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Further draft pricing review determination for Chorus' unbundled copper local loop service

Under section 47 of the Telecommunications Act 2001

Further draft determination

Date: 2 July 2015

The Commission: Dr Stephen Gale

Pat Duignan

Elisabeth Welson

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Contents

List of defined terms and abbreviations

ACCC	Australian Competition and Consumer Commission
Access seeker	Has the meaning set out in section 5 of the Act
Act	Telecommunications Act 2001
ADSL	Asynchronous digital subscriber line
Amendment Act	Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011
BAU	Business as usual
BSS	Business support system
BUBA	Basic UBA
CAGR	Compound Annual Growth Rate
Capex	Capital expenditure
CERA	Canterbury Earthquake Recovery Authority
CGPI	Capital Goods Price Index
CI	Confidential information granted additional protection in accordance with orders issued by the Commerce Commission under section 100 of the Commerce Act 1986. Such information is only made available to nominated counsel and external experts in accordance with the orders
Common costs	Generally used to refer to costs not directly attributable to any individual service or sub-group of services; they are attributed to all services See also “shared costs”
CORE	Core network
CPE	Customer premises equipment
CPI	Consumer price index
CPP	Customised price-quality path
DBA	Danish Business Authority
DORC	Depreciated optimised replacement cost
DPP	Default price-quality path
DSL	Digital subscriber line
DSLAM	Digital subscriber line access multiplexer
EC	European Commission
EDB	Electricity distribution business
End-user	Has the meaning set out in section 5 of the Act
EPMU	Equi-proportional mark-up
ETP	External termination point
EUBA	Enhanced UBA
FDS	First data switch
FPP	Final pricing principle for the relevant service as set out in Schedule1 of the Act
FTTH	Fibre-to-the-home
FTTN	Fibre-to-the-node
FWA	Fixed wireless access
GigE	Gigabit Ethernet
GPON	Gigabit Passive Optical Network

HFC	Hybrid fibre-coaxial
HSNS	High Speed Network Service
ILECs	Incumbent local exchange carrier
IM	Input methodologies
IP	Internet protocol
IPP	Initial pricing principle for the relevant service as set out in Schedule 1 of the Act
IRD	Inland Revenue Department
LAP	Local aggregation path
LCI	Labour cost index as produced by Statistics New Zealand
LFC	Local fibre company
LRIC	Long run incremental cost
LTE	Long-term evolution
MDF	Main distribution frame
MEA	Modern equivalent asset
MPF	Metallic path facility
NPV	Net present value
NRA	National Regulatory Authority
NZIER	New Zealand Institute of Economic Research
ODF	Optical distribution frame
OFDF	Optical fibre distribution frame
Opex	Operating expenditure
ORC	Optimised replacement cost
P2P	Point-to-point
PPI	Produce Price Index
PPP	Purchasing power parity
PSTN	Public switched telephone network
RAB	Regulatory asset base
RBI	Rural broadband initiative
RBNZ	Reserve Bank of New Zealand
RFP	Request for proposals
RI	Restricted information under the orders issued by the Commerce Commission under section 100 of the Commerce Act 1986. Such information is only made available to nominated persons in accordance with the orders
RMA	Resource management act
RSP	Retail service provider. We use the term RSP where the Act uses "access seeker"
Shared costs	Generally used to refer to costs not directly attributable to any individual service, but that can be attributed to a sub-group of services (rather than to all services). TERA uses "joint costs" See also "common costs"
SLU	Sub-loop UCLL
SLU STD	We use SLU STD to refer to the part of the document that relates to sub-loop UCLL, but not to sub-loop co-location or sub-loop backhaul
STD	Standard terms determination

TSLRIC	Total service long-run incremental cost
TSO	Telecommunications Service Obligations
TSO lines	Lines which had active connections on 20 December 2001, and to which Chorus is obliged to maintain a baseband voice connection as part of its Telecommunications Service Obligations
TSO-derived boundary	A geographic footprint modelled around the TSO lines. We have used data about historic customer locations for each exchange service area to derive complex polygons. The areas caught within the complex polygons collectively form the TSO footprint
UBA	Unbundled bitstream access
UBA increment	Refers to the “additional costs” component of the UBA service
UBA STD	UBA standard terms determination
UBS	Unbundled bitstream service
UCLF	Unbundled copper low frequency service
UCLL	Unbundled copper local loop
UCLL STD	UCLL standard terms determination
UFB	Ultra-Fast Broadband
ULL	Unbundled local loop
USO	Universal service obligation
VoIP	Voice over internet protocol
WACC	Weighted average cost of capital

EXECUTIVE SUMMARY

1. This further draft determination concerns the unbundled copper local loop (UCLL) and sub-loop services (SLU) which provide access to the basic essential Chorus infrastructure upon which most fixed line broadband and voice services are provided in New Zealand. This infrastructure allows New Zealanders to conduct commerce, make phone calls and participate online.

2. Our further draft decision for UCLL is to set nominal monthly prices over the five-year regulatory period shown in the table below.

Service	Year 1	Year 2	Year 3	Year 4	Year 5
UCLL	\$26.74	\$27.18	\$27.63	\$28.09	\$28.56
SLU	\$11.66	\$11.79	\$11.92	\$12.05	\$12.19

3. UCLL is a significant part of Chorus' business where basic copper services represent over half of its revenues.[1] It also represents a significant part of the costs that make up the retail price of broadband packages in New Zealand. The combined UCLL and unbundled bitstream access (UBA) draft charges of \$37.89 in the first year of the regulatory period would represent over half the costs of a \$75 retail service.[2] The UCLL charge is the predominant amount at \$26.74.

4. While next generation infrastructure is being rolled out via the Ultra-Fast Broadband initiative (UFB), today Chorus' copper network is still the predominant infrastructure over which fixed broadband is provided to New Zealanders.

5. The UCLL price is determined based upon the geographically averaged Total Service Long Run Incremental Cost or TSLRIC, as required of the final pricing principle (FPP) by the Telecommunications Act 2001 (Act). TSLRIC is comprised of the annuitised replacement cost for the network plus the operating costs. Our view is that the relevant replacement is a fibre connection to every home and business except for the longest and the lowest speed lines (and therefore the lowest capacity) where fixed wireless is costed. This TSLRIC cost is reduced to the extent Chorus has not met the cost, for example for trenches in new sub-divisions.

6. In order to build up the TSLRIC costs we have used inputs from objective sources where possible. We have used geo-spatial specialists to map the extent of the least cost routing of the network; we have taken trenching costs from civil engineering specialists Beca; and we have used Oxera and Dr Martin Lally in estimating the financial costs through the WACC. We have used TERA's international engineering and modelling expertise for costing equipment and in combining all of the various inputs in a TSLRIC model.

[1] See Chorus Annual Report 2014, Appendix two.
[2] For more details see Commerce Commission "Price trends in retail fixed-line broadband services, 2011 to 2014, and the impact of wholesale price changes" June 2015.

7. The UCLL charges in this further draft decision include non-recurring charges (NRC). NRC are levied on access seekers to recover costs incurred separate to the monthly recurring charges; they include for instance end-user installation services which are performed by Chorus. As part of the final pricing principle exercise, these charges are being modelled separately and for the first time. In determining a price for these NRC we have compared the current charges to both international task times and national labour rates, where possible. Overall the changes we have made have resulted in a 30% reduction in forecast NRC.

8. Some level of uncertainty is inherent in any TSLRIC exercise, because of the many judgements required to be made when building the model. Where we believe the longer term costs to end-users from setting too low a price are greater than for the costs of too high a price, this can lead us to select a higher price. This could be the case with regard to the speed of migration to the UFB or failure to signal sufficient returns to investment. In this further draft we have concluded that it is not worthwhile for end-users to pay a premium to mitigate these risks given the benefits are far less certain than for the energy sector where we raised the allowed return on capital.

9. In coming to this view we sought additional independent academic advice from Professor Cambini, as well as advice from Professor Vogelsang and Professor Dobbs, and consultancy advice from Oxera, whom we used in the consideration of similar issues in the energy sector.

10. The final FPP prices we set through this price review determination process will replace the initial pricing principle (IPP) prices from the date of the final determination expected in December 2015, and will not be backdated. This is the further draft decision of Commissioners Gale and Welson based on a revised view that backdating will not be likely to promote competition in telecommunications markets for the long-term benefit of end-users. Commissioner Duignan disagrees with this view and considers that the start date for the FPP prices should be 1 December 2014, with retail service providers (RSPs) compensating Chorus accordingly for the difference between the IPP and FPP prices during this year.

11. This is the first time we have produced a detailed TSLRIC model for price setting UCLL in New Zealand. Previously we have set the prices by benchmarking against TSLRIC models from other comparable countries.

12. We have received emails from over 50,000 consumers in New Zealand prompted by a campaign launched by Spark.[3], Greater consumer participation in these decisions is welcomed by us. While these emails were received outside of a formal consultation window, they reiterated one specific issue raised by Spark in its submissions, the apparent disparity between charges in New Zealand and in Europe.

13. Our experience with international benchmarking dates back to our first determination of the UCLL service in 2007. At that time we used a variety of

[3] Correct on 25 June 2015.

benchmarks, including Europe, but also those of US State Regulators. The exclusion of the US State benchmarks largely skews the results of this benchmarking downwards.

14. There is a limit to which benchmarking has a role to play given a request for an FPP is indicative that the prices set under an IPP, which are based on international benchmarks, are believed to not reflect costs in New Zealand. TSLRIC modelling reflects New Zealand costs.

15. Nonetheless, in response to concerns expressed about international comparisons, we requested TERA to examine the New Zealand model against other regulatory decisions for which public information is available. These comparators are Ireland, France, Denmark and Sweden.[4] TERA has advised us that one of the main factors driving higher costs for New Zealand is the spatial dispersion of end-users driving a higher network length per customer. In effect, customers in New Zealand tend to be more spread out and thus it costs more to provide the infrastructure to reach them. Even for Sweden which, on a national basis, has a similar population density to New Zealand, population is not so dispersed there.[5] TERA has found that the network length per line is 64.3 metres for New Zealand compared to 41.2 for France, 51.2 for Sweden and 55 for Denmark. Related factors include trenching costs and the extent of aerial deployment. TERA's advice reveals the modelled average trenching costs in New Zealand (85) are higher than Sweden (52) or Denmark (34), but lower than France (88). New Zealand specific data for all of these factors is accommodated in the modelling we have undertaken.

4 While the French regulator does not use a TSLRIC model to set prices and, consequently, the regulated price is not comparable to our TSLRIC estimate, there is a TSLRIC model available for France. Whilst some information is available for Ireland, it is not extensive enough to calculate the network length per line or other more detailed metrics.

5 The intuitive story for this is Sweden has large areas where no one lives.

Introduction and process

Purpose of this document

16. We are in the process of setting prices for the unbundled copper local loop (UCLL) and sub-loop unbundled copper local loop (SLU) services provided by Chorus, using the final pricing principle (FPP) as set out in the Telecommunications Act 2001 (Act).

17. For UCLL the FPP is "TSLRIC", which we discuss in Chapter 1.

18. This further draft determination sets out, and seeks the views of interested parties on, how we have determined:

    18.1 the draft TSLRIC prices for monthly recurring charges for the UCLL and SLU services;[6]

    18.2 the draft TSLRIC prices for non-recurring charges (the service transaction charges and the ancillary services charges); and

    18.3 our further draft decision on backdating.

19. Accordingly, we have determined the following draft monthly recurring charges for the UCLL and SLU services:

National (geographically averaged)	Year 1	Year 2	Year 3	Year 4	Year 5
UCLL	26.74	27.18	27.63	28.09	28.56
SLU	11.66	11.79	11.92	12.05	12.19

20. This further draft determination includes our current view for the non-recurring charges (Chapter 5). In determining a price for these NRC we have updated the current charges based on either international task times or national labour rates, where possible. Overall the changes we have made have resulted in a 30% reduction in forecast NRC.

21. This further draft determination does not impose any backdating. We have decided not to exercise our discretion to implement any backdating because we consider it would not best give effect, or be likely to best give effect, to section 18. Commissioner Duignan considers backdating to 1 December 2014 should apply as explained in Chapter 6.

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6 The unbundled copper low frequency (UCLF) prices automatically follow the prices for equivalent UCLL (Commerce Commission "Review of the Standard Terms Determination for Chorus's Unbundled Copper Low Frequency Service under section 30R of the Telecommunications Act 2001" 24 April 2014, Decision [2014] NZCC 9, at [11] and [51]).

22. As explained further below, we have been consulting on issues for the UCLL and UBA services at the same time.

Background

The UCLL service

23. The UCLL service is a designated access service described in the Act as follows:[7]

Chorus's unbundled copper local loop network

Description of service:	A service (and its associated functions, including the associated functions of operational support systems) that enables access to, and interconnection with, Chorus's copper local loop network (including any relevant line in Chorus's local telephone exchange or distribution cabinet)

24. The UCLL service, as described by the Act, includes local loops connecting end-users to local exchanges (on non-cabinetised lines) and local loops connecting end-users to distribution cabinets (on cabinetised lines).

25. We made two separate standard terms determinations (STD) for the UCLL service: the UCLL STD for non-cabinetised lines and the SLU STD for cabinetised lines.

    25.1 In November 2007, we published a STD for Telecom's unbundled copper local loop network (the UCLL STD). [8] In the UCLL STD, following consultation with interested parties, we specifically excluded local loops connecting end-users to distribution cabinets.

    25.2 In June 2009, we published a further STD for Telecom's unbundled copper local loop (the SLU STD). [9] The SLU STD includes three services: the sub-loop UCLL service, the SLU co-location service, and the SLU backhaul service.

26. In this draft determination we refer to the SLU STD only in relation to the sub-loop UCLL service, which we call SLU. The SLU STD sets the SLU service in reference to local loops connecting end-users to distribution cabinets.

27. When we refer to UCLL or the UCLL service in this document, we refer to both the UCLL and SLU (sub-loop UCLL) services as described by their respective STDs, unless otherwise specified.

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7 Schedule 1, Part 2, Subpart 1.

8 Commerce Commission "Standard Terms Determination for the designated service Telecom's unbundled copper local loop network" 7 November 2007, Decision 609.

9 Commerce Commission "Standard Terms Determination for the designated services of Telecom's unbundled copper local loop network service (Sub-loop UCLL), Telecom's unbundled copper local loop network colocation service (Sub-loop Co-location) and Telecom's unbundled copper local loop network backhaul service (Sub-loop Backhaul)" 18 June 2009, Decision 672.

The Act links the price of the UCLF service to the prices we set in this pricing review determination

28. The unbundled copper low frequency (UCLF) service allows access seekers (also referred to as retail service providers (RSPs)) to lease the low frequency portion of Chorus' local loop network. [10] The UCLF service is available on both cabinetised and non-cabinetised lines. In November 2011 we set the initial terms and prices for the UCLF service in the UCLF STD, which were amended in April 2014. [11] The UCLF service's prices automatically follow the prices for equivalent UCLL service. [12] We discuss the UCLF service's prices further in Chapter 1.

The current competitive situation in New Zealand is characterised by fibre deployment through the subsidised UFB initiative

29. In 2011 the Government implemented the Ultrafast Broadband (UFB) initiative, which aims at expanding and developing New Zealand's broadband services. At that time, the UFB initiative involved the deployment of a fibre-to-the-home (FTTH) network, covering 75% of New Zealand's population. The deployment is facilitated by a government subsidy, and is being undertaken by either Chorus or one of three local fibre companies (LFCs), depending on the region.

30. As explained by the Court of Appeal, in 2011, following Telecom's decision to participate in the UFB initiative, the Act was amended:[13,14,15]

    30.1 Chorus was structurally separated from Telecom on 1 December 2011 (the Telecom-Chorus separation date).

    30.2 Chorus was prohibited from providing retail services, and entered into undertakings to provide wholesale services on a non-discriminatory basis. [16]

    30.3 The structural separation meant a retail-minus approach could no longer be used to determine the price for the UBA service, as Chorus' revenue would be determined by Telecom's pricing strategy.[17]

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[10] As introduced by the Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011.

[11] Commerce Commission "Standard terms determination for the designated service of Chorus's unbundled copper low frequency service" 24 November 2011, Decision 738; and Commerce Commission "Review of the Standard Terms Determination for Chorus's Unbundled Copper Low Frequency Service under section 30R of the Telecommunications Act 2001" 24 April 2014, Decision [2014] NZCC 9.

[12] Commerce Commission "Review of the Standard Terms Determination for Chorus's Unbundled Copper Low Frequency Service under section 30R of the Telecommunications Act 2001" 24 April 2014, Decision [2014] NZCC 9, at [11] and [51].

[13] *Chorus v Commerce Commission* [2014] NZCA 440 at [16].

[14] Telecommunications (TSO, Broadband, and Other Matters) Amendment Bill 2010 (250-2) (select committee) at 1–2.

[15] Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011 (the 2011 Act).

[16] Section 51 of the 2011 Act, inserting new part 2A into the 2001 Act, including new subpart 3 (line of business restrictions).

[17] The 2011 Act specified that Chorus's UBA price set in Telecom's standard terms determination of 12 December 2007 was to continue to apply to existing lines until three years from the 30 November 2011 separation of Chorus and Telecom (1 December 2014) – section 79(2) of the 2011 Act.

30.4 Section 18(2A) was inserted,[18,] in particular in connection with the UFB initiative, providing that consideration must be given to the "incentives to innovate that exist for, and the risks faced by, investors in new telecommunications services that involve significant capital investment and that offer capabilities not available from established services."

Developments since the Telecom-Chorus separation date

31. Since the Telecom-Chorus separation date, Chorus has been the operator of the fixed line access network that carries voice and data traffic between local exchanges and end-user premises in New Zealand. This is sometimes referred to as the "copper network" with each individual link referred to as a "local loop".

32. Access seekers, also referred to as retail service providers (RSPs), who wish to offer broadband (internet) services utilising the copper network may do so by purchasing UCLL, SLU or the unbundled bitstream access (UBA) service from Chorus. These services are regulated under the Act.

33. An access seeker may take the UCLL or SLU service and install its own equipment in the exchange or cabinet. This is often referred to as "unbundling". Alternatively, they may take the UBA service, which allows access seekers to offer a broadband service to end-users without needing to install their own equipment in the exchange or cabinet.

34. The UFB initiative results in voluntary migration from the copper network to the UFB fibre network, thereby reducing demand on the copper network over time. Where the UFB network is built by the LFCs it will provide competition for Chorus's copper network over the regulatory period.[19]

Process to date

We determined a benchmarked price for the UCLL service under the IPP in the Act

35. Following the 2011 amendments to the Act, we initiated a UCLL benchmarking review.[20] The purpose of the UCLL benchmarking review was to update the benchmarking data in order to determine UCLL service monthly rental and connection charges and set geographically averaged prices.[21] Our 3 December 2012 price determination for the UCLL service:

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18 Section 19 requires us to consider "the purpose set out in section 18". That purpose is found in section 18(1). Section 18(2) and (2A) identify particular matters that we are required to take into account when making the overall consideration of what promotes competition for the long-term benefit of end-users.

19 The actual pace of migration remains uncertain.

20 This was our initiative under section 30R of the Act and in accordance with the standard terms determination sections of the Act at sections 30K-30Q.

