to the accuracy of estimation for the input parameters. In particular, the high degree of model sensitivity to the assumptions for demand elasticity and willingness to pay suggests that these should be specified with a high degree of accuracy in order to derive valid and realistic estimates.
120. Similarly, a range of key assumptions must be satisfied for the model to deliver valid results. In particular, two assumptions are that there is zero cross-elasticity across the services, and that demand grows exponentially for a firm which serves final retail demand. The model results are also strongly influenced by the choice of welfare standard selected.
121. The Commission's preliminary view in its draft decision on the cost of capital for the UBA and UCLL pricing reviews is to reject the Frontier-Dobbs approach as inappropriate. We agree with the conclusion reached by the Commission in relation to these services.
122. The Dobbs framework appears primarily intended to develop a risk-minimising estimate of the appropriate rate of return WACC within a CPI-X regulatory schema on a given schema of existing investments, non-deferrable investments, and deferrable investments, in regulated services. This approach does not of itself address the asymmetric risk of error in estimation of the regulatory WACC discussed in detail above.

The CEG implementation of the Frontier-Dobbs model is flawed

123. The CEG implementation of the Frontier-Dobbs model has been examined in detail by Network Strategies. They find that CEG has made a range of changes to the model code, and adjusted parameters of the model.
124. We have a range of serious concerns as to the assumptions which underlie the CEG model results.

Uplifts incorrectly applied at the same rate to both sunk and new copper investment

125. Dobbs notes that in relation to the existing investment category, on a total welfare standard, total welfare is maximised at a rate of return below the central estimate of regulatory WACC. On a short run consumer welfare standard the model would suggest that consumer surplus would be maximised on a nil rate of return for existing investment, while in the long run, consumer surplus would likely be maximised at a rate of return less than the central estimate of regulatory WACC.
126. As Network Strategies points out, CEG apply the same uplift to sunk and new investments at their view of the optimal cost of capital percentile – 99% - with the effect of collapsing sunk investment and new investment including non-regulated fibre-based network deployment. Spark thinks it is clear that the Dobbs framework cannot be applied to fibre investment in New Zealand, but any uplift must be limited to and differentiated between sunk and new investment in the UCLL and UBA services.

CEG model incorrectly includes unregulated UFB services

127. CEG's assumptions in relation to the demand for new services suffers from the same conceptual error. Whether non-deferrable or deferrable, UFB related investment cannot be subsumed to the category of new investment in the Dobbs framework. As noted above, and as discussed in the report from Network Strategies, the quantum of new investment in the UCLL and UBA services, not otherwise recovered from other parties, and which Chorus is undertaking is very limited indeed and only incremental. CEG's assumptions in relation to demand to be served by new investment vastly overstates the position in relation to the regulated services.

CEG model violates the Dobbs framework assumption of zero cross-price elasticity

128. CEG fall into similar errors in considering the estimates of demand elasticity for the legacy copper-based services, and their relationship with estimates of demand elasticity for fibre-based services. It is unclear to Spark that they deal adequately with the Dobbs framework assumption that cross-price elasticity between the legacy copper-based and non-deferrable new fibre-based UFB service investments is zero. The Commission has selected a FTTH network as the modern equivalent asset for the existing copper-based network, and it is clear that in the real world, this network supplies bitstream services at small additional cost.

129. Although CEG recognise this concern, and seek to deal with it by modelling a range of scenarios, it is not clear to us that this robustly deals with the problem. It is possible that the attempts made to address this might partially deal with the issue. In the absence of adapting the model to deal with non-zero cross-price elasticities, (and addressing other criticisms), and demonstrating that the resulting model framework robustly deals with this issue, it is not certain that the CEG treatment has dealt properly with the issue.

130. Even if it is legitimate for CEG to take account of the unregulated UFB services in this analysis, (and we think it is not), we find it hard to imagine that demand for UFB services will be wholly independent of demand for the legacy service. The Dobbs framework assumption of zero cross-price elasticity requires that they are. The CEG model does not appear to address this issue in a robust way. The inclusion of fibre-based services in the CEG model means that its results cannot be treated as relevant to the WACC setting process

CEG model uses a questionable estimate of maximum willingness to pay

131. Network Strategies advise a range of concerns around the approach CEG use to estimate the assumptions in relation to willingness to pay. As noted above, the Frontier-Dobbs model is highly sensitive to these assumptions. The CEG assumptions of willingness to pay, (ignoring errors) are between two and four times the estimate made by Network Strategies based on the Commission's 2012 demand side study. Given the sensitivity of the CEG adaption of the Frontier-Dobbs model to this assumption, the uncertainty around the accuracy of the assumption raises serious additional doubts as to the validity of the CEG model results.

132. Network Strategies comment further on other assumptions in relation to demand growth estimates, and the use of current prices in modelling retail demand rather than wholesale demand. They provide a view on a further testing of parameters and modifications to assumptions which would be necessary if the Commission were to engage further with the CEG model approach. Spark's most significant concern with the CEG model in this regard, is that it fails to reflect an incremental approach in that it assumes the retail price as the extreme price at which customers opt out, rather than the fibre increment, and appears to appropriate value which is already provided by copper based broadband.

The results of the CEG implementation of the Frontier-Dobbs model are not robust

133. Spark thinks that the issues raised in relation to the CEG model by Network Strategies, and its own assessment of the CEG model results are so significant, that the results of the model are not relevant to the issue of a WACC uplift.
134. As discussed above, the purpose of an uplift to the core estimate of regulatory WACC is to correct for error in estimation which would give rise to a material level of asymmetric risk. The Dobbs framework, and the CEG model do not adequately inform this process. The results of the CEG implementation of the Frontier Dobbs model do not provide specific guidance of any uplift required to correct this. Even if the CEG model could tell us something about the necessity for an uplift to the regulatory WACC, the CEG implementation has such significant flaws that any such indication would be unreliable.
135. Spark agrees with the conclusion by Network Strategies, that the CEG implementation of the Frontier-Dobbs model should not be given any weight in considering the issue of an uplift to the core estimate of regulatory WACC.

END

Attachment 1 WIK On the Commerce Commission’s analytical frameworks for considering an uplift to the TSLRIC price and/or WACC

Provided as a separate document.

Attachment 2: NWS Analytical frameworks for an uplift to the TSLRIC price and WACC

Provided as a separate document.

Attachment 3: NWS Examining welfare effects of UCLL and UBA uplift

Provided as a separate document.