21 Commerce Commission "Final determination on the benchmarking review of the unbundled copper local loop service" (3 December 2012), NZCC 37, paragraph [32].

35.1 determined a new geographically averaged price for the UCLL STD of $23.52 per line per month, with the new geographically averaged price to come into effect on 1 December 2014;[22]

35.2 determined a new geographically averaged price for the SLU STD of $14.21 per line per month, with the new geographically averaged price to come into effect on 1 December 2014;

35.3 updated the geographically averaged price for the UCLF STD to $23.52 per line per month, with the new price to come into effect immediately (that is, from 3 December 2012);[23]

35.4 updated the non-urban and urban monthly rental prices in the UCLL STD to $35.20 and $19.08 respectively, with the prices coming into effect immediately and applying until 30 November 2014; and

35.5 updated the non-urban and urban monthly rental prices in the SLU STD to $21.26 and $11.52 respectively, with the prices coming into effect immediately and applying until 30 November 2014.

36. In November 2013 we also set a new IPP price for the UBA service.

Our consultations during the process to determine TSLRIC cost-based prices for the UCLL services

37. In February 2013 we received five applications for a pricing review determination of the prices we set for the UCLL service.[24] We also received applications for a pricing review determination in accordance with the UBA FPP in January 2014. We have since consulted on issues for the UCLL and UBA services at the same time.

38. Our consultation process as outlined below has been a critical factor in developing the reasoning that underlies our thinking to date.

39. In December 2013 we published a UCLL process and issues paper, which set out and sought views on:[25]

39.1 our proposed process and framework for the cost modelling and pricing review determination of the UCLL service; and

39.2 a number of conceptual issues associated with the TSLRIC methodology.[26]

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22 Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011, s 73(3).

23 The UCLFS price was geographically averaged from separation day, 1 December 2011, when the service was introduced.

24 Applications were received from Chorus New Zealand Ltd, Telecom New Zealand Ltd (now Spark New Zealand Ltd), Vodafone New Zealand Ltd, CallPlus Ltd and Kordia Ltd. Kordia Ltd has since withdrawn its application. This has not affected the scope of our pricing review determination.

25 Commerce Commission "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" 6 December 2013.

40. In January 2014 we published a supplementary paper to the UCLL process and issues paper, seeking views from interested parties on what happens at the expiry of the UCLL pricing review determination and how the STD prices can be updated in future.[27]

41. In February 2014 we released a UBA process and issues paper.[28]

42. Following our consideration of submissions and cross submissions, in March 2014 we published further consultation papers which sought views on:[29]

    42.1 the role of relativity in our price setting process;[30] and

    42.2 the preliminary legal views of our external legal counsel Dr James Every-Palmer on (i) the relevant considerations for determining the MEA for the UCLL service and (ii) our discretion to backdate the FPP prices.

43. Also in March 2014 we published a technical consultation paper on our proposed framework for estimating the weighted average cost of capital (WACC) for the UCLL and UBA pricing reviews.[31]

44. Following submissions and cross submissions on our WACC technical consultation paper, we published advice we had received from:

    44.1 Dr Martin Lally, reviewing submissions on our proposed approach to estimating the cost of debt; and

    44.2 Oxera Consulting (Oxera), reviewing the company-specific components of the WACC for the UCLL and UBA services, such as the asset beta and leverage components.

45. Two workshops were held with Commission staff, on 19 December 2013 and 28 March 2014, to assist interested parties with developing their understanding of TSLRIC.

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26 These included: (i) the range of approaches to TSLRIC cost modelling; (ii) the features and functionality of the UCLL service, and their relevance to selecting the modern equivalent asset (MEA) for our modelling of the service; and (iii) a range of approaches to key modelling decisions including depreciation, demand, cost allocation, cost of capital and operating expenditure (opex).

27 Commerce Commission "Process and issues for determining a TSLRIC price for Chorus' unbundled copper local loop service - supplementary paper on expiry date" 13 January 2014.

28 Commerce Commission "Determining a TSLRIC price for Chorus' unbundled bitstream access service under the final pricing principle – Process and issues paper" 7 February 2014.

29 Commerce Commission "Further consultation paper on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle" 14 March 2014; and Commerce Commission "Further consultation paper on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – supplementary paper" 25 March 2014.

30 Section 19(b) of the Telecommunications Act 2001, together with Schedule 1, requires us to consider the relativity between the UCLL service and the UBA service regarding the application of section 18.

31 Specifically, the paper: (i) sought views on the approach to estimating certain WACC parameters for the UCLL and UBA services; (ii) discussed the linkages with the cost of capital input methodologies (IMs) we determined under Part 4 of the Commerce Act 1986; and (iii) highlighted issues on which we would be seeking independent expert advice.

46. In April 2014 we held a modelling methodology presentation for interested parties with our external consultants, TERA Consultants (TERA), where they shared their knowledge and experience regarding TSLRIC cost modelling processes.[32]

47. In June 2014 we published a TSLRIC literature review on UBA and UCLL costing, prepared by TERA.[33]

48. In July 2014 we published a regulatory framework and modelling approach paper, seeking views on the following:[34]

    48.1 our preliminary view of the regulatory framework for our UCLL and UBA TSLRIC cost modelling exercise; [35]

    48.2 our preliminary views on a number of fundamental assumptions for the development of a TSLRIC cost model for the UCLL and UBA services; [36]

    48.3 our preliminary views on backdating and the length of the regulatory period;

    48.4 our updated process, which we updated in response to (i) concerns raised by parties during the March 2014 consultation and (ii) requests to consider additional matters as part of the TSLRIC cost modelling exercise; and

    48.5 expert papers prepared by Professor Ingo Vogelsang and TERA.

49. Following our consultation on the July 2014 regulatory framework and modelling approach paper we began modelling the TSLRIC cost of the UCLL and UBA services.

50. In September 2014 we published an open letter to parties in response to concerns expressed in submissions and cross submissions to our July 2014 regulatory framework and modelling approach paper.[37] We highlighted that:

    50.1 we have consulted more extensively than we were obliged to under the statutory requirements in the Telecommunications Act;

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32 Building a TSLRIC model is a significant undertaking. We appointed TERA to develop our TSLRIC models for us given its recent experience in building TSLRIC models in other jurisdictions. TERA were selected for the role after the following process: we issued a request for proposals (RFP) for modelling consultants on 22 January 2014, asking for proposals by 14 February 2014; following review of proposals by Commission staff, and input from a co-opted Australian Competition and Consumer Commission (ACCC) staff member, we identified a shortlist of consultants to interview in Wellington in the week of 10 March 2014; based on these interviews and the review of proposals, we identified TERA as our preferred consultant.

33 TERA Consultants “TSLRIC literature review on UBA and UCLL costing approaches” June 2014.

34 Commerce Commission, "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014.

35 These included the role of section 18, our TSLRIC objectives, our requirement to set forward-looking costs and the implications of this on the potential re-use of Chorus’ assets, as well as additional legal requirements.

36 Including the choice of the MEA, demand, depreciation, tax, price profiles, and cost allocation.

37 Commerce Commission "Open letter to parties regarding process" 5 September 2014, p. 2.

50.2 we have shared aspects of our framework as it has emerged and developed, and shared a more complete picture as some of our views have crystallised; and

50.3 our approach to consultation has been adopted to assist parties with developing their understanding and engaging throughout the process, rather than working in isolation and sharing our fully developed thinking at the draft determination stage.

51. Also in September 2014 we released a consultation paper on our proposed approach to setting prices for the non-recurring charges, which are some of the non-recurring charges in the UCLL STD.[38]

52. In December 2014 we published our draft determination paper for the UCLL service.[39] Our draft decisions were:[40]

52.1 the monthly rental price for the UCLL service was $28.22; and

52.2 the monthly rental price for the SLU service was $14.45.

53. In December 2014 we also published our draft determination paper for the UBA service. The draft total monthly price for the Basic UBA service was $38.39[41].

54. These draft determination papers did not include our draft decision on non-recurring charges.

55. We highlighted that these prices were not final, as there were a number of matters that we still needed to work through with industry which could impact on the final prices.[42]

56. On 19 December 2014, we published a process and issues update paper for UCLL and UBA pricing review determinations where we: [43]

56.1 provided an update on the process, including responding to extension requests, ie, we granted an extension of one month for submissions on the

38 Commerce Commission "Consultation on setting prices for service transaction charges for UBA and UCLL services" 25 September 2014. The paper set out our preliminary views, and sought submissions, on (i) the non-recurring charges; (ii) the appropriate approach to setting prices for the non-recurring charges; and (iii) whether we can merge some non-recurring charges into other charges.

39 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014.

40 That draft determination did not set out the non-recurring charges and our approach to backdating.

41 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014.

42 These included (i) submissions from the industry on our preliminary decision on the inputs and design of the model; (ii) our preliminary decision on non-recurring charges; (iii) our preliminary decision on whether or not there should be backdating of prices; and (iv) potential errors and corrections to data.

43 Commerce Commission "Process and issues update paper for UCLL and UBA pricing review determinations" 19 December 2014.

UCLL and UBA draft determination papers, to allow interested parties to make considered submissions; and

56.2 shared our emerging views and sought submissions on backdating.

57. We received submissions and cross submissions on the draft determination papers for UBA and UCLL services between February and May 2015.[44,45]

58. On 2 April 2015 we published a paper:[46]

58.1 outlining the process and agenda for the upcoming conference, and

58.2 updating parties on our approach to testing and quantifying the need for any potential uplifts to the TSLRIC price for UCLL and/or the mid-point weighted average cost of capital (WACC) estimate for UCLL and UBA. This was accompanied by a paper from Professor Carlo Cambini.[47]

59. On 14 April 2015 we published:

59.1 a report from TERA with questions regarding Chorus' model,[48] and

59.2 a report from Analysys Mason on Chorus' UCLL and UBA models.[49]

60. From 15 April 2015 to 17 April 2015 we held a conference, the purpose of which was to clarify and test matters that arose during the submissions process. The transcript is available on our website.

61. In May 2015 we received submissions on analytical frameworks for considering an uplift to the TSLRIC price and/or WACC.

44 In 3 February 2015 Vodafone requested an extension to the deadline for cross submissions on geospatial modelling, which was allowed by us (Vodafone "Deadline for submissions on UBA and UCLL FPP draft determinations – request for extension to deadline for cross submissions" 3 February 2015 and Commerce Commission "Request for extension to deadline for cross submissions: UBA and UCLL FPP draft determinations" 5 March 2015).

45 We received letters from Vodafone and Spark expressing concern that the CEG cross submission introduced new material, and regarding their inability to respond to CEG's evidence (Spark "UBA and UCLL Draft FPP Review Cross submission – CEG Uplift report" 31 March 2015; and Vodafone "Admission on CEG Report in Cross submission Process" 31 March 2015). We accepted that not allowing other parties to this process the opportunity to cross-submit on CEG's evidence prior to the release of our further draft determinations might create fairness issues. Therefore, we decided to allow time for parties to cross-submit on CEG's evidence (Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 2 April 2015, paragraphs [18]-[22]).

46 Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 5 March 2015" 2 April 2015.

47 Prof. Carlo Cambini "Economics aspects of migration to fibre and potential welfare gains and losses from an uplift to copper prices" 15 March 2015.

48 TERA "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services - Questions regarding Chorus model" January 2015.

49 Analysys Mason "Report for Chorus to provide to the Commerce Commission - Response to TERA questions regarding the Chorus UCLL and UBA models" 29 January 2015.

Criticisms regarding our process

62. Chorus favoured a speedier decision-making process,[50] while Wigley and Company argued that our process is being conducted too quickly. [51] Wigley and Company also submitted that:[52]

62.1 we must hold a conference after this further draft determination;

62.2 we have not properly engaged with their submissions; and

62.3 our draft decisions are not accompanied by proper reasons.

63. We disagree with Chorus, and Wigley and Company. In this regard:

63.1 we believe that our timetable and consultation process are appropriate. We have conducted a number of consultation rounds throughout the UCLL and UBA FPP price review determination process and have consulted more extensively than we are obliged to under the statutory requirements in the Act; [53]

63.2 we are not required to hold a conference after this further draft determination.[54] We accept that in many previous processes we held conferences after the statutory drafts. However, in this process we considered it appropriate to hold the 15 April 2015 to 17 April 2015 conference before the statutory draft;[55] and

63.3 we have reviewed and considered all submissions, but we do not consider that in providing reasons as part of a draft or (final) pricing review determination we are obliged to discuss or refer to all submissions made.

50 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations", 20 February 2015, paragraph [72].

51 Wigley Company latest submission was presented on behalf of InternetNZ, Consumer, TUANZ, Snap and CallPlus (Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [1.1].

52 Ie, Letter from Wigley and Company to Stephen Gale (Telecommunications Commissioner) enquiring if we will revisit our timetable (13 March 2015) and "Commentary on behalf of consumer interests on Commerce Commission paper dated 2 April 2015 as to TSLRIC and WACC uplifts" 13 April 2015.

53 Eg, Commerce Commission "Open letter to parties regarding process" 5 September 2014, p. 2.

54 As previously explained by us to Wigley and Company (Commerce Commission "RE: FPPs" 24 September 2014).

55 We note that the conference is an additional consultation step not required by the Act. That is because we have, in terms of section 50 of the Act, consulted with persons other than parties to the determinations by inviting written submissions on our papers from all persons Section 50 of the Act: "If the Commission considers that persons, other than the parties to the determination, have a material interest in the matter to be determined, the Commission must, before preparing a determination under section 51, <u>either consult those persons or hold conferences</u> in relation to the matter" (emphasis added).

64. Wigley and Company also argued that we must quantify the impact of our decisions.[56] Our view is that we should quantify the benefits and detriments of our decisions only where feasible and useful.

65. Wigley and Company also recommended that we require experts to confirm in writing that they have complied with the expert code of conduct. We do not normally consider it necessary to request experts to sign the expert code of conduct. However, experts should confirm their compliance with the code of conduct for expert witnesses contained in the High Court rule in their submissions to this further draft determination if they want to attest their impartiality.

66. We would like to take this opportunity to highlight that we will continue to progress the FPP project in accordance with our statutory obligations. We are confident that our process to date has been robust, and that our proposed steps between now and issuing a final decision in December 2015 are appropriate. In this regard, we stress that:

    66.1 we will continue to follow the process with an open mind; and

    66.2 we will continue to remain flexible and open to making adjustments to our process (including the need for another conference) if new issues cause us to revisit our decisions in the draft determinations, including modelling choices.

Other data and expert advice used as part of our pricing review

67. As mentioned above, we appointed TERA to develop our TSLRIC models for us given its recent experience in building TSLRIC models in other jurisdictions.

68. We have also sought specialised expert advice on specific topics from Professor Ingo Vogelsang, Dr James Every-Palmer, Dr Martin Lally, Professor Carlo Cambini, Professor Ian Dobbs and Oxera Consulting (Oxera).

69. We sourced information from a number of experts to provide inputs for our TSLRIC model. These included:

    69.1 geospatial data from Corelogic and Landcare Research;

    69.2 trenching and duct cost data from Beca; and

    69.3 price trend data from Statistics New Zealand, World Bank, NZIER and Bloomberg.

70. As part of our modelling, we also sourced data on Telecommunications Service Obligation (TSO) areas from internal analysis that we carried out on TSO areas.[57]

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56 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraphs [6.8] to [6.16] and letter from Wigley and Company to Stephen Gale (Telecommunications Commissioner) enquiring if we will revisit our timetable (13 March 2015).

57 See Commerce Commission "Determination for TSO Instrument for Local Residential Service for period between 1 July 2002 and 30 June 2003" (24 March 2005).

71. In addition, we sourced extensive information to assist with modelling from a number of parties, including Chorus, by way of compulsory information notices issued under section 98 of the Commerce Act 1986.[58] We also note that interested parties have supplied their own data and models.

Structure of this document

72. The main body of this draft determination has six Chapters:

72.1 Chapter 1 outlines the regulatory framework under which we are required to set a TSLRIC price for the UCLL service.

72.2 Chapter 2 explains our approach to determining the cost of providing the UCLL service. We describe the steps we have taken to determine the annualised TSLRIC cost, and summarise the further draft decisions we have made at each step.

72.3 Chapter 3 explains how we propose to convert TSLRIC costs into a monthly unit price, and set the prices for the UCLL STD and SLU STD services.

72.4 Chapter 4 explains our approach to price adjustments that we consider best give, or are likely to best give, effect to the section 18 purpose statement, having considered matters including relativity.

72.5 Chapter 5 explains our approach, reasons and further draft decisions to with non-recurring charges for the UCLL service.

72.6 Chapter 6 outlines the statutory context of backdating and explains our approach to this issue.

73. The Attachments to this draft determination then discuss in more detail our proposed approach, and reasons for our approach, to determining key inputs to our TSLRIC model.

74. Attached to this paper we have also published a number of papers prepared by our expert consultants, including:

74.1 a model reference paper, a model specification paper (public and confidential versions), and model documentation paper (public and confidential version) for the recurring charges cost model prepared by TERA;

74.2 a paper summarising changes made to the recurring charges cost model since the December 2014 UCLL draft determination prepared by TERA;

74.3 a methodology paper for the non-recurring charges cost model prepared by TERA;

[58] Section 98 of the Commerce Act 1986 applies under section 15(f) of the Telecommunications Act 2001.

74.4 a paper reviewing submissions on the December 2014 UBA draft determination paper prepared by TERA;

74.5 a paper reviewing the Analysis Mason Model prepared by TERA;

74.6 a paper responding to submissions on the corridor cost analysis, prepared by Beca;

74.7 a report on the corridor cost analysis new rates and general recommendations prepared by Beca;

74.8 a paper outlining the corridor cost analysis of trenching and ducting rates in NZ prepared by Beca;

74.9 a paper prepared by Professor Ingo Vogelsang responding to comments on his 25 November 2014 paper, "current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand";

74.10 a paper on potential welfare gains and losses from an uplift to copper process prepared by Professor Carlo Cambini;

74.11 a paper prepared by Professor Ian Dobbs commenting on the application of the Dobbs 2011 model;

74.12 a paper providing advice in response to submissions regarding price trends prepared by NZIER; and

74.13 a model outlining historical series and data trends prepared by NZIER.

75. A separate paper explaining how we have calculated the WACC for the UCLL and UBA services has been published alongside this draft determination. Attached to this paper we have also published papers prepared by our expert consultants, including:

75.1 a second review of submissions on the WACC for UCLL/UBA prepared by Oxera;

75.2 a paper outlining whether a WACC uplift is appropriate for UCLL and UBA prepared by Oxera; and

75.3 a paper reviewing Oxera's report outlining whether a WACC uplift is appropriate for UCLL and UBA prepared by Professor Ingo Vogelsang.

Next steps

76. Our indicative dates for the UCLL FPP process are set out below:

Next steps	Date
Submissions	Thursday 13 August 2015
Cross submissions	Thursday 24 September 2015
Final pricing review determination	December 2015

77. As mentioned above, at this stage we are not proposing to hold a conference between this further draft determination and the final pricing review determination. However, as explained above, we will continue to follow the process with an open mind and will make adjustments to our process (including the need for another conference) if new issues cause us to revisit our decisions in the draft determinations, including modelling choices.

We are interested in your views

78. We would like to know your views on our further draft decisions in this further draft determination paper. By providing your views, you will help us finalise the approach we take to our TSLRIC cost modelling exercise for the UCLL and SLU services.

79. Submissions are due by 5pm on 13 August 2015.

80. Cross submissions are due by 5pm on 24 September 2015.

81. Extensions of time for submissions or cross submissions may be granted on a case-by-case basis if requested by parties in advance and accompanied by a proper explanation from the relevant chief executive.

82. Please address any submissions to: Tricia Jennings (Project Manager, Regulation Branch), c/o telco@comcom.govt.nz.

83. All submissions must be provided electronically in a format suitable for word processing. We intend to publish all submissions on our website. If you would like the published electronic copy to be "locked" then we ask that you provide multiple versions of your submissions. At least one version should be provided in a file format suitable for word processing, rather than a locked PDF file format.

Preserving the confidentiality of your submission

Submitters that are parties under the section 100 orders

84. When seeking protection for information contained in submissions as restricted information (RI) or confidential information (CI), or where submissions contain any protected information (RI or CI) under the section 100 orders, parties under the orders must comply with the processes set out in the orders.

Submitters that are not parties under the section 100 orders

85. While we recognise that there may be cases where you wish to provide information in confidence, we encourage full disclosure of submissions so that all information can be tested in an open and transparent manner. We offer the following guidance where you wish to provide information in confidence:

85.1 confidential information in submissions should be clearly marked;

85.2 both confidential and public versions submission should be provided; and

85.3 the responsibility for ensuring that confidential information is not included in a public version rests on the party providing the submission.

Chapter 1: Our framework for carrying out the UCLL pricing review determination

86. This Chapter outlines the regulatory framework under which we are setting a TSLRIC price for the UCLL service. In this Chapter we address:

    86.1 the legal requirements, including the Act's definition of TSLRIC;

    86.2 the TSLRIC objectives/outcomes to which we will have regard to when exercising our judgement and the role of section 18;

    86.3 our conceptual economic framework for TSLRIC, which follows the conventional approach in implementing TSLRIC, and the key characteristics of the hypothetical efficient operator and the hypothetical efficient operator environment;

    86.4 the concept of a MEA;

    86.5 other relevant considerations;

    86.6 additional legal requirements under the Act; and

    86.7 our views in relation to the *Vodafone TSO* case.[59]

We must determine a price in accordance with TSLRIC

Introduction to TSLRIC

87. In this pricing review determination we must apply the FPP. More specifically, section 49(a) of the Act requires that:

    > The draft pricing review determination must include—
    >
    > (a) the price payable for the designated access service, which, in the opinion of the Commission, is determined in accordance with—
    >
    > (i) the applicable final pricing principle (as affected, if at all, by clause 2 or clause 3 of Schedule 1);[60]

88. The Act requires us to form our own opinion of what is "in accordance with" the FPP.

89. The FPP for the UCLL service is TSLRIC.[61]

[59] *Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138, [2012] 3 NZLR 153.

[60] For our final determination, Telecommunications Act 2001, s 52(a) contains the same requirement. The provision also mentions "any regulations that relate to the applicable final pricing principle or, if there are no regulations, any requirements of the Commission". There are no such regulations and no requirements of the Commission other than those set in this determination. S 5 of the Telecommunications Act 2001 defines the term "applicable final pricing principle, in relation to a designated access service" as "the final pricing principle described in subpart 1 of Part 2 of Schedule 1 as the final pricing principle for the designated access service".

90. TSLRIC is an abbreviation for an economic concept: “total service long run incremental costs”. The Act provides us with a particular definition of “TSLRIC”:

> 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.

91. The Court of Appeal recently commented, in Chorus’ challenge of our IPP determination for the UBA service, that:[62]

> The TSLRIC model provides an estimate of the costs of an efficient access provider over a sufficient period of time (long run), on a “forward-looking” basis (reflecting the notional costs to an operator if it built a new network) rather than of Chorus’s actual costs.

92. We set out below the elements of the TSLRIC definition in the Act. As outlined in the December 2013 UCLL Process and Issues paper and in the December 2014 UCLL and UBA draft determination papers,[63,64] the definition of TSLRIC in the Act is broad and provides only limited practical guidance on the various choices that need to be made when undertaking a cost modelling exercise.

93. Therefore, in addition to the words in the Act, we are also informed by the conceptual economic underpinnings of the TSLRIC concept. As we also discuss in more detail below, the conventional economic framework for implementing TSLRIC is to postulate a hypothetical efficient operator building and operating an entirely new network using modern assets to provide the relevant regulated services. The hypothetical network is built from the ground up, and is not constrained by the legacy choices made regarding the existing network that provides the regulated services.

94. In broad terms, and for the reasons explained below, our approach to determining a price in accordance with TSLRIC for the UCLL service is to estimate the replacement capital cost of the network built using modern equivalent assets, to annualise this cost and add operating costs and an allocation of common costs. We then divide by demand and then divide by 12 to determine a monthly TSLRIC-based price per unit of demand. We elaborate on this approach in more detail in Chapter 2.

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[61] Telecommunications Act 2001, Schedule 1, Part 2, Subpart 1.

[62] *Chorus v Commerce Commission* [2014] NZCA 440 at [30].

[63] Commerce Commission “Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle” (6 December 2013), paragraph [56].

[64] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [70]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [70].

The Act’s definition of TSLRIC contains several elements

95. The Act’s definition of TSLRIC contains several elements which we have considered when developing our framework for determining a TSLRIC price. These elements are:

    95.1 forward-looking costs;

    95.2 over the long run;

    95.3 of the total quantity of the facilities and functions;

    95.4 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

    95.5 a reasonable allocation of forward-looking common costs.

96. Many of these terms in the Act’s definition are terms of economic theory, and our discussion below draws on an understanding of how these terms are defined in economics.

97. We discuss each of those elements further below.

Forward-looking costs

98. The Act does not define forward-looking costs.[65]

99. In 2002, we defined forward-looking costs as:[66]

> … costs that will be incurred in the future in providing the service. This involves estimating costs on the basis of current and future prices of inputs and given the availability of modern technologies and assets. The aim is to estimate the cost of providing the services in the future rather than the past.

100. In the December 2013 UCLL Process and Issues paper, we defined the concept of forward-looking costs as follows:[67]

    100.1 Forward-looking costs reflect the costs that a network operator would incur if it built a new network today using assets collectively referred to as the modern equivalent asset, which we discuss further below. The costs of these

65 We note that the TSLRIC acronym (total service long-run incremental costs) does not specifically refer to “forward-looking” costs. As we discuss later, forward-looking costs are typically considered to be an implicit component of the economic interpretation of TSLRIC. However, the Act does not leave this implicit, but rather explicitly identifies the concept of forward-looking costs. We also considered forward-looking cost models for the UCLL and UBA IPPs, based on the definition for the IPP in Schedule 1 of the Act.

66 Commerce Commission "Application of a TSLRIC Pricing Methodology - Discussion Paper” (2 July 2002), paragraph [32].

67 Commerce Commission “Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle” (6 December 2013), paragraph [68].

assets are the costs of currently available equipment as opposed to the costs of older equipment that may actually still be in use.

101. We consider that forward-looking costs reflect the current and ongoing future costs of providing the service. Historic costs that have already been incurred, and the accounting costs that are recorded in a business' financial accounts, are not necessarily the same as forward-looking costs (although they may be informative in some circumstances). Businesses and households make decisions (eg, regarding pricing, output, entry, investment, and consumption) based on present and future costs and benefits.

102. The requirement to base our price on forward-looking costs is a consideration in a range of our decisions. It is a key factor leading us to model the costs of a MEA, as we focus on what is a modern equivalent asset that a hypothetical operator would build today, and we are not limited by historical technology choices.

Over the long run

103. In the December 2014 UCLL and UBA draft determination papers we defined the "long run" to mean that costs are to be considered over a sufficient time horizon such that the service provider can optimise the way the service is delivered.[68] We noted that, over this timeframe, all factors of production including capital equipment are variable in response to changing demand.

104. This is consistent with how the concept of the long run is considered in economic theory. Economists define the long run as the period of time sufficiently long enough such that all costs are considered variable in response to changes in demand.[69] The Australian Competition & Consumer Commission (ACCC) has noted that this is a time period in which "all necessary investments must be replaced".[70] Similarly, Baumol refers to "the very long run" as "a period so long that all of the firm's present contracts will have run out, its present plant and equipment will have been worn out or rendered obsolete and will therefore need replacement, etc".[71]

Total service, incremental costs

105. The Act refers to costs that are "directly attributable to, or reasonably identifiable as incremental to, the service". Incremental costs are the costs that are additional or variable to an additional increment of output produced by a business. Determining whether or not costs are incremental requires consideration of the extent of the relevant increment of output, and also the timeframe over which costs are considered to be variable.

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68 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [79]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [79].

69 See, for example, Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [38].

70 ACCC "Access Pricing Principles – Telecommunications: a guide" July 1997, p.38.

71 William Baumol, *Economic Theory and Operations Analysis*, Fourth edition, Prentice Hall, New Jersey, 1977, p.290.

106. In regards to the relevant increment, TSLRIC refers to the “total service”, or in the words of the Act, the “total quantity of the facilities and functions”. The “total quantity of facilities and functions” refers to the total inputs required to supply the total quantity of the service by the network operator.[72] The total quantity includes the quantity supplied to the various access seekers and the quantity the network operator supplies to itself. This means that the TSLRIC is different from the incremental cost the network operator incurs in supplying the last unit of the service, or the incremental cost of providing the service to one particular access seeker.[73]

107. In the long run, where all costs are variable, incremental costs can also be considered as the avoidable costs, ie, the costs that would be avoided by not providing the service.

108. The Act’s definition of TSLRIC also requires that “the service provider's provision of other telecommunications services” should be taken into account to determine what costs are directly attributable to, or reasonably identifiable as incremental to, the service we model. This leads us to assume that the service provider that we use for cost modelling will provide other telecommunications services, in addition to the UCLL service for which we are modelling the TSLRIC cost. This affects how we identify incremental costs, and how we allocate shared costs and common costs (discussed under the next heading below).

109. As discussed in more detail below, we use the concept of a hypothetical efficient operator to model the TSLRIC cost. In order to determine what other telecommunications services that network operator would offer, we have chosen to look to the mix of services that Chorus provides. Accordingly, we assume that a hypothetical efficient operator would use its network infrastructure assets (eg, trenches and ducts) to provide other telecommunications services, such as leased line services with dedicated capacity for commercial end-users, High Speed Network Service (HSNS) and mobile site backhaul.

110. In addition to costs that are directly attributable to the service, the definition of TSLRIC refers to an allocation of forward-looking common costs, which are discussed next.

Reasonable allocation of forward-looking common costs

111. The Act’s definition of TSLRIC covers both:

111.1 incremental costs (as described in paragraph (a) of the definition and as described above); and

111.2 a reasonable allocation of forward-looking common costs (paragraph (b) of the definition).

[72] Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" (9 July 2014), paragraph [96.1].

[73] Commerce Commission “Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle” (6 December 2013), paragraph [65].

112. In this section we explain the requirements to be met in allocating forward-looking common costs. The details of the approach we have taken to allocating costs are discussed later in this further draft determination. We use the following terminology when talking about forward-looking common costs:[74]

    112.1 We generally use the term "common costs" to refer to costs not directly attributable to any individual service or sub-group of services; they are attributed to all services. An example is corporate overheads.

    112.2 We generally use the term "shared costs" to refer to costs not directly attributable to any individual service, but that can be attributed to a subgroup of services (rather than to all services). An example is the cost of an active cabinet, as not all services will use the active cabinet.

113. The Act also provides a definition of forward-looking common costs:

> **forward-looking common costs—**
>
> (a) means those costs efficiently incurred by the service provider in providing the service that are not directly attributable to providing an additional unit to that service; but
>
> (b) does not include any costs incurred by the service provider in relation to a TSO instrument

114. Accordingly, under limb (a) we must include a reasonable allocation of costs:

    114.1 Efficiently incurred; but

    114.2 Not directly attributable to providing an additional unit to that service.

115. First, we are only required to allocate common costs that would be efficiently incurred by the service provider. This means we will allocate the likely common costs associated with the hypothetical new network that a hypothetical efficient operator would build. As noted above, this includes the operator providing a mix of other telecommunications services using its infrastructure. It is open to us to look to Chorus' actual network and actual costs to guide us in assessing the likely common costs efficiently incurred by the hypothetical efficient operator, and in a number of instances we do.

116. However, we are not required to set a price based on Chorus' actual costs (though we discuss clause 4B below in this Chapter 1).

117. In allocating the shared costs of the hypothetical network, we will consider what other services the hypothetical efficient operator would provide. These shared costs include the cost of network infrastructure assets used for multiple services.

118. Second, we need to identify costs that are not directly attributable to providing an additional unit to that service. Those costs are the "forward-looking common costs", relevant to paragraph (b) of the definition of TSLRIC. Forward-looking costs that are

[74] Commerce Commission "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" (6 December 2013), paragraph [69].

directly attributable to, or reasonably identifiable as incremental to, the service are included in paragraph (a) of the definition of TSLRIC. Together this covers all relevant forward-looking costs.

Costs incurred in relation to a TSO instrument

119. Limb (b) of the Act's definition of "forward-looking common costs" provides that they do not include "any costs incurred by the service provider in relation to a TSO instrument". We address this in more detail below when we discuss "additional legal requirements".

Objectives/outcomes from the application of TSLRIC and section 18 considerations

Potential TSLRIC objectives/outcomes

120. It is generally established in the international literature and regulatory practice of TSLRIC that there are a number of potential objectives or outcomes that setting a regulated price using TSLRIC can promote.

121. As stated above, the definition of TSLRIC in the Act is broad and provides only limited practical guidance on the various choices that need to be made when undertaking a cost modelling exercise. Also, many of the terms of the Act's definition of TSLRIC are terms of economic theory. Therefore, we consider it appropriate to understand how TSLRIC is applied based on the economic underpinnings of the TSLRIC concept. This includes considering the potential objectives/outcomes that a TSLRIC-based access price is typically said to promote.

122. In this further draft determination we have reconsidered the objectives/outcomes of TSLRIC to which we give weight, and the role that these objectives/outcomes play in our TSLRIC modelling. We start by considering a wide range of possible TSLRIC objectives/outcomes, and we proceed from that list to consider what objectives/outcomes are relevant to the particular factual New Zealand circumstances in which we set our TSLRIC-based price, and what role these objectives/outcomes may play in our modelling decisions.

123. We set out in Table 1 a number of the potential objectives or outcomes that a TSLRIC-based access price is typically said to promote. We also separately discuss predictability as a potential TSLRIC objective/outcome later in this section.

Table 1: Potential objectives/outcomes that a TSLRIC-based access price may promote

Potential TSLRIC objective/outcome	Description
Efficient investment (both by the service provider and by access seekers)	A TSLRIC-based price can support incentives for the service provider to efficiently invest in maintenance and expansion of its network. It can also provide efficient "build/buy" incentives for access seekers, in terms of buying the wholesale service from the service provider, or building an alternative bypass network.
Preventing monopoly pricing	TSLRIC-based prices limit the service provider's ability to set prices at the monopoly level.
Incentives to minimise costs	TSLRIC can provide incentives for the service provider to reduce its costs and improve its productivity.
Efficient entry in downstream (retail) markets	TSLRIC can provide incentives for entry such that only efficient access seekers can enter and compete with the service provider in downstream (retail) markets.
Efficient use of infrastructure	TSLRIC can support incentives for access seekers and end-users to use wholesale and retail services efficiently.
Efficient cost recovery	TSLRIC sets prices so as to allow the service provider to recover only costs efficiently incurred, including through providing a normal return on efficient investment.
Non-discrimination between the service provider and access seekers	TSLRIC can mitigate the potential for discriminatory pricing as between access seekers and the service provider.

124. A number of sources support these potential objectives/outcomes:

124.1 The objectives/outcomes identified in Table 1 are consistent with those identified as TSLRIC objectives by regulatory authorities in Europe – see

TERA's review of the objectives used by regulators across Europe in applying LRIC methodologies.[75]

124.2 In our December 2013 UCLL Process and Issues paper we referred to an ACCC paper published in 1997 which usefully sets out some of the possible objectives/outcomes of a TSLRIC-based access price, including promoting efficient entry and exit [76]; supporting incentives for efficient investment in, and use of, infrastructure; providing incentives for cost minimisation; allowing for efficient cost recovery; and mitigating non-discrimination.[77]

124.3 Professor Vogelsang has identified many of the objectives/outcomes of TSLRIC drawn from his review of the academic literature, which include: providing prices that are compatible with competitive markets, thereby preventing monopoly pricing; providing for efficient entry; providing for allocative (efficient use of infrastructure) and productive (cost minimisation) efficiency; and providing for dynamic efficiency with respect to efficient investment by the access provider, access seekers and alternative competitors.[78]

124.4 In its submission on behalf of Vodafone to the Ministry of Business, Innovation and Employment (MBIE) regarding the review of the Telecommunications Act, Network Strategies also identifies some of these objectives/outcomes of TSLRIC as: providing incentives for efficient entry and exit; efficient investment; allocative efficiency; and cost minimisation.[79]

The role of TSLRIC objectives/outcomes in our modelling decisions

125. In our December 2014 UCLL and UBA draft determination papers we expressed our preference to emphasise predictability and efficient investment as objectives of a TSLRIC-based price.[80] In this further draft determination we have reconsidered the objectives/outcomes of TSLRIC to which we give weight to, and the role that these objectives/outcomes play in our TSLRIC modelling.

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75 TERA Consultants "TSLRIC literature review on UBA and UCLL Costing approaches" June 2014, p. [7].

76 Commerce Commission "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" 6 December 2013, paragraph [58].

77 ACCC "Access Pricing Principles – Telecommunications, a guide" 1997, pp. [29-30].

78 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [45]. See also Ingo Vogelsang "What effect would different price point choices have on achieving the objectives mentioned in s18, the promotion of competition for the long-term benefit of end-users, the efficiencies in the sector, and incentives to innovate that exist for, and the risks faced by investors in new telecommunications services that involve significant capital investment and that offer capabilities not available from established services" 5 July 2013, paragraph [24].

79 Network Strategies "Review of the Telecommunications Act 2001: Key Issues" 13 September 2013, p. [24].

80 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [126]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [96].

126. As a starting point, we are open to considering any of the potential TSLRIC objectives/outcomes identified above in our modelling decisions.

127. However, we have found in practice that some of the objectives/outcomes noted in Table 1 are of limited relevance given the current New Zealand circumstances.

128. For example, an objective/outcome of non-discrimination is relevant when there is a vertically integrated service provider, as a service provider might otherwise favour its own downstream retail operations over those of its retail competitors. In the present circumstances, however, where Chorus is legally prohibited from operating in the downstream (retail) segment in which RSPs compete, non-discrimination is not a relevant consideration.[81] We note also that section 69XB of the Act sets out the requirements for undertakings by Chorus relating to supply of certain wholesale telecommunications services, which includes non-discrimination provisions. These factors limit the role played in our modelling decisions by a TSLRIC objective/outcome of non-discrimination.

129. Furthermore, we note that the TSLRIC objectives/outcomes are typically considered to be outcomes that arise from an appropriate application of TSLRIC based on the efficient costs incurred by a hypothetical operator building a new network. To this extent, our modelling decisions are driven more by applying TSLRIC in this manner (along with the other relevant considerations, including those specified in the Act), rather than focussing on the objectives/outcomes *per se*.

130. In summary, we have kept our minds open to all potential TSLRIC objectives/outcomes, but have found in practice that their greatest role has been a cross-check, by ensuring that any of our modelling decisions do not undermine these objectives/outcomes. That is, while our individual modelling decisions are not necessarily made in the context of attempting to achieve a particular TSLRIC objective or outcome, we can still consider whether there is anything in our individual or collective modelling decisions that undermines or is inconsistent with the achievement of these outcomes, where we consider this to be important.

Predictability

131. In our July 2014 Regulatory Framework and Modelling Approach paper we expressed a view that respecting reasonable investor expectations would give effect to the section 18 purpose statement, as doing so would help build predictability into regulation.[82]

132. Having regard to submissions on this issue, in our December 2014 UCLL and UBA draft determination papers we decided not to use reasonable investor expectations

[81] We note that there is a slight distinction here in respect of unbundling, where Chorus competes (through the provision of the UBA service) at a similar functional level to unbundlers.

[82] Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [86].

as an independent consideration.[83] However, we continued to give weight to providing for predictability in our implementation of TSLRIC, which we considered could be provided for by adopting what is considered an orthodox approach to TSLRIC internationally.[84]

133. Many submitters were critical of the approach in the December 2014 UCLL and UBA draft determination papers where we gave weight to an objective of predictability. The major criticisms were that:

133.1 we had placed disproportionate weight on or prioritised the objective of predictability in respect of our modelling decisions;[85]

133.2 there is no provision in the Act, or in terms of the proper application of section 18, for a predictability test in respect of our modelling decisions;[86] and

133.3 predictability as a concept is meaningless when we are undertaking our first determination of FPP prices for the UCLL and UBA services.[87] A related criticism is that what is currently orthodox (eg, in respect of asset re-use) in TSLRIC models may no longer be so when resetting FPP prices in 2020.[88]

134. In contrast, Chorus supported adopting predictability as an objective, and giving weight to this by implementing an orthodox approach to TSLRIC.[89] In addition, Chorus submitted in response to the criticisms set out above that:

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83 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [183]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [153].

84 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [126.1]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [96.1].

85 Spark "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [146]; Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [B2.7]; and Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [8.2].

86 Spark "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [157]; and Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [B2.14]

87 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [B2.12]; and WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service unbundled copper local loop services including the cost model and its reference documents" 19 March 2015, paragraph [38].

88 Spark "UBA and UCLL FPP pricing review draft decision" 20 March 2015, paragraph [63].

89 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 February 2015, paragraph [638].

134.1 there is nothing in our December 2014 UCLL and UBA draft determination papers that indicates predictability is an exclusive or predominant test, and we have taken account of a range of other matters;[90]

134.2 while predictability is not a concept that is found in section 18, we are entitled to elaborate on how the section 18 purpose can best be met;[91] and

134.3 a predictable application of TSLRIC is possible despite this being the first instance, because we have in fact previously considered the application of TSLRIC in New Zealand and there are also an extensive number of international regulatory decisions involving TSLRIC.[92]

135. In response to submissions, we have reconsidered the role of an objective of predictability in our decision-making framework. As explained further below, although we agree with submitters that we should be careful not to give predictability disproportionate weight, we remain of the view that regulatory predictability is a relevant consideration, when considered as part of best regulatory practice. Submitters appear to be supportive of regulatory predictability as a general concept when considered in this way.

136. Spark submits that a predictable regulatory framework is a “laudable objective” that we should strive for in New Zealand’s framework and processes;[93] Vodafone accepts regulatory predictability as a “desirable” regulatory objective;[94] and WIK refers to regulatory predictability as “highly important as an objective as good governance of regulation”.[95]

137. Moreover, we remain of the view that regulatory predictability is consistent with the section 18 purpose statement. Where there is regulatory uncertainty, there is the potential for firms’ incentives to invest and innovate to be undermined. As noted in our December 2014 UCLL and UBA draft determination papers, investment and innovation is generally beneficial to end-users.[96] Providing a predictable regulatory

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90 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 March 2015, paragraph [255].

91 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 March 2015, paragraph [249].

92 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 March 2015, paragraph [256] and [257].

93 Spark “UBA and UCLL FPP pricing review draft decision” 20 February 2015, paragraph [151].

94 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" 20 March 2015, paragraph [C5.2].

95 WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service unbundled copper local loop services including the cost model and its reference documents" 19 March 2015, paragraph [61].

96 Commerce Commission “Draft pricing review determination for Chorus’ unbundled copper local loop service” 2 December 2014, paragraph [131]; Commerce Commission “Draft pricing review determination for Chorus’ unbundled bitstream access service” 2 December 2014, paragraphs [101].

environment that supports firms' incentives to invest is therefore important for the promotion of competition in telecommunication markets for the long-term benefit of end-users, and we consider that this is consistent with the section 18 purpose statement.

138. In regards to the submissions that this is an improper application of section 18, or that there is no provision in the Act for a predictability test, we note that we are not seeking to re-interpret section 18 or apply it in a different way. Rather, we are of the view that regulatory predictability is a relevant consideration in the broad sense of best regulatory practice.

139. However, we agree with submitters that it should not be the only consideration or a consideration to which we give disproportionate weight. In other words, we overstated the relevance of predictability in the December 2014 UCLL draft determination. We now consider that there are a number of other factors that we have regard to in our decision-making framework (as set out in this Chapter), and regulatory predictability is just one of those considerations that we will have regard to. We are therefore of the view that regulatory predictability is one of a number of relevant considerations in our analysis which should then be considered in the round.

140. We also agree with submitters that regulatory predictability is best considered at a higher level,[97] in terms of best regulatory practice. We have found that predictability is not necessarily relevant across each individual modelling decision, and as Vodafone submit, it is hard to provide for predictability with such a large number of modelling decisions.[98] An assessment of the conventional approach to TSLRIC can be a useful starting point for certain modelling decisions, but it is not the only consideration.

Role of section 18 in setting a TSLRIC-based price

Our overall consideration is what promotes competition in telecommunications markets for the long-term benefit of end-users, and in doing so we consider section 18(2) and (2A)

141. Section 19 requires us to consider "the purpose set out in section 18" and make the determination that, in our view, best gives or is likely to give effect to that purpose. That purpose is found in section 18(1), which is:

> … to promote competition in telecommunications markets for the long-term benefit of end-users of telecommunications services within New Zealand by regulating, and providing for the regulation of, the supply of certain telecommunications services between service providers.

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97 See, for example, Spark "UBA and UCLL FPP pricing review draft decision" 20 March 2015, paragraph [61].

98 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" 20 March 2015, paragraph [C5.5].

142. Section 18(2) and (2A) identify particular matters that we are required to take into account when determining what promotes competition in telecommunication markets for the long-term benefit of end-users.

143. As the High Court observed, section 18(1) is the "dominant" provision in section 18, and that subsections (2) and (2A) "are specified for the purpose of assisting analysis under section 18(1)".[99] In this sense, subsections (2) and (2A) are not isolated considerations in their own right, rather they help us consider whether competition is promoted to the long-term benefit of end-users. In other words, all of the analysis around the relevant considerations which feed into section 18(1) should then be considered in the round and we will make a decision that we consider best promotes competition in telecommunication markets for the long-term benefit of end-users.

144. Section 18(2) requires us to consider the efficiencies that will result, or will be likely to result, from acts or omissions. We have treated "efficiencies" as referring to static and dynamic efficiencies.

145. Static efficiencies are allocative and productive efficiencies. By contrast, dynamic efficiencies are concerned with new and innovative products and services, or existing ones at better quality, which lead to greater consumer choices and benefits over the long-term.

146. Where there is a trade-off between static and dynamic efficiencies, we generally give greater weight to dynamic efficiencies. This is because of the emphasis in section 18(1) of promoting competition over the long-term. We took that approach in our IPP determination, which was noted by Kós J.[100] As discussed above, we consider efficiencies as part of considering what will result, or will be likely to result, in competition in telecommunication markets for the long-term benefit of end-users.

147. Section 18(2A) requires us to consider the "incentives to innovate that exist for, and the risks faced by, investors in new telecommunications services that involve significant capital investment and that offer capabilities not available from established services." A determination that undermines incentives to invest would deter future investment and so would likely undermine competition over the long-term.

The relationship between a TSLRIC-based price and section 18

148. In the context of the FPP, we determine a price in accordance with the Act's definition of TSLRIC. Section 18 does not operate so as to require a particular price for a particular service. Indeed, the Act has various different pricing principles, all of which must be taken as being consistent with the section 18 purpose statement.

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99 *Chorus v Commerce Commission* [2014] NZHC 690 at [34].

100 *Chorus v Commerce Commission* [2014] NZHC 690 at [34].

149. The Court of Appeal has confirmed that, as a general principle, we should read the specific requirements of the Act as being consistent with the section 18 purpose statement. It stated:[101]

> …it is reasonable to assume that Parliament will have settled on that particular definition because it is consistent with and implements the requirements of the statutory purpose.

150. In the context of the IPP determination, it also stated (footnotes omitted):[102]

> [44] It is also reasonable to assume, on the basis of the principle of statutory interpretation that the provisions of a statute are likely to be internally consistent, that the statutory definition of the UBA price reflects the requirements of s 18, including in particular subs (2A) which was enacted at the same time. In other words, the mandatory requirement for the Commission to carry out the "benchmarking" exercise for the IPP by reference to appropriate "comparable countries" is itself designed to implement the statutory purpose, not to contradict or undermine it.

151. Furthermore, there is a close link between the TSLRIC efficiency-based objectives, the objectives of section 18 and setting a price based on forward-looking efficient costs will generally promote competition.

152. Some submitters have agreed that a properly-applied TSRLIC approach is consistent with section 18 and noted that our primary focus should be a careful application of the TSLRIC methodology.[103]

153. Spark submitted that "s18 does not override the obligation to first focus on the technical task of determining and modelling the best estimate of efficient forward-looking costs when applying a TSLRIC methodology."[104] Similarly, Vodafone has submitted that "s 18 considerations cannot displace a proper analytical approach to determining TSLRIC." [105]

154. We note, however, that section 18 may provide guidance at a number of decision points during the TSLRIC cost modelling exercise. We explain further below how we consider section 18 throughout the cost modelling process and before making our overall price decision.

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101 *Chorus v Commerce Commission* [2014] NZCA 440 at [153].

102 *Chorus v Commerce Commission* [2014] NZCA 440.

103 See, for example, Spark "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [136]; Vodafone "Submission to the New Zealand Commerce Commission on Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Comments on Analysys-Mason TSLRIC Models" 20 February 2015, paragraph [B2.1].

104 Telecom "UCLL and UBA FPP: consultation on regulatory framework and modelling approach - Submission Commerce Commission" 6 August 2014, paragraphs [36] and [43].

105 Vodafone NZ "Submission to the New Zealand Commerce Commission - Comments on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, paragraph [D1.7]. Vodafone "Submission to the New Zealand Commerce Commission - Cross submission on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 20 August 2014, paragraph [B1.6]. See Vodafone "Comments on process and issues paper for the unbundled copper local loop (UCLL) final pricing principle" 14 February 2014, paragraphs [C2.12]-[C2.13].

How we apply section 18 to cost modelling decisions throughout the process

155. In the December 2014 UCLL and UBA draft determination papers we stated that we will consider section 18 throughout the process.[106] This relates in particular to considering the section 18 purpose statement in regards to each of the TSLRIC modelling choices we make throughout the process.

156. Submitters generally agreed that we should consider section 18 in regards to individual modelling choices. Spark states that "…where choices are required when implementing TSLRIC, [the Commission is required to] make choices that enable it to give best effect to the purpose set out in section 18".[107] At the conference, Chorus stated that section 18 is a mandatory requirement in respect of "all discretions that the Commission is exercising",[108] while Vodafone noted that section 18 applies "to a range of functions that [we] perform", including in setting a TSLRIC price.[109]

157. In contrast with these views, Wigley and Company submitted that we can apply section 18 to our modelling decisions only to resolve an "impasse" where no modelling choices lead to true TSLRIC.[110] Wigley and Company further stated at the conference that many modelling decisions can be determined "without regard to section 18".[111]

158. Section 19(c) requires that we make a determination that we consider best gives, or is likely to best give, effect to the section 18 purpose statement. In order to ensure that the determination as a whole best meets the section 18 purpose statement we remain of the view that we should consider section 18 throughout the process in respect of each individual modelling decision.

159. The section 18 purpose statement is therefore potentially relevant wherever the Commission has to exercise its discretion to come to an answer, and this applies in respect of modelling choices we make in our TSLRIC model.

160. We note, however, that the section 18 purpose statement may not necessarily be helpful in respect of each and every modelling decision (for example, regarding technical details or where certain approaches are prescribed by the Act). We agree with the earlier submissions of Spark and Vodafone that section 18 may not

106 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [202]; Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [172].

107 Spark "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [124].

108 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 34.

109 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 39.

110 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [5.13].

111 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p.34.

necessarily have a "discernible",[112] or "separately observable",[113] effect at every decision point during the modelling process.

161. Moreover, we find that, in practice, there do not appear to be any strong and unequivocal ways in which many of our individual modelling choices can promote competition in telecommunication markets for the long-term benefit of end-users.

162. Indeed, the predominant effect of individual modelling choices can generally be reduced to an impact on the resulting modelled price. Historically, the relative levels of the UCLL and UBA prices have been important in promoting unbundling competition. However, as we set out in more detail in Chapter 4 in respect of our relativity considerations, it is not clear in the present circumstances that promoting unbundling will necessarily promote competition in telecommunication markets for the long-term benefit of end-users.

163. Moreover, in the present circumstances it is also not clear how a higher or lower price from a particular modelling decision can *per se* promote competition in telecommunication markets for the long-term benefit of end-users separately from the overall price level.

164. Accordingly, we consider that the relationship between the price level and section 18 and the analysis of the risks of under- or over-estimating the TSLRIC price can be addressed in light of the cumulative effect of all our modelling choices, and that it is therefore desirable to undertake this analysis after all modelling decisions have been made and we have determined our central estimate of the TSLRIC-based price.

165. We discussed this issue with parties at the conference, and some parties noted that there will be individual modelling choices in which section 18 may not be relevant. Chorus stated that there may be modelling decisions in which section 18 may not “bite directly”,[114] and Vodafone stated that section 18 may not have a role where judgements can be made on the best available evidence.[115]

166. Overall we are of the view that we should consider section 18 throughout in respect of our individual modelling decisions, although it may not necessarily be particularly instructive in respect of certain modelling choices. Even where it is not necessarily instructive, section 18 is a mandatory consideration and we consider it is best taken

112 Telecom "UCLL and UBA FPP: consultation on regulatory framework and modelling approach - Submission Commerce Commission " 6 August 2014, paragraph [46].

113 Vodafone NZ "Submission to the New Zealand Commerce Commission - Comments on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, paragraph [D1.7]. Vodafone "Submission to the New Zealand Commerce Commission - Cross submission on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 20 August 2014, paragraph [B1.6]. See also Vodafone "Comments on process and issues paper for the unbundled copper local loop (UCLL) final pricing principle" 14 February 2014, paragraphs [C2.12]-[C2.13].

114 Commerce Commission “UBA and UCLL pricing review determination conference transcript” 15-17 April 2015, p. 35.

115 Commerce Commission “UBA and UCLL pricing review determination conference transcript” 15-17 April 2015, p. 41.

into account by considering it as a cross-check, by ensuring that our modelling decisions and overall approach promotes that purpose.

How we consider section 18 purpose statement before making our overall price decision

167. Our modelling choices taken together determine our central estimate of TSLRIC, which represents our best estimate of the forward-looking efficient costs of supplying the UCLL service. However, because there is uncertainty in this estimate, and it could conceptually lie within a plausible range, we can consider the costs of an error in our central TSLRIC estimate. To the extent these costs are asymmetric, then we can consider whether we can better meet the section 18 purpose statement by considering an increase or decrease from the central TSLRIC estimate.[116] Because such an approach is based on the costs of erring from the best estimate of the forward-looking efficient costs of supplying the UCLL service, it is desirable to undertake this analysis once all our modelling decisions have been made, rather than in respect of each individual modelling decision.

168. How we consider section 18 and exercise our judgement in making our overall price decision is further discussed in Chapter 4.

Our conceptual economic framework for TSLRIC and the hypothetical efficient operator

169. As mentioned above, the Act's definition of TSLRIC is short and includes economic terms. In order to understand what the definition means or how TSLRIC should be applied we look to the words in the Act and are also informed by the conceptual economic underpinnings of the TSLRIC concept.

170. We note that the Act's definition of TSLRIC refers to the costs of the "service provider" and not the "access provider". The term "access provider" is used in the Act's descriptions of the regulated services, where for many services Chorus is identified as the "access provider". The use of "service provider" and not "access provider" in the definition of TSLRIC reinforces the view that we are not required to model Chorus' actual costs.

171. In our December 2014 UCLL and UBA draft determination papers we set out briefly our conceptual economic framework for TSLRIC, as that of a hypothetical efficient operator operating a newly built network providing the relevant regulated services, and discussed some of the implications of this.[117]

172. Submitters have generally supported, in broad terms, the conceptual basis for implementing TSLRIC by postulating a hypothetically efficient operator building a notional network.

[116] Also, as discussed in more detail in Chapter 4, if the evidence demonstrates that incentivising migration to fibre (by way of moving to a different point within a plausible range) would promote competition in telecommunication markets for the long-term benefits of end-users of telecommunications services, then, it is within our discretion to make this adjustment.

[117] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [149]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [119].

173. For example, Chorus submits that the hypothetical efficient operator concept is a tool used to determine the TSLRIC-based price of providing the regulated service;[118] Spark supports the hypothetical efficient operator approach as pointing to a solid foundation for the TSLRIC model;[119] Vodafone submits that "there is general agreement that TSLRIC must reflect the price of a hypothetically efficient operator (HEO) deploying a network using modern equivalent assets (MEA)" [120]; and Wigley and Company submits that TSLRIC is about determining the costs of a hypothetical efficient operator and "the whole idea is not to model the incumbent's network".[121]

174. Where submitters appear to differ in their views is in how the hypothetical efficient operator concept is characterised for purpose of the TSLRIC modelling. For example, Chorus characterised the hypothetical operator as a replacement for Chorus without access to Chorus's assets.[122] In contrast, Network Strategies has characterised the hypothetical operator as an operator that would seek to re-use assets that were available.[123]

175. In the following sections we provide more detail on the conceptual economic framework for TSLRIC, the hypothetical efficient operator and its characteristics, and the implications of this in terms of our TSLRIC modelling exercise.

The conventional approach to TSLRIC

176. TSLRIC is a methodology that bases wholesale prices on the economic costs that would be incurred in providing the service. Economic costs are generally considered to be the forward-looking costs that are incremental to the service in question and efficiently incurred over the long run.[124] We have discussed above the concepts of forward-looking, long-run, and incremental costs. In addition to these concepts, we noted also that economic costs as measured under TSLRIC are only those that are efficiently incurred. Costs that are efficiently incurred reflect those of least cost technologies and processes, subject to meeting customer preferences, including maintaining scope and quality for the relevant services. As Professor Vogelsang

118 Chorus "Submission for Chorus in response to Draft Ricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 February 2015, paragraphs [101-102].

119 Spark "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [36].

120 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, at executive summary "ii)".

121 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraphs [5.18e] and [2.31].

122 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 66.

123 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 69.

124 Baumol, Ordover and Willig (1996, p.3) state that "economic costs are long-run costs that reflect forward-looking efficient investment, including a return on capital consistent with competitive capital markets". Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig (1996), Attachment to Comments filed by AT&T on May 14, 1996 in FCC Docket 96-98.

notes, this implies that "outdated technologies and inefficiently incurred costs like redundant manpower are not reflected".[125]

177. The conventional approach to implementing the concept of TSLRIC, so as to estimate forward-looking, long-run, efficiently incurred, incremental costs, is to hypothesise an efficient operator building and operating an entirely new network using modern assets to provide the relevant regulated services. The hypothetical network is built from scratch, as if the hypothetical efficient operator is building on a blank/clean slate, and is not constrained by legacy choices made regarding, for example, the design of the network, the nature of assets or the mix of technology employed. This involves the assumption that all assets within the legacy network no longer exist, and modern and efficient technology is used to build and operate the hypothetical new network.

178. By assuming a hypothetical efficient operator that replaces the entirety of the network as if building from scratch, TSLRIC takes into account the concept of "long-run" costs. Mayo (2003) makes this point in respect of a variant of TSLRIC, total element long-run incremental cost (TELRIC),[126] where he states that "…as a long run model, TELRIC-based cost calculations appropriately consider all plant and equipment to be malleable, and are therefore constructed from the ground up".[127]

179. Similarly Professor Vogelsang has stated that "[t]he conventional approach to TSLRIC measurement has been to interpret "long-term" to mean that all costs are variable so that the costs measured are those of a hypothetical firm that starts from scratch".[128]

180. The conceptual paradigm of a hypothetically efficient operator building a new network on a clean slate using modern efficient technology therefore captures the efficient incremental costs that will be incurred over the long-run in providing the regulated service. And to the extent that these costs are assessed based on present and ongoing future costs, then it will also account for the forward-looking concept of TSLRIC.

125 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [39].

126 TELRIC is a variant of TSLRIC that was applied in the United States by the Federal Communications Commission. There is no difference in TELRIC and TSLRIC in respect of their treatment of the hypothetical network build; rather the difference relates only to the extent of the increment considered. Doane, Sibley and Williams (1999) have noted that "[t]he concept behind TELRIC is the same as that of TSLRIC but is specific to a particular network element." (Michael J. Doane, David S. Sibley and Michael A. Williams (1999) "Having Your Cake – How to Preserve Universal-Service Cross Subsidies While Facilitating Competitive Entry" *Yale Journal on Regulation*, 16, 311-326, footnote 12 at 313).

127 John W. Mayo (2003) "Efficient Forward-Looking Telecommunications Networks as a Foundation for TELRIC" in *Pricing Based on Economic Cost: The Role and Mechanics of TELRIC*, a collection of essays published on the FCC website, available at http://apps.fcc.gov/ecfs/document/view;jsessionid=bxchRlNG6hyvDBpyF7cN20J5jv2C5G65Wvs6vV4YgTpvWGQrptYQ!-1694890999!-477673473?id=6515382451, p.1.13.

128 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [86].

181. The economics literature also supports the proposition that the conventional TSLRIC concept (and its variant TELRIC) is implemented based on the assumption of a hypothetical network being built from scratch using modern efficient technology. For example:[129]

181.1 Noam states that "TSLRIC is defined as the total forward-looking cost of a hypothetical, efficient system built from scratch, using the most efficient modern technology";[130]

181.2 Kahn, in discussing TELRIC, describes it as "the costs of a hypothetical, most efficient new entrant, constructing an entire set of facilities as though writing on a blank slate";[131]

181.3 Ergas refers to "the "thought experiment" underlying TSLRIC as "the hypothetical builder of a new, wholesale only, network";[132]

181.4 Bauer refers to TELRIC as "a forward-looking methodology to generate a benchmark based on the assumption that an efficient, modern network (rather than the legacy network) is in place".[133]

182. Regulators who have applied the conventional TSLRIC methodology have also taken a similar view in respect of the hypothetical paradigm underlying the concept. For example:

182.1 The ACCC applied a TSLRIC methodology to determine wholesale prices for unbundled local loop services up until 2011 when it was replaced with a building blocks methodology. In respect of the TSLRIC methodology applied, the ACCC has stated:[134]

> "…each time an access price is determined, the existing sunk investment (in this case the [copper access network]) is revalued on the basis of a hypothetical situation **where a brand new network is instantaneously constructed**, and replicates the existing network's service potential, **but uses best-in-use technology** based on forecast demand. The 'cost' of building this hypothetical replacement network is therefore the 'asset base' from which access prices are determined".

129 The references to the economics literature below are intended to illustrate what the authors consider to be the conceptual framework underlying TSLRIC/TELRIC. The citations should not be taken to indicate that we either agree or disagree with the remaining arguments raised in the papers cited.

130 Eli M. Noam (2001), *Interconnecting the Network of Networks*, Massachusetts Institute of Technology, Massachusetts, p.95.

131 Alfred E. Kahn (2001), *Whom the Gods Would Destroy or How Not to Deregulate*, AEI-Brookings Joint Center for Regulatory Studies, Washington D.C., p.4.

132 Henry Ergas (2009) "Time Consistency in Regulatory Price Setting: An Australian Case Study" *Review of Network Economics*, 8(2), 153-163, p.160.

133 Johannes M. Bauer (2005) "Unbundling Policy in the United States: Players, Outcomes and Effects" *Communications & Strategies*, 57, 59-82, p.65.

134 ACCC (2009) "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking" Final decision, August, p.54, emphasis added.

182.2 The Irish Commission for Communications Regulations (ComReg) sets wholesale prices for unbundled local loop services using a bottom-up long-run average incremental cost (BU-LRAIC) model. Such a model follows the same general principles used for TSLRIC/TELRIC modelling. ComReg has stated that "[a] principal characteristic of a model of this nature is that it allows for the cost of a newly designed modern efficient network"[135] and that "ComReg believes that the BU-LRAIC methodology should reflect assets of a new network".[136]

183. Along similar lines, in a 2013 submission on behalf of Vodafone to MBIE, Network Strategies summarised standard practice in respect of TSLRIC modelling:[137]

> "Regulators typically develop a bottom-up economic/engineering cost model to estimate TSLRIC prices. This involves estimating the cost of replicating the functionality of the network if it had to be built from scratch today. Current market or replacement cost is applied, the network is dimensioned to meet current (and forecast) demand and the number and type of modern equivalent assets (MEA) that need to be costed are estimated."

Implications of the conventional approach to TSLRIC

184. In our December 2014 UCLL and UBA draft determination papers we noted that the conventional approach to TSLRIC "is not intended to be a business plan for building and operating a high-speed nationwide network replacement accounting for resource pressures".[138] At the conference, Chorus referred to the concept of a hypothetical efficient operator as a "tool", and "not an end [unto] itself".[139] We agree with Chorus, and consider that we do not need to specify in too much detail the exact circumstances in which our hypothetical efficient operator will build a replacement network, when the intent of this paradigm is simply to help us identify forward-looking long-run incremental costs. Nonetheless, there are some elements of the hypothetical efficient operator thought experiment that do require some consideration, as they help us understand the nature of the costs that will be incurred. We set out these considerations in this section.

185. We consider that the hypothetical operator is efficient. Efficiency here has various dimensions. One is in respect of the technology choice, where the hypothetical operator would choose a network technology that is most efficient in respect of factors including (but not limited to) cost, lifetime, customer preferences, and technological performance. Another aspect of efficiency relates to network deployment, where the hypothetical operator could optimise its new network

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135 Comreg (2010) "Response to Consultation Documents No. 09/39 and 09/62" Decision No. 01/10, 9 February, paragraph 1.11.

136 *Ibid*, paragraph 4.177.

137 Network Strategies (2013) "Final report for Vodafone New Zealand: Review of the Telecommunications Act 2001" 13 September, p. 24.

138 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [156]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [126].

139 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 66.

deployment to efficiently meet expected demand. Efficiency also reflects costs that are efficiently incurred, as discussed above.

186. The economics literature on TSLRIC/TELRIC referred to above considers only the telecommunications network under consideration as that which is built from scratch. There is nothing in the literature to suggest that infrastructure of other networks (eg, mobile networks, electricity networks) is also being built; rather, it appears that such infrastructure is assumed to remain in place. Consideration should be given as to whether the hypothetical efficient operator could share certain assets (eg, mobile towers, underground or overhead infrastructure) with other networks that already exist.

187. Similarly other real-world constraints are also assumed to exist in the hypothetical world in which the network is built. We note, however, that in a modelling environment it is typically the case that not all aspects of the real world can be reflected. For example, in the present circumstances we make a simplifying assumption that the hypothetical operator has sufficient access to land, labour, capital and other resources to construct and operate its network.

188. A further implication of the use of the hypothetical efficient operator paradigm as an approach to implementing TSLRIC is that the hypothetical efficient operator is not constrained by the legacy decisions of the incumbent in respect of, for example, network technology, network design, the nature of the assets and cost structures. The characteristics and costs of the incumbent are therefore not a necessary consideration in regards to the network that is built and operated.

189. Baumol, Ordover and Willig state that "proper TSLRIC estimates do not simply accept the architecture, sizing, technology, or operating decisions of the ILECs [incumbent] as bases for calculating TSLRIC".[140] The logic is that the network built by the incumbent, and the costs that it incurs, are not necessarily efficient, and to take these as given would be inconsistent with the TSLRIC approach of reflecting efficient forward-looking costs.

190. Having said that, real-world information may be used to inform our assessment of constraints a hypothetical efficient operator would be likely to face and decisions it would be likely to take. For example, there may be circumstances in which decisions made by Chorus in the real world, to the extent that these are considered to be efficient, may provide an indicator as to the hypothetical efficient operator's likely response to the same issues.

140 "Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig (1996), Attachment to Comments filed by AT&T on May 14, 1996 in FCC Docket 96-98, at p.9. See also, for example, Gregory L. Rosston and Roger G. Noll (2002) "The Economics of the Supreme Court's Decision on Forward Looking Costs" *Review of Economics*, 1(2), 1-13, at p.3, who state that "According to the TELRIC method, the price of a[n] [unbundled network element] should be based on the cost of building an efficient network using the best available technology, rather than the actual cost of the incumbent's network (or any other network that was built in the past)".

191. We consider also that, to the extent that it is relevant in respect of our modelling choices, the regulatory and legislative environment facing the hypothetical efficient operator should generally reflect real-world circumstances.

192. For instance, we consider that the Resource Management Act 1991, as amended ("the RMA"), is a relevant consideration for this further draft determination. In order to be able to determine what impact ,[141] in terms of cost, the RMA would have on the hypothetical efficient operator's network deployment we have identified the areas where we consider such implications would arise, these being trenching and aerial deployment. As explained further in the relevant attachments, based on the assumptions that RMA consent would be sought where relevant and granted, we have made our best estimate of the costs associated with obtaining the relevant consents.

European Commission "move away" from the conventional approach to TSLRIC

193. We have noted that the implementation of TSLRIC using a hypothetical operator building an entirely new network with modern assets is the *conventional* approach. More recently, however, the application of TSLRIC by some regulators have moved away from that approach, with the European Commission (EC) recommending a methodology to be applied by European regulators which "should not assume the construction of an entirely new civil infrastructure network for deploying an NGA [next generation access] network".[142] Rather, the EC approach is to assume that certain legacy civil engineering assets can be re-used by the hypothetical operator in its construction of a replacement network.

194. The EC's rationale for moving away from the conventional approach to TSLRIC appears to be twofold:

    194.1 The EC's recommended approach is regarded as sending the appropriate pricing signals for efficient market entry, reflecting a competitive process in the European context in which it would be unlikely that civil engineering infrastructure would be replicated by a new entrant;[143] and

[141] The RMA requires local Councils to ensure that environmental impacts are managed sustainably. In order to comply with this obligation, each local Council has a set of rules, which typically differ to some degree as the rules relate specifically to the relevant local areas and the costs associated with obtaining consents or planning permission also vary.

[142] European Commission "Commission recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment" 11 September 2013, paragraph [32].

[143] European Commission "Commission staff working document – Impact assessment accompanying the document Commission recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment" 11 September 2013, p. 43 and 82.

194.2 The approach is regarded as avoiding the risk of over-recovery of costs of re-useable legacy civil infrastructure.[144]

195. As a preliminary point, we note that the TSLRIC methodology is not prescribed by European law.[145] While the Access Directive requires national regulatory authorities to consider imposing price control where there is a lack of effective competition,[146] it does not mandate a particular pricing methodology. In making its recommendation, the EC had discretion in designing an appropriate methodology without being constrained by conventional economic underpinnings of TSLRIC. By contrast, we are required to apply a TSLRIC methodology.

196. In respect of the first rationale, the EC's approach is based on its view that the competitive process will likely reflect bypass of the incumbents' copper networks in the European Union through the roll-out of a next generation network (eg, fibre) with re-use of the incumbent's civil engineering assets. We consider, however, that we should take into account the circumstances in New Zealand, and the EC situation is distinguishable in New Zealand in two important ways:

196.1 The current competitive situation in New Zealand is characterised by fibre deployment through the subsidised ultra-fast broadband (UFB) roll-out. In some areas, Chorus' copper network also remains subject to competitive UFB roll-outs by LFCs. Accordingly, we consider that the competitive process in New Zealand is different from that used to justify a movement away from the conventional TSLRIC concept by the EC; and

196.2 The European Union has a more extensive regulatory regime for regulated access to certain civil engineering assets (eg, ducts, trenches and poles) than does New Zealand. Directive 2014/61/EU of the European Parliament and Council of the European Union directs member states to ensure network operators can offer undertakings to provide access to physical infrastructure for deploying high-speed electronic communication networks.[147] In addition, the EC has stated that "[a]ccess to civil engineering infrastructure is crucial for the deployment of parallel fibre networks" and recommended that "[w]here duct capacity is available, NRAs should mandate access to civil engineering infrastructure".[148] This points towards a greater likelihood of competition occurring through the re-use of existing civil engineering assets in the European Union than it would in New Zealand.

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144 European Commission "Commission recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment" 11 September 2013, recommendation [35].

145 We also note that the New Zealand Parliament did not direct us to follow the EC approach.

146 Directive 2002/19/EC of the European Parliament and of the Council on access to, and interconnection of, electronic communications networks and associated facilities.

147 See Article 3 of "Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high speed electronic communication networks".

148 European Commission "Commission recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA)" 20 September 2010, paragraph [12] and recommendation [13].

197. More generally, the EC's rationale for its approach also appears to be based in part by the need to promote private investment in high-speed broadband via next generation networks, with a tight constraint on legacy network prices and relaxed regulation of next generation network prices being used as an incentive for such investment.[149] The EC's modified approach to TSLRIC can be seen as implementation of a specific policy framework. In contrast, in New Zealand investment in next generation networks has been facilitated by the government-subsidised UFB programme for such investment and operator migration to the new networks.[150]

198. In addition, implementing TSLRIC in the way applied by the EC would involve a decision as to what types of assets are re-useable and how they would be valued. We discuss this in more detail in Attachment E (Asset Valuation) in respect of asset valuation.

199. In respect of the EC's second rationale, regarding the risk of over-recovery of costs, in our view TSLRIC is based on forward-looking costs, and is not directly concerned with the regulated firm's recovery of past expenditure. To the extent that the regulated firm over- or under-recovers against the costs it has already incurred, then this does not alter the efficiency-enhancing properties of TSLRIC, including the incentivising of efficient build/buy decisions. In other words, one of the outcomes of TSLRIC pricing is to limit the regulated entity's ability to set prices at a monopoly level, but this is achieved by setting an objectively efficient price rather than by modelling a reasonable return on the incumbent's historic investment. As we discuss in more detail in in Attachment E (Asset Valuation) in respect of asset valuation, TSLRIC pricing in this regard differs from the approach taken under Part 4 of the Commerce Act.

200. In terms of the practical risk of over-recovery we also note the following:

200.1 We are setting a TSLRIC-based price in the factual context of a competing fibre network being built, facilitated by government subsidy,[151] and this may result in the migration of end-users from the copper network to the fibre network. Accordingly, it seems unlikely that Chorus will over-recover its costs on the copper network over the lifetime of its copper assets, when a certain

149 See recommendations [1]-[3] of European Commission "Commission recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment" 11 September 2013.

150 The EC moved to this approach after extensive consultation on these issues, with a time period of more than two years from consultation through to publication of the Commission's recommendation in September 2013 (see the discussion of timeframes at https://ec.europa.eu/digital-agenda/en/news/commission-seeks-berec-opinion-draft-recommendation-consistent-non-discrimination-obligations).

151 We note also that the UFB roll-out was subject to a competitive tender, and that would provide an element of competitive tension which would be expected to compete away, to some extent, any monopoly rents.

proportion of its customers will migrate away to fibre before costs can be recovered;[152]

200.2 We note that it is difficult to determine with any certainty whether TSLRIC-based prices would result in over-recovery for Chorus relative to its past prices. Professor Vogelsang notes that over-recovery in regards to TSLRIC-based pricing in the European Union has been driven by the modelled lifetimes for many assets being set much shorter than turned out to be the case in reality. This resulted in higher TSLRIC-based prices than were needed to recover the costs of those assets.[153] In contrast, in New Zealand there has been no previous bottom-up cost modelling approach used to determining Chorus' regulated access prices.[154]

201. We note that there is the potential for windfall gains or losses occurring when a TSLRIC-based price is reset at a future regulatory determination, if the revaluation of assets based on current replacement costs differs from what was expected (and has been reflected in the price trends) at the current determination. However, as we discuss in more detail in Attachment E (Asset Valuation) in regards to asset valuation, future resets should not result in systematic gains or losses provided the tilted annuity parameters are set in an unbiased manner.

202. We note that in the *Vodafone TSO* case the Court was also concerned, in the context of different circumstances and pricing legislation in force at that time, that Telecom did not receive a "free lunch" (per Blanchard J at [70]).

203. The *Vodafone TSO* case concerned the "cost to Telecom acting efficiently"[155] to supply the TSO service to commercially non-viable customers. In developing a model of that cost, we were not required to apply a TSLRIC methodology and the Court was not concerned with the proper approach to TSLRIC generally. Rather, the Court was considering whether the model we had developed satisfied the statutory requirement of determining Telecom's "net cost"; a statutory requirement that does not apply here.

204. In this pricing review determination, we are required to apply a TSLRIC approach and we have carried this out in the conventional way of modelling the costs of a hypothetical efficient operator constructing a new network.

152 To the extent that over-recovery did occur, this could be mitigated to some extent by competition between Chorus' copper network and the fibre networks of LFCs. That is, in non-Chorus UFB areas, Chorus may lower the price below the TSLRIC-based price cap to compete with LFCs, reducing any possible over-recovery that might have otherwise occurred.

153 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [93] and [107].

154 Moreover, we have accounted for the risk of asset stranding through the use of our asset lives (see Attachment F – asymmetric risk). This risk may or may not eventuate, and in either case the modelled asset lifetimes will not necessarily match what happens in reality, but the risk of asset stranding still exists nonetheless.

155 At [82] per Tipping J; see also [70] per Blanchard, McGrath and Gault JJ.

205. We also note Professor Vogelsang's views, that it is open to debate whether the EC's approach is within the limits of the TSLRIC concept.[156] Professor Vogelsang notes that while the EC sees its approach as consistent with the conventional TSLRIC concept, in his view the approach is in fact a break from this concept.[157]

206. In conclusion, we consider that there are important differences between New Zealand and the European Union such that, on balance, there is not a sufficiently strong case to follow the EC and move away from the conventional approach to implementing TSLRIC.[158]

207. Therefore, our further draft decision is that the conceptual economic framework underlying our TSLRIC modelling exercise is best implemented by assuming a hypothetical efficient operator building and operating an entirely new network from scratch, using modern efficient technology, to provide the relevant regulated services.

208. We believe that our hypothetical efficient operator concept is the most appropriate approach to implementing TSLRIC. In particular, we consider that this approach is the best fit with the statutory requirement to model "forward-looking" and "long-run" costs, and consistent with the conventional economic framework for implementing TSLRIC.

209. We also note that a different approach (eg, modelling an "efficient Chorus" approach) might be difficult to apply and could lead to irrational results. If the "efficient Chorus" had the existing copper network at its disposal it is not clear why it would construct a MEA. This would tend towards a cost model based on the use of the existing network. We are satisfied that such a model would not be consistent with Parliament's intention in adopting a TSLRIC model.

210. Also, TSLRIC, and the current pricing legislation, is not directly concerned with whether the incumbent under- or over-recovers. We discuss the *Vodafone TSO* case in more detail below.

211. We consider that this approach best fits with the statutory framework and the conventional economic understanding of TSLRIC. While the concept of a hypothetical efficient operator building and operating an entirely new network from scratch is important to a number of our modelling decisions, we have also remained open to revising this approach, but have not found reasons to justify this. In particular, after working through all the detailed decisions, we have remained of the view that the

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[156] Ingo Vogelsang "Reply to Comments on my November 25, 2014 paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [98].

[157] Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [103].

[158] We also note that the ACCC recently reviewed and amended the pricing principle for fixed line access in Australia. In contrast to the EC varying the implementation of TSLRIC, the ACCC rejected TSLRIC and replaced it with a building blocks approach (ACCC "Review of the 1997 telecommunications access pricing principles for fixed line services Draft Report" September 2010).

concept of a hypothetical efficient operator will best promote both the conventional TSLRIC objectives/outcomes and the section 18 purpose statement.

The concept of a MEA

212. MEA is a modern equivalent asset that an efficient operator would build today to provide the service in question.

213. As explained above, the conventional approach to TSLRIC assumes that modern and efficient technology is used to build and operate the hypothetical new network. As a framework for applying this approach, TSLRIC models applied internationally commonly use the concept of MEA.

214. Identifying and modelling the costs of a MEA is therefore consistent with the conceptual economic framework for TSLRIC, and is the conventional implementation approach used internationally in TSLRIC models.

215. Therefore, we will model the TSLRIC price of the UCLL service using the MEA concept. The use of a MEA meets the requirement to determine forward-looking costs over the long run. It is also consistent with the objectives/outcomes of TSLRIC pricing. Using a MEA allows prices to reflect the costs of modern and efficient technology, and this is consistent with providing for investment to occur where it is efficient, providing incentives for Chorus to minimise its costs in line with those incurred by an efficient operator, and allowing for the recovery of costs that are efficiently incurred.

216. However, as we noted in our December UCLL process and issues paper,[159] in the December 2014 UCLL draft determination paper[160] and above, models which centre on the concept of a hypothetical efficient operator may in practice also include information based on the existing operator's actual cost structures where these are likely to be broadly efficient. Similarly, in practice, elements of the existing network design may also be taken into account.

217. We discuss our considerations in selecting a MEA for the UCLL service later in this further draft determination (in Attachment B – MEA for UCLL).

Other relevant considerations

218. In addition to the various elements set out above, there are also other relevant considerations to our modelling decisions, which we discuss in this section.

219. In many instances our modelling decisions are informed by evidential matters. In these instances we consider our best estimate of what an objective value would be in the regulatory period. This is often the case with cost estimates – while our TSLRIC

[159] Commerce Commission "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" (6 December 2013), paragraph [85.1], footnote 26.

[160] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [150].

task requires us to estimate what the efficient cost would be, finding an appropriate value is often a task for estimation and numerical analysis.

220. Some submitters have identified the need for us to consider evidential matters. At the conference, Chorus stated that there are certain modelling questions we need to answer by reference to the best available evidence.[161] Similarly Vodafone submitted that an assessment of the evidence can be used to answer some modelling questions.[162]

221. Some of our modelling decisions may also involve other considerations, such as avoiding unnecessarily complex approaches to modelling or providing for modelling transparency. An example of this is our modelling choice regarding the use of either the Shapley-Shubik approach or capacity-based approach in respect of cost allocation (as discussed in Attachment N – Cost Allocation).

Additional legal requirements

222. The Act sets out a number of additional legal requirements that apply when determining FPP prices for the UCLL services, which we now discuss.

We must ensure no double recovery of costs recovered in prices of designated or specified services (clause 4B)

223. Clause 4B of Schedule 1 of the Act provides:

> In applying [the FPP], the Commission must ensure that an access provider of a designated service does not recover costs that the access provider is recovering in the price of a designated or specified service provided under a determination prepared under section 27 or 30M or a designated or specified service provided on commercial terms.

224. We note that the term “access provider” is used in clause 4B. The access provider of the UCLL service is Chorus, so we take into account the prices Chorus receives for the designated and specified services that Chorus provides.

225. The UCLL price we set must not allow Chorus to recover costs that it recovers in the prices of other “designated services”[163] and “specified services”[164] it provides.

161 Commerce Commission “UBA and UCLL pricing review determination conference transcript” 15-17 April 2015, p. 35.

162 Commerce Commission “UBA and UCLL pricing review determination conference transcript” 15-17 April 2015, p. 40-41.

163 A “designated service” means:
• a “designated access service”, which means a service described in subpart 1 of Part 2 of Schedule 1 of the Telecommunications Act 2001; or
• a “designated multinetwork service”, which means a service described in subpart 2 of Part 2 of Schedule 1 of the Telecommunications Act 2001. These are: Local telephone number portability service; Cellular telephone number portability service; National toll-free telephone number portability service; and Telecom's fixed PSTN to mobile carrier pre-selection service.

164 A “specified service” means a service described in Part 3 of Schedule 1 of the Telecommunications Act 2001. These are: National roaming; Co-location on cellular mobile transmission sites; and Co-location of equipment for fixed telecommunications services at sites used by Broadcast Communications Limited.

226. We will also allocate the costs we are currently modelling for the UCLL service and UBA service to avoid double recovery of those costs in the prices we set for those services. We are well placed to do that given that we are pricing the two services at the same time.

227. The particular steps we have taken to best give effect to clause 4B are explained later in this further draft determination (in Attachment N – Cost Allocation).

228. Clause 4B applies to designated or specified services provided under a STD where a regulated price applies, and designated or specified services provided on commercial terms where an unregulated price applies. Accordingly, if and how Chorus provides designated or specified services on commercial terms will affect the costs allocated to the regulated prices that we set.

229. We note that including a reasonable allocation of the forward-looking common costs of the service provider in the TSLRIC price (which we discussed above at paragraphs 111-118) is additional to this requirement in clause 4B to avoid double recovery of particular costs recovered by Chorus. If we were to conclude that a reasonable allocation of the forward-looking common costs of the service provider would lead to Chorus double-recovering costs in terms of clause 4B, then we must not make that allocation of the forward-looking common costs in the TSLRIC modelling.

We "must determine" geographically averaged price (clause 4A)

230. Clause 4A of Schedule 1 of the Act provides that, in applying the FPP for the UCLL and UBA services, we "must determine" a geographically averaged price, which is defined in clause 1 of Schedule 1 as follows:

> **geographically averaged price** means a price that is calculated as an average of all geographically non-averaged prices for a designated service throughout the geographical extent of New Zealand.

231. Prices for the UCLL service remained geographically de-averaged until 1 December 2014.[165]

232. Turning to the definition of geographically averaged price, we consider that we would only need to calculate the average of geographically non-averaged prices if we had geographically non-averaged prices to begin with. That is, we are not required to first set geographically non-averaged prices, though we may do so if we chose to.

233. In our view, Parliament's reference to calculating an average of geographically non-averaged prices simply reflected the fact that, when clause 4A was introduced, we had been setting non-averaged prices and so averaging them was the easiest and most efficient way to produce the necessary single price.

234. In this further draft determination, the modelled TSLRIC costs and the TSLRIC-based prices that we report are single national prices that apply throughout the geographical extent of New Zealand.

[165] Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011, s 73(3).

We must set an expiry date

235. In this further draft determination, we must propose an expiry date.[166][167]

236. On 13 January 2014 we published a supplementary paper to the December 2013 UCLL Process and Issues paper with our preliminary views on the effect of the expiry date under the Act.[168] We have re-stated those views in our December 2014 UCLL and UBA draft determination papers and here, which mostly continue to hold.

237. It is not clear from the Act what prices will apply for the UCLL and SLU STDs at the expiry of the UCLL pricing review determination (ie, the determination we are currently in the process of making).

238. We would expect to amend the STDs to update the UCLL and SLU prices before the expiry of the pricing review determination. This would avoid the STD prices reverting to the IPP price, which otherwise appears to be the effect of having to include an expiry date in the pricing review determination.

239. The price would be recalculated in accordance with the FPP through sections 30R and 30P(1)(a)(ii) of the Act (that is, we would not revert to the IPP).

240. We also consider that we have the ability to update the FPP price to take effect before the pricing review determination expires, either under sections 30R and 30P(1)(a)(ii) of the Act (discussed below) or if we incorporated an updating process into the price review determination itself.

241. Chorus' submission on the December 2013 UCLL Process and Issues paper sets out its understanding of that proposed approach to the expiry date.[169] We confirmed in our 14 March 2014 Further Consultation Paper that Chorus' submission broadly corresponds with our proposed process on expiry of the pricing review determinations, but that one additional step not set out in Chorus' summary is that it is possible that the UCLL model itself might need to be updated as part of amending the STDs to update the UCLL price before the expiry of the pricing review determination.[170]

242. We set a regulatory period, which has two important roles in a TSLRIC cost model:[171]

166 Telecommunications Act 2001, s 49(f). In the final determination section 52(f) of the Act requires us to set the expiry date. See also section 62.

167 The expire date relates to the price we are setting in this price review determination process. There is no expire date for the UCLL STDs.

168 Commerce Commission "Process and issues for determining a TSLRIC price for Chorus' unbundled copper local loop service - supplementary paper on expiry date" (13 January 2014).

169 Chorus "Submission in response to the Commerce Commission's Process and issues paper for determining a TSLRIC price for Chorus' unbundled bitstream access service in accordance with the Final Pricing Principle" 14 February 2014, paragraph [152].

170 Commerce Commission "Further consultation paper on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle" (14 March 2014), at paragraph [6].

171 In our December 2014 UCLL draft determination paper we stated there were three, where we separately identified a third relevant role being the timeframe over which a levelised price was applied. As we

242.1 it is an important input used to estimating the WACC;

242.2 it sets the timeframe that the TSLRIC price calculation will be in force. This means the regulatory period sets both the beginning and end dates of the model.

243. The length of the regulatory period does not affect, for example, our view of “forward-looking” in the Act’s definition of TSLRIC, or our approach to asset lives or asset depreciation.

We propose an expiry date of five years from the start date of the regulatory period

244. We sought views on the length of the regulatory period in our December 2013 UCLL Process and Issues paper. Most submissions supported a five-year regulatory period. However, Chorus argued that ten years would be the appropriate length for the regulatory period. This was primarily because, in its view, that length of time would provide more certainty for business planning and investment.[172]

245. In our December 2014 UCLL and UBA draft determinations, we noted that our consultations up to that date regarding the regulatory period had not included any reference to the possibility of backdating of the determination.[173] Our comments to that point had been based on the assumption that what we referred to as the regulatory period would begin on the date of the final determination. Accordingly, we noted that we interpreted the submissions on the regulatory period as addressing the issue of the expiry date of the determination, ie, submissions favouring a five-year regulatory period advocate an expiry date five years after the date of the final determination. We noted also that backdating, if we decide that it was warranted, could be implemented by way of some form of adjustment to the regulatory period.

246. In the discussion below we continue to use the term “regulatory period” for convenience but the term should be interpreted as referring to the period starting five years from the start date of the regulatory period.

247. In our July 2014 Regulatory Framework and Modelling Approach paper, we outlined our preliminary view that:

247.1 a five-year regulatory period is the most appropriate for our TSLRIC modelling; and

discuss further in Chapter 3 of this further draft determination, we are no longer setting a levelised price over the regulatory period.

172 Chorus "Submission in response to the Commerce Commission’s Process and issues paper for determining a TSLRIC price for Chorus’ unbundled copper local loop service in accordance with the Final Pricing Principle" 14 February 2014, paragraph [23].

173 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [236]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [207].

247.2 we should have the same regulatory period for both the UCLL and UBA services. This is supported by the Act's requirement that we consider the relativity between the UCLL service and the UBA service.[174]

248. We outline below the reasons we gave in that paper, with some modifications we proposed in our December 2014 UCLL and UBA draft determination papers based on further consideration of the issue and submissions:

248.1 We consider five years to be supported by the broader legislative context. The Act does not define how often we should review a STD (or in this case the part of a STD that relates to price). However, it does provide some guidance that suggests a five-year regulatory period is appropriate.

248.1.1 Five years is the period within which we must consider whether to review whether a service should remain regulated. Schedule 3 provides that we must consider:[175]

> … at intervals of not more than 5 years after the date on which a designated service or specified service came into force, whether there are reasonable grounds for commencing an investigation into whether the service should be omitted from Schedule 1 under s 66(b).

248.1.2 Given that the Act requires us to review whether to deregulate a service within five years, it is appropriate that we should endeavour to review prices in STDs at no longer than five-year intervals.

248.2 Also, the telecommunications markets at issue are fast changing, both in terms of technology and the applicable regulatory settings. Accordingly, we consider that a ten-year regulatory period could be too long, as inputs used in our cost model and modelling decisions could become out of date or become less appropriate over ten years compared with five years.

248.3 The approach used internationally is for a shorter regulatory period as adopted by some international regulators (for example, Sweden, France, Denmark, Ireland and Germany all support a regulatory period of three years or less).[176]

248.4 It is likely that in 2019, the roll-out of fibre to deliver UFB will be significantly further advanced and we will have a better idea of the effects of UFB migration on the markets for UCLL and UBA. By then the Government's review of the Act should have been completed and any changes will have taken effect.[177]

174 Telecommunications Act 2001, s 19(b) and Schedule 1, Part 2, Subpart 1.
175 Telecommunications Act 2001, Schedule 3, clause 1(3).
176 Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [321].
177 Telecommunications Act 2001, s 157AA.

248.5 In combination, the above matters also seem to us to suggest that a seven-year period would be too long.

249. We note that section 53M of the Commerce Act 1986 requires every price-quality path to have no longer than a five-year regulatory period. This is more prescriptive than the Act, but it is widely agreed that the telecommunications market is a faster changing market, which supports our view that we should be reviewing STD prices at intervals of no longer than five years.

250. In response to our July 2014 Regulatory Framework and Modelling Approach paper, Vodafone and Spark supported our preliminary view of a five-year regulatory period for both the UCLL and UBA services.[178,179] Chorus stated that it would prefer to have a reasonable period of price stability in order to focus on the UFB roll-out and migration of customers.[180] Chorus re-iterated that it would like a longer regulatory period, and suggested a compromise of seven years, in order to balance regulatory and pricing stability.[181]

251. In our December 2014 UCLL and UBA draft determination papers we continued to hold the view that we should set the expiry date to be five years from the date of our final determination.[182] Chorus is the only party to submit further on the issue of the regulatory period. Chorus maintained its position that a ten-year regulatory period, or as a compromise a seven year period, is appropriate.[183] Chorus submitted that a longer period would provide a period of price stability over which it could focus on the UFB roll-out and migration of customers to UFB, and would provide certainty for Chorus and its customers while the Government's review of the legislative process takes place.[184]

252. We acknowledge that a ten- or seven-year regulatory period could be appropriate in certain circumstances. However, on balance, we remain of the view that we should set a five-year regulatory period.

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178 Vodafone NZ "Submission to the New Zealand Commerce Commission - Comments on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, section D2.

179 Telecom "UCLL and UBA FPP: consultation on regulatory framework and modelling approach – Submission Commerce Commission " 6 August 2014, paragraphs [154]-[155].

180 Chorus "Submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paragraph [176].

181 Chorus "Submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paragraph [179].

182 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [243]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [214].

183 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 February 2015, paragraph [355].

184 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 February 2015, paragraph [356].

253. We consider that a five-year regulatory period provides the appropriate balance between providing for a reasonable period of price stability, while allowing for our cost model and modelling decisions to remain up-to-date in a fast-changing telecommunications market.

254. However, we may need to reconsider the length of the regulatory period should any relevant decisions in this further draft determination change following submissions

255. Prior to the end of the expiry date of the pricing review determination, we would expect to conduct a review under section 30R of the Act, regarding the price payable for the service for the next five-year period (the FPP price reset).

256. As well as considering and determining a price for the service for the next five-year regulatory period, we would expect to update the inputs in our cost model and review whether any other change in circumstances since our previous pricing review determination causes us to reconsider any of our fundamental modelling decisions. The Act defines a "change in circumstances" as follows:[185]

> change in circumstances, in relation to the price payable for a service, means any change in relevant circumstances since the last date on which that price was calculated (for example, any change to the terms of the service).

257. Without limiting our discretion, we consider that we would be unlikely to revisit all of the choices we made during the regulatory period of this pricing review determination process.

Section 19(b) and relativity

258. Section 19(b) requires us to consider any additional matters specified in Schedule 1 regarding the application of section 18. For the UCLL/UBA services, that additional matter is the relativity between the UCLL service and the UBA service. We discuss this in more detail in Chapter 4. We note briefly here that the relativity of the price of UCLL service to the price of UBA service will affect incentives to unbundle, and considering relativity therefore involves consideration of the weight we give to unbundling incentives. We note also that it is the price of the UBA increment (the price of additional costs incurred in providing the UBA service) that is the primary driver of incentives to unbundle.

259. By way of summary of our discussion of the relativity consideration in Chapter 4, we find that relativity guides us less towards attempting to promote unbundling, and more towards the efficiency aspects of the section 18 purpose statement. We consider that we should be neutral towards the promotion of unbundling, and allow for unbundling to occur to the extent that it is efficient.

TSLRIC definition: costs incurred in relation to a TSO instrument

260. Limb (b) of the Act's definition of "forward-looking common costs" provides that they do not include "any costs incurred by the service provider in relation to a TSO

185 Telecommunications Act 2001, s 30B.

instrument". We have considered the meaning of limb (b). Before discussing that meaning, we first set out a brief explanation of the TSO instruments.

261. The term "TSO" is an abbreviation of "telecommunications service obligations" which the Act defines as "obligations in relation to a TSO instrument".[186] The relevant TSO instruments are:[187]

261.1 the "TSO Deed for Local Residential Telephone Service" (which we refer to here as the Spark Deed), and

261.2 the "TSO Deed for TSO Network Services" (which we refer to here as the Chorus Deed).

262. In essence, the obligations that arise from those TSO instruments ensure the provision of a residential voice service on certain lines. The provision obligations are split between Chorus, who provides the underlying connection to the end-user in accordance with the Chorus Deed, and Spark, who provides the voice service across Chorus' network in accordance with the Spark Deed.

263. The Chorus Deed contains the following principles:[188]

263.1 Principle 1: Chorus will charge Spark no more than an amount equivalent to the regulated price of Chorus' unbundled copper low frequency (UCLF) service (as amended from time to time) for the "TSO network service", [189] which is the baseband service Chorus provides to Spark as the input service for use by Spark in providing the local residential telephone service under the Spark Deed. Chorus will charge Spark no more than that amount provided that the overall profitability of "Chorus' fixed business" is not or will not be unreasonably impaired (as evidenced by audited accounts prepared for that business). Chorus may selectively offer lower prices, including on a geographical or customer segment basis, if it wishes.

263.2 Principle 2: Chorus will make the "TSO network service" as widely available to Spark as Spark is required to make the local residential telephone service available under the Spark Deed. In turn, the Spark Deed states that Spark will continue to make local residential telephone service as widely available as it was at 20 December 2001 – that area is known as the "TSO footprint".[190]

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186 Telecommunications Act 2001, s 5.

187 See www.med.govt.nz/sectors-industries/technologycommunication/communications/telecommunications-service-obligations. There is also a TSO Deed for Telecommunications Relay Services, between the Crown and Sprint International New Zealand, which is not relevant to the UCLL service.

188 See clause 5 of the TSO Deed for TSO Network Service (8 November 2011), accessible from the link in the footnote immediately above.

189 The UCLF service is described at below.

190 TSO Deed for Local Residential Telephone Service (8 November 2011), principle 3 at clause 5.3.

264. Accordingly, the TSO footprint is a subset of the total connections in Chorus' access network, as all business connections and any residential connections after 20 December 2001 are not included in the TSO footprint.

265. The Chorus Deed, together with provisions in the Act,[191] provide a mechanism for Chorus to potentially recover any additional costs incurred in providing the TSO network service that it does not recover by charging an amount equal to the regulated price for UCLF. (The regulated price for the UCLF service for relevant purposes is the regulated price under the UCLL STD, which is one of the UCLL service prices we are currently setting.)[192] Chorus can apply to be able to charge more for the TSO network service, if it considers that the overall profitability of its fixed business has been, is being, or will be unreasonably impaired.[193] If Chorus did so, we would be required to determine those costs of complying with the TSO instrument and record them in a cost calculation determination.[194] Those additional costs, which are known as "TSO charges", are then payable by the Crown to the service provider (Chorus) to compensate it for the additional costs above the UCLL STD price of providing the service.[195]

266. Our view is that limb (b) of the Act's definition of "forward-looking common costs" is intended to make it clear that if Chorus receives a TSO payment, then the corresponding TSO costs must be excluded from the TSLRIC calculations for the UCLL service as otherwise they would be recovered twice.

267. We consider this interpretation is supported by the legislative and policy history. Limb (b) of the Act's definition of "forward-looking common costs" has remained unchanged since the Act was originally enacted in 2001. The Act followed the Fletcher Inquiry, which reported in September 2000. At the time of the Fletcher Inquiry, the TSOs were called the Kiwi Share obligations, or KSOs. The Inquiry said:[196]

> Kiwi Share Losses
>
> … the Inquiry recommends that in all cost-based pricing determinations on Telecom's fixed network no recovery of Kiwi Share obligation losses be incorporated. This means that, in the benchmarking exercises, any additions countries make to call related prices to recover access deficits or universal service losses should be removed, and nothing added for any KSO losses. Similarly, in any TSLRIC modelling the KSO losses should be deducted from total network costs and the number of residential local calls should be included in usage even though they are free.

268. It went on to recommend:

> 20. Cost-based prices should not include a contribution to any losses arising from Telecom's Kiwi Share obligations.

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191 Telecommunications Act 2001, ss 71A, 94, 94C and 94D.
192 Telecommunications Act 2001, Part 2, Subpart 1, description of Chorus's Unbundled Copper Low Frequency Service.
193 TSO Deed for TSO Network Service (8 November 2011), clauses 7-12.
194 See Telecommunications Act 2001, Part 3, Subpart 2, and particularly ss 94 and 94K.
195 Telecommunications Act 2001, s 94L.
196 Ministerial Inquiry into Telecommunications, Final Report, 27 September 2000, p. 69.

269. When the Act was originally enacted in 2001, what is now the UCLF service was not a designated service and the price Telecom was permitted to charge under the Deed applicable at the time was based on the standard residential rental price applicable at 1 November 1989 (ie, a retail-based price).[197] In addition, Telecom could be paid the net cost of complying with the TSO instrument.[198] Currently, Chorus is receiving the UCLF price for TSO lines, and the UCLF price is the regulated price for the UCLL STD. Unless and until Chorus applies for and receives TSO charges in respect of the Chorus Deed, we do not consider that there are any relevant costs to be excluded under limb (b).

270. An alternative interpretation of limb (b) of the Act's definition of "forward-looking common costs" is that Parliament intended for us to exclude any lines to end-users within the TSO footprint that only deliver voice services from the hypothetical network we use to model the costs of the UCLL service. This approach would be premised on the proposition that lines where Chorus does not offer a broadband service are presumably lines where it is not economic for Chorus to offer broadband services and so it only maintains those lines for the provision of voice service because of its TSO obligations under the Chorus Deed. For the purposes of this discussion only, we refer to those lines as "TSO lines".

271. If we preferred this interpretation, in practical terms it would mean reducing the number of lines within the TSO footprint that are included in the hypothetical network we use to model the costs of the UCLL service, by removing these "TSO lines". That would mean that both the common cost (costs not directly attributable) and incremental costs (costs directly attributable) of providing these TSO lines would be excluded. This interpretation would be inconsistent with the fact that limb (b) comes within the definition of "forward-looking common costs".

272. Furthermore, excluding these "TSO lines" would appear to create a gap as they would be excluded from the UCLL TSLRIC model even though they are recovered through the UCLF price which is based on the UCLL price. We consider that if Parliament had intended these "TSO lines" to be excluded entirely from our calculation, it would have made this more explicit.

273. In our view the alternative interpretation is unlikely to reflect Parliament's intention. The better interpretation is that limb (b) was included to avoid double recovery and is only relevant where Chorus receives a separate payment for TSO additional costs (ie, the TSO charges). Given that the Act links the price of the UCLF service to UCLL, and that Chorus has not applied to recover TSO additional costs, we are not currently required to address any potential for double recovery in relation to TSO costs in our model.

274. If now or at any time in the future Chorus was receiving TSO charges, then we consider it would be open to us to initiate a section 30R review and consider

[197] See Telecommunications Service Obligations (TSO) Deed for Local Residential Telephone Service (December 2001), clause 7.2.

[198] Telecommunications Act 2001, as originally enacted, ss 80-94.

whether there had been a changes in circumstances necessitating an update of the price of UCLL (and therefore UCLF).

The Act links the price of the UCLF service to the prices we set in this pricing review determination

275. The UCLF service is similar to the UCLL service but it only enables access to and interconnection with the low frequency (being the frequency band between 300 and 3400 Hz) in Chorus' copper local loop network. Broadband cannot be provided over the UCLF service, as bitstream services use higher frequencies.

276. The UCLF service was inserted as a designated access service in Schedule 1 by the Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011 (Amendment Act) which allowed Chorus to structurally separate from Telecom (now Spark). Telecom was prohibited from purchasing UCLL until 1 December 2014,[199] but was able to purchase the UCLF service. That is, although Spark was unable to unbundle for three years, it could purchase the UBA service to provide broadband to end-users, or purchase the UCLF service to provide voice services (but not broadband) to end-users.

277. The IPP for the UCLF service is:[200]

> Either—
> (a) the geographically averaged price for Chorus's full unbundled copper local loop network; or
> (b) if a person is also purchasing Chorus's unbundled bitstream access service in relation to the relevant subscriber line, the cost of any additional elements of Chorus's local loop network that are not recovered by the price for Chorus's unbundled bitstream access service

There are different views about the meaning of the Act's pricing principle for the UCLF service

278. The phrase "Chorus's full unbundled copper local loop network" was introduced by the 2011 Amendment Act, and it did not previously appear in the Act.[201] When we first set the price for the UCLF service, before the 2011 Amendments came into effect on 1 December 2011, we set it as the price in the UCLL STD.[202] At that time, the price in the UCLL STD was the price set in 2007 when there were comparatively very few cabinets in Chorus' local loop network.

279. When we later re-benchmarked the prices of UCLL services, we reconsidered what the price for the UCLF service should be. Two key views emerged as to what the Act's pricing principle for the UCLF service required.

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199 See the "access seeker" description in the description of "Chorus's unbundled copper local loop network" in Subpart 1 of Part 2 of Schedule 1 of the Telecommunications Act 2001.

200 Telecommunications Act 2001, Schedule 1, Part 2, Subpart 1.

201 The phrase also appears in the pricing principles for the designated access service: "Local access and calling service offered by means of fixed telecommunications network", but in no other place in the Act.

202 Commerce Commission "Standard terms determination for the designated service of Chorus's unbundled copper low frequency service" Decision 738 (24 November 2011), paragraphs [57]-[63].

280. One view was that the price of "Chorus's full unbundled copper local loop network" refers to the price in the UCLL STD, which is the approach we first took to setting the price for the UCLF service. This is based on the word "full" referring to the full-loop of the UCLL service as opposed to the sub-loop of the SLU service. The Act provides a service description for "Chorus's unbundled copper local loop network", which describes both non-cabinetised and cabinetised lines, and we had created separate STDs for UCLL and SLU.

281. The other view was that the price for the UCLF service should be an averaged price for both non-cabinetised and cabinetised lines. Together those types of lines are the "full" unbundled copper local loop network, which was termed full-UCLL. The price for cabinetised lines includes SLU and SLES (that is, the copper feeder from the cabinet to the exchange), being the services needed to connect an end-user to an exchange on the copper network. This means that under this view the prices for SLU and SLES would also become relevant to setting the price for the UCLF service.

282. We took the latter view during part of our consideration of the UCLL re-benchmarking process.[203] However, when we came to benchmark the prices, applying the IPP, we found that the benchmarking data did not allow us to distinguish between NCUCLL (non-cabinetised local loop) and full-UCLL prices. As a result, we set a single price for NCUCLL (UCLL STD price) and full-UCLL (UCLF price), without having to resolve the interpretation of the Act's pricing principle for the UCLF service, and noted that the issue was better suited to a TSLRIC FPP process.[204]

We remain of the view expressed in the UCLL December 2014 draft determination paper

283. In the UCLL December 2014 draft determination paper we expressed the view that the word "full" was likely intended by Parliament to refer to the full-loop of the UCLL service as opposed to the sub-loop of the SLU service, and that the price for the UCLF service should be the price in the UCLL STD. We remain of this view.

284. We consider that, at the time of the 2011 amendments, the word "full" was an established industry term of art used to refer to the full-loop service of UCLL (that is, the loop from the end-user to the exchange on non-cabinetised lines) as opposed to the sub-loop service of SLU between the end-user and a cabinet. This is, for example, the terminology used throughout our SLU STD in 2009. We consider that if Parliament had intended a more significant change – that is, the introduction of a new concept of a full-UCLL price that includes both cabinetised and non-cabinetised lines – then this would have been more clearly expressed in the Act and would have been discussed in the legislative history.

[203] See, for example, Commerce Commission "Revised view on whether there are reasonable grounds to commence a schedule 3 investigation into the pricing principles for Chorus' UCLF service" (17 August 2012), paragraphs [13]-[14].

[204] Commerce Commission "Final determination on the benchmarking review for the unbundled copper local loop service" [2012] NZCC 37 (3 December 2012), paragraphs [308]-[321].

285. Further, we consider that setting a price for the UCLF service equal to the price in the UCLL STD fits better with the rest of the Act and is more likely to give effect to the section 18 purpose statement. That is because setting different prices for the UCLF service and for UCLL STD service could lead to arbitrage. If the price for the UCLF service was greater, RSPs could buy the UCLF service on cabinetised lines and buy the UCLL STD service on non-cabinetised lines, but Spark could not have that advantage during the period it is prohibited from purchasing any UCLL service. In our view, we should, as a general principle, read the words of the Act as being consistent with the section 18 purpose statement.[205]

Our approach to setting TSLRIC prices for UCLL and SLU is consistent with both views

286. As explained in Attachment N (Cost Allocation), we take the TSLRIC cost of the unbundled local loop (ULL) and derive TSLRIC prices for the UCLL and SLU STDs.[206] To do this we have taken an aggregation approach, which is that the price of the UCLL STD service will be equal to the price of the SLU STD service plus the modelled TSLRIC price of SLU backhaul. That is, price of UCLL STD = price of SLU STD + modelled TSLRIC price of SLU backhaul.

287. Given our views above, the UCLF price will be based on the UCLL STD service price.

288. However, we note that as a result of our approach to aggregation, the same price would apply for the UCLF service even if it was based on full-UCLL. The details of our approach are explained in Chapter 3.

289. Accordingly, setting the price for the UCLF service equal to the UCLL STD price is in fact consistent with both views about the meaning of the Act's pricing principle for the UCLF service given our approach to aggregation. Taking either view would lead to the same result.

290. If there is concern about the Act's pricing principle for the UCLF service, we could consider it as part of a Schedule 3 investigation into the UCLF service.[207]

Our views in relation to the *Vodafone TSO* case

291. Submissions were exchanged about whether the *Vodafone New Zealand Ltd v Telecom New Zealand Ltd* (the *Vodafone TSO* case)[208] was a relevant or binding consideration for this process. We express our view on the applicability of this case below.

292. The *Vodafone TSO* case concerned the provision of residential telephone connections to commercially non-viable customers (CNVCs). Under the TSO regime in effect at the time, Telecom provided a residential telephone connection to CNVCs

205 Chorus v Commerce Commission [2014] NZCA 440 at [153].

206 ULL is not the same as full-UCLL. ULL includes UCLL and SLU, but not SLU backhaul or SLES. Full-UCLL includes all of UCLL, SLU and SLES.

207 See Telecommunications Act 2001, ss 66(c)(vi) and 68.

208 *Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138, [2012] 3 NZLR 153.

and obtained recompense from other telecommunications service providers who connected to its network.[209]

293. Telecom was entitled to compensation for the "net cost" of meeting the TSO obligations as calculated by us. This was not to be based on Telecom's actual costs, but rather Telecom was entitled to recover the "unavoidable net incremental costs to an efficient service provider" of providing the TSO service.[210] That calculation was required to take into account "the range of direct and indirect revenues and associated benefits" of providing the service to CNVCs, less the costs of doing so, and "the provision of a reasonable return on the incremental capital employed in providing the services to those customers."[211]

294. In other words, the purpose of the net cost formula was to allow Telecom to recover "the cost to it of efficiently servicing its commercially non-viable customers."[212]

295. The issue before the Courts was whether we had erred in law by choosing a model based on Telecom's existing core copper network with limited optimisation and valuing that network at its replacement cost. The Supreme Court found that our approach was inappropriate for two reasons:

295.1 We had failed to adjust its model to allow for the introduction of mobile technology that would be used by an efficient service provider.[213]

295.2 We had used a replacement cost methodology to value old assets that were partially or wholly depreciated and would not in reality be replaced by Telecom in the future.[214]

296. As a result, we were required to reconsider various TSO net cost determinations.

297. As explained above, the *Vodafone TSO* case concerned the calculation of the "net cost" to an efficient service provider of meeting the TSO obligations, by delivering a residential telephone connection to CNVCs. The model which we constructed was required to be based on the premise that the efficient service provider would be "a proxy for a firm which will continue to employ old assets".[215]

298. Our current task is being undertaken under different regulatory provisions and in a different context. Indeed, we must apply TSLRIC pricing rules to model the costs of a hypothetical efficient operator constructing and operating a new network. As explained earlier in this Chapter, our hypothetical efficient operator is an "efficient entity" (which is not Chorus, but a total substitute for Chorus).

209 At [1].
210 Section 5.
211 Section 84(1).
212 At [82] per Tipping J.
213 At [9] and [17] per Elias CJ; and at [74]-[76] per Blanchard, McGrath and Gault JJ.
214 At [70]-[72] per Blanchard, McGrath and Gault JJ and [81] per Tipping J. Elias CJ declined to express a view: [15].
215 At [70] per Blanchard, McGrath and Gault JJ.

299. For the reasons given further below, we consider that our approach to determining the TSLRIC of the UCLL services is aligned with the principles to be derived from the Supreme Court's judgment. In summary:

299.1 We have properly applied the relevant provisions of the Act and produced an appropriate model of the hypothetical efficient operator for these purposes.

299.2 In relation to optimisation, we have ensured that we have appropriately optimised our model by:

299.2.1 Taking an approach to the network optimisation that is efficient and appropriate to the current circumstances (we discuss the approach we have taken to network optimisation in Attachment C – Network Optimisation); and

299.2.2 Using a MEA that incorporates a combination of the most efficient technologies currently available, FTTH and FWA.

299.3 In relation to the use of a replacement cost methodology:

299.3.1 The *Vodafone TSO* case concerned the "cost to Telecom acting efficiently" to supply the TSO service to CNVCs.[216]

299.3.2 In contrast, for the UCLL services, we have followed a conventional TSLRIC approach and sought to model the costs of a hypothetical efficient operator constructing and operating a new network. That is, we are assuming a new build and not modelling the costs of an existing entity which would continue to employ old assets.[217]

299.3.3 We have considered whether this outcome should cause us to revisit the hypothetical efficient operator model. For the reasons discussed below, we have not changed our approach.

300. We are therefore satisfied that we have constructed an appropriate model for determining the cost of the UCLL service that is fit for purpose.[218] As explained in the Attachment E (Asset Valuation), our approach to asset valuation at future resets should not lead to revaluation gains or losses, as long as the tilts are correctly estimated.

216 At [82] per Tipping J; see also [70] per Blanchard, McGrath and Gault JJ.
217 At [70] per Blanchard, McGrath and Gault JJ.
218 Cf [73] per Blanchard, McGrath and Gault JJ.

Chapter 2: How we have calculated the TSLRIC for the UCLL service

301. In this Chapter we set out the decisions we have made in determining the cost of the UCLL service. We describe the steps we have taken to determine the cost, and summarise the draft decisions we have made for each step.

301.1 Step 1 – Determine the network footprint to be modelled for the UCLL service. In this step we determine the size of the network footprint over which the UCLL service will be modelled.

301.2 Step 2 – Determine the hypothetical network to be modelled. Under this step, we identify the most efficient way of providing the UCLL service using modern technology. This involves determining the MEA for the UCLL service, the degree of optimisation in the modelled network, and how the hypothetical efficient operator would deploy the modelled network.

301.3 Step 3 – Determine the cost of the modelled network. In this step we determine the costs of the modelled network, including the valuation of assets, the annualisation of capital costs, operating costs, and the treatment of capital contributions.

301.4 Step 4 – Allocate costs to services provided by the hypothetical efficient operator. This step involves allocating the forward-looking common costs across services provided by the hypothetical efficient operator, and then calculating the cost of the UCLL and SLU services, which is discussed in Chapter 3.

302. We have engaged TERA Consultants to build the cost model for the UCLL (and UBA) service and provide expert advice on TSLRIC modelling. Alongside this paper we have published a number of reports compiled by TERA that provide further detail on how it has built the cost model for the UCLL service. [219] We have reviewed these reports produced by TERA and agree with the advice and approach TERA have provided and taken in building the cost model for the UCLL service.

303. Having consulted extensively and considered submissions, we set out below our key further draft decisions on our approach to modelling the cost of the UCLL service.

304. The cost model consists of five parts:[220]

304.1 Geo-spatial data processing – determines all cable paths from the end-user dwellings to the network nodes;[221]

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219 See TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services – Model Reference Paper" June 2015.

220 For a full description detailing the specification of the cost model see TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Model Specification" June 2015.

221 The geo-spatial processes we have undertaken are summarised in TERA's Model Specification paper.

304.2 Access network dimensioning – dimensions the access network based on the geo-spatial data analysis (for example, cables, civil engineering);

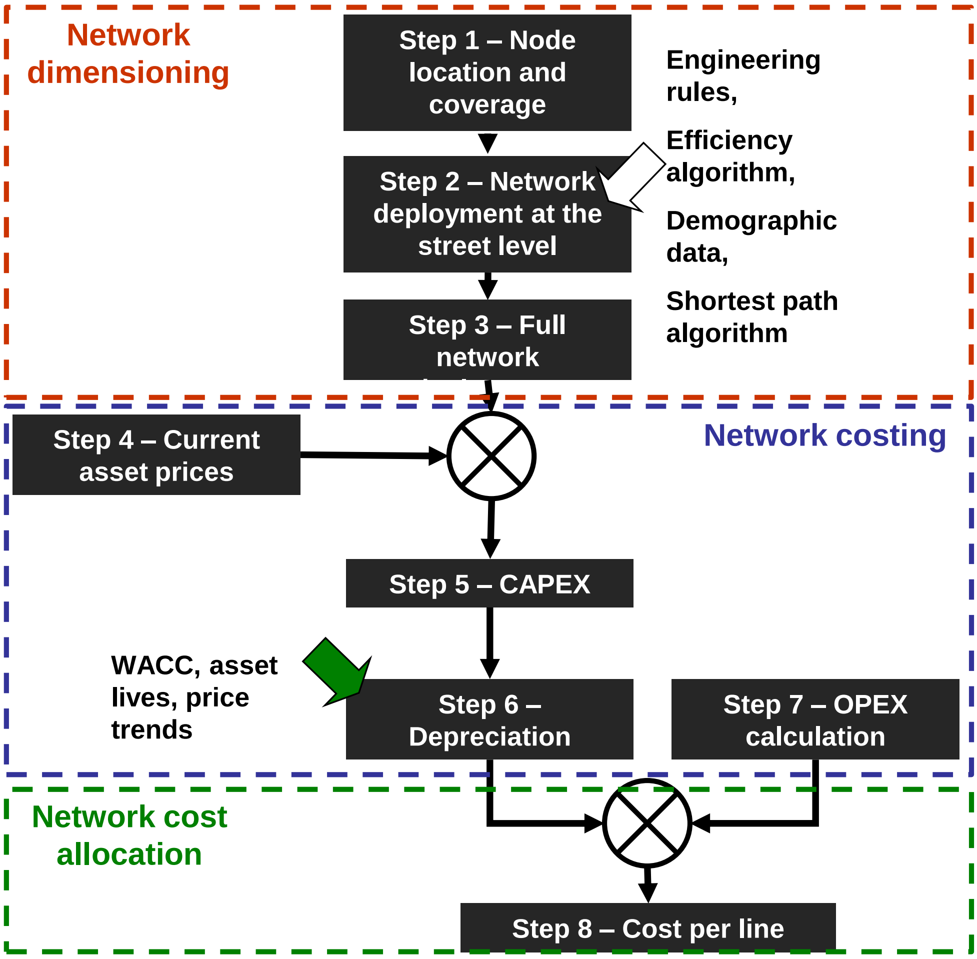
304.3 Access network model – once the access network is dimensioned, costs are derived by multiplying the network inventory by the unit costs;

304.4 Opex model – derives the opex and non-network costs for each service; and

304.5 Core network model – dimensions and derives the costs of the core network and derives the price for each service.

305. The decisions we set out in this Chapter relate to the dimensioning and costing of the access network, which derives the cost for the UCLL service. Figure 1 below illustrates how the cost of the UCLL service is derived in the access network model.

Figure 1: Access network modelling approach



306. Detailed discussions and reasons for our further draft decisions are included in Attachments to this further draft determination.

307. Matters of a more technical nature are addressed in TERA's review of submissions document, which we have published alongside this further draft determination. [222] We have discussed these "technical" submissions with TERA. Responses to these points are set out in TERA's review of submissions. We have reviewed this document and we agree with TERA's responses to the submissions made.

Determining the network footprint for the UCLL service

308. The hypothetical efficient operator network footprint determines the number of connections that comprise the network, and informs where the modelled network will be deployed.

309. Our objective, in setting the hypothetical efficient operator's network footprint, is to establish an appropriate scale operator for the provision of the UCLL service that (in conjunction with demand) results in an average unit cost that meets our TSLRIC objectives and section 18 purpose.

310. Our earlier views on the network footprint for UCLL focussed on the extent to which our hypothetical efficient operator had either an obligation or other commercial incentive to connect and provide service to end-users. Accordingly, the responses we received from Vodafone and Spark encouraged us to determine "commercially viable" and "economical" lines to serve.

311. Our revised views on the scope of the UCLL network footprint is that the exercise is less about funding, and more about establishing an appropriate scale for the provision of the UCLL service.

312. We consider the UCLL service to be a national service. Accordingly, our modelled hypothetical efficient operator network is a national network, and it is efficient that (within the point-in-time modelling requirement of TSLRIC) the network is "built" to connect every address along New Zealand's road network.

313. Attachment A provides a detailed discussion of how we have reached our further draft decisions regarding the network footprint.

Determining the modelled network

314. Once we have determined the network footprint for the UCLL service, we then must determine the efficient costs of serving that footprint. To do so we have first considered the MEA for the UCLL service to determine what we consider a hypothetical efficient operator would likely build today to provide the UCLL service (the modelled network). We have then considered how the hypothetical efficient operator would likely deploy that network, including the level of optimisation employed relative to Chorus' network.

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222 See TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services – Analysis of the industry comments following the December 2014 draft determinations" June 2015.

Selecting the MEA for the UCLL service

315. We have taken a “core functionality” approach to determine the service that the MEA technology must be capable of providing. Our view is that the “core functionality” approach allows us to model an equivalent service that best meets our TSLRIC objectives and the requirements of the Act. This approach allows us to identify and optimise the UCLL service and therefore determine, for the purpose of the hypothetical efficient operator, the efficient forward-looking incremental costs it would face in providing the service.

316. In our view, an efficient replacement for a copper network would not necessarily allow for layer 1 access by access seekers across the whole network. While we acknowledge that access to layer 1 services allows competition and provides choice for end-users, which is in accordance with the section 18 purpose, we consider that it is not necessary for the hypothetical efficient operator to provide this level of functionality across the whole network.

317. Therefore, we remain of the view that the “core functionality” of the service is simply to allow access seekers to provide voice and broadband service to end-users. We consider it is reasonable to assume that the hypothetical efficient operator, entering the market would have certain regulatory obligations placed on it in this regard, therefore, we also consider that the MEA should be able to provide, to a large extent, a point-to-point, unbundleable layer 1 service.

318. In this context, we have considered which technologies the hypothetical efficient operator would deploy that would allow it to meet its regulatory obligations. Where the capability of Chorus’s copper access network means that end-users can receive voice-only or low-speed data services, we consider that a replacement network that provides unbundleable, point-to-point service provides significantly more capability than required, and that this would not be an appropriate MEA. Accordingly, the unbundleability and point-to-point features of the MEA network are not required throughout the whole network and we have considered Fixed Wireless Access (FWA), as the appropriate alternative technology, for lines that we identify as low capability lines.[223]

319. In our view a hypothetical efficient operator replacing the existing copper network would ensure it deploys the most future proof technology, which in our view is a Fibre to the Home (FTTH) network, with FWA on the edges of the network. Therefore, having regard to the “core functionality” and the other key features that we consider the MEA technology should be capable of providing, such as unbundleability and a point-to-point connection, it is our view that a hypothetical efficient operator would be likely to deploy a point-to-point FTTH network, given its longer useful life and its additional capability, which limits the likelihood of obsolescence.

320. Attachment B provides a detailed discussion of how we have reached our further draft decisions regarding the MEA for the UCLL service.

[223] For further details on our approach to FWA modelling, see Attachment D.

Optimising the network we have modelled

321. In relation to optimisation, we have ensured that we have appropriately optimised our model by taking an approach to the network optimisation that is efficient and appropriate to the current circumstances.

322. We have adopted an optimally-structured network approach which is constrained only by the existing number of nodes and their existing locations, and follows the road network. All other aspects are open to optimisation.

323. We accept that the hypothetically efficient operator building an entirely new network would theoretically lead to a scorched earth approach being our starting point for network optimisation rather than a modified scorched node approach.

324. However, optimising on a scorched earth basis by eliminating or moving MDFs, while conceptually consistent with our hypothetically efficient operator, simply amounts to shifting cost between the access network and the core network. This does not materially reduce the total costs of the network as each end-user will still have to be connected back to the node and from the node further back in the network.

325. Also, as explained in Chapter 1, real world information may be used to inform our assessment of what constraints a hypothetical efficient operator would be likely to face and decisions it would be likely to make.

326. In this regard, we have optimised the MDF coverage areas instead of using the existing coverage areas in Chorus' copper network.

327. The main reasoning for this is that optimising the MDF coverage areas results in lower network costs and we consider that a hypothetical efficient operator would follow this approach.

328. We have modelled the size of exchange buildings based on a bottom-up calculation of the required space and equipment.

329. The main reasoning for this is that basing the calculation of the size and therefore cost of required sites in the model on a bottom-up approach reflects the efficient costs of building an equivalent service today as we consider that a hypothetical efficient operator would not be deploying sites larger than required

330. Attachment C provides a detailed discussion of how we have reached our further draft decisions regarding network optimisation.

Demand over the regulatory period

331. The hypothetical efficient operator demand determines the number of connections over which total modelled costs will be spread. Our objective, in setting the hypothetical efficient operator's demand, is to establish an appropriate scale for the provision of the UCLL service that (in conjunction with the network footprint) results in an average unit cost that meets our TSLRIC objectives and Section 18 purpose.

332. We have been considering parties' views on demand, and in light of our framework, which assumes existing networks remain in place alongside our hypothetical efficient operator, we believe it is best to treat demand residing on these other networks consistently. However, having excluded HFC demand and included non-Chorus LFC demand in our December 2014 UCLL draft determination paper, we must now consider whether to include or exclude all non-Chorus demand.

333. After further consideration of submissions, we consider that the appropriate scale for the UCLL service is national demand - serving all active fixed line connections.

334. Our modelling assumptions in relation to demand growth and migration are relevant for calculating unit costs over time. We must determine to what extent changes in the market – population growth and/or migration to or away from the network – should be modelled.

335. There are a number of factors that determine the demand for regulated UCLL. During this process we have heard from submitters on aspects such as population growth, migration to Chorus' UFB network, migration to non-Chorus LFC networks, and fixed to mobile substitution.

336. Our December 2014 UCLL draft decision to assume constant demand was not because we think these factors are irrelevant considerations, or that their cumulative effect necessarily results in a constant level of demand. However, we have not been presented with compelling evidence that fixed line growth on the copper network will be significant during the regulatory period. And in the case of migration away from Chorus' network, we do not support excluding demand on the basis of competition, since the effect on TSLRIC prices would be contrary to the normally observed effects of competition.

337. Accordingly, we have maintained our earlier draft decision to assume that there is no demand growth or migration of hypothetical efficient operator connections.

338. Our modelling assumption in relation to demand take-up is relevant for calculating unit costs over time. In accordance with our assumption that the hypothetical efficient operator serves all active fixed line demand, we set demand to be equal to that level from the first year of the analysis. We have described this as the "fully-loaded demand assumption.

339. In our December 2014 UCLL draft determination paper, we noted that (coupled with constant demand) our fully-loaded demand assumption with instantaneous take-up was efficient because it resulted in a price that covered any piece-meal refurbishment, replacement, or expansion of the hypothetical efficient operator's network.

340. In response, WIK, on behalf of Spark and Vodafone, states that it fully supports the principal of a fully-loaded network assumption. Vodafone also, separately, provided its support for instantaneous demand take-up, as did Wigley and Company. We did not receive any submissions recommending an alternate approach to our position in our December 2014 UCLL draft determination paper.

341. We continue to hold the view that (coupled with constant demand) our fully-loaded demand and instantaneous take-up assumptions are efficient because they result in a price that covers any piece-meal refurbishment, replacement or expansion of the hypothetical efficient operator's network.

342. As we set out in the December 2014 draft determination, there are about 8,000 properties within the Residential Red Zone that are either vacant or will shortly be vacated (based on data from Corelogic NZ Limited). Once these properties have been vacated any remaining buildings will be demolished. Consequently, the UCLL demand within the Christchurch Earthquake Residential Red Zone area is deemed to be zero for the purposes of our modelling.

343. Attachment A provides a detailed discussion of how we have reached our further draft decisions regarding demand.

Deploying the modelled network

344. We propose that FWA should be considered part of the UCLL MEA.

345. In particular, we have used the current RBI FWA coverage areas to derive costs for service provision to end-users who currently receive only low-speed data or voice-only service. We have then applied these costs to voice-only and low-speed data end-users nationally, which equates to 40,833 end-user lines.

346. We note in this regard that we have modelled the deployment of FWA by deriving a cost in the cost model and applying it to selected end-users rather than physically modelling the position of the FWA sites. We consider that this best balances a number of competing concerns and difficulties which arise in the context of modelling FWA.

347. For the access model, we have modelled the following use of aerial in the network deployment:

347.1 45% of lead-in cables using aerial infrastructure; and

347.2 47% of distribution cables using aerial infrastructure.

348. The reasoning for this is:

348.1 We consider that the hypothetical efficient operator would deploy aerially to areas where there is existing aerial plant. Our view is that the existing EDB aerial infrastructure provides a reasonable starting point for our proxy for the areas where the hypothetical efficient operator would seek to deploy its network aerially.

348.1 We have therefore considered modelling aerially in areas where there is existing EDB aerial infrastructure. We have estimated this area to be approximately 49% of the UCLL network footprint based on data we have sourced from electricity distribution business (EDB) information disclosure.

348.2 We have also considered the LFCs' experience in deploying their UFB networks using existing aerial infrastructure, which indicates that the hypothetical efficient operator would not be able to fully utilise existing aerial infrastructure. Accordingly, we have made a downward adjustment of 2% to the percentage of aerial deployment for distribution cables and lead-in cables.

349. In our December 2014 UCLL draft determination we did not consider the possibility of the hypothetical efficient operator sharing underground infrastructure with utility companies. Therefore, underground infrastructure was not shared with utility companies. After reviewing submissions on this topic, we have concluded that infrastructure sharing is a relevant factor for the UCLL service.

350. We propose to include the following infrastructure sharing:

350.1 5% of underground infrastructure sharing with utility companies

350.2 FWA towers shared with two mobile operators

351. The main reasoning for this is:

351.1 the hypothetical efficient operator would deploy its MEA network to the most efficient degree of cost efficiency;

351.2 including infrastructure sharing in the model reflects what currently happens in New Zealand and overseas;

351.3 The FWA towers modelled are based on Vodafone's RBI-sites which are capable of hosting several base stations.

352. Attachment D provides a detailed discussion of how we have reached our further draft decisions regarding network deployment.

Determining the cost of the modelled network

353. Having decided how we will build the modelled network, we must decide how we will cost the elements that make up the network.

Asset valuation

354. Asset valuation is an important step in costing the network elements that are involved in supplying the regulated UCLL service.

355. There has been considerable divergence of views in submissions on the appropriate methodology to use for valuing assets, in particular civil engineering assets that are potentially re-usable and difficult to replace. A common example of such an asset is a duct. A number of regulators overseas have in recent years been moving towards valuing such assets on the basis of their historic cost.

356. For the purposes of this further draft determination, we have used optimised replacement cost (ORC) to value all assets used in our TSLRIC model for the UCLL

service. While we have explored a range of alternative asset valuation methodologies, we consider that ORC is consistent with our framework for carrying out the UCLL pricing review determination. In particular, ORC is aligned with the concept of the hypothetical efficient operator who builds a network that is unconstrained by historical decisions on the existing network that provides the regulated services.

357. We also consider that ORC is consistent with our TSLRIC objectives/outcomes, in particular encouraging efficient build/buy decisions, allowing for efficient cost recovery and incentivising the regulated entity to minimise its costs.

358. We have therefore applied ORC to all assets, including potentially re-usable civil engineering assets such as ducts.

359. Attachment E provides a detailed discussion of how we have reached our further draft decisions regarding asset valuation.

Weighted average cost of capital

360. We are required to set forward-looking cost-based access prices for the UCLL service using a TSLRIC methodology. The weighted average cost of capital (WACC is one of the key inputs to the TSLRIC models for UCLL, and represents the risk-adjusted return on capital employed in supplying the service.

361. We have determined a forward-looking post-tax WACC estimate of 6.03% for our UCLL further draft determination.

362. The parameters used to generate our mid-point post-tax WACC estimate of 6.03% for UCLL are summarised in Table 2 below.

Table 2: UCLL and UBA WACC estimate (as at 1 April 2015)

Parameter	Estimate for December 2014 draft	Estimate for July 2015 draft
Risk-free rate	4.19%	3.26%
Debt premium	1.85%	1.75%
Leverage	43%	37%
Asset beta	0.40	0.45
Debt beta	0.00	0.00
TAMRP	7.0%	7.0%
Corporate tax rate	28.0%	28.0%
Investor tax rate	28.0%	28.0%
Debt issuance costs	0.25%	0.25%
Cost of executing interest rate swaps	0.04%	0.08%
Equity beta	0.70	0.71
Cost of equity	7.92%	7.32%
Cost of debt	6.33%	5.34%
Post-tax WACC (mid-point)	**6.47%**	**6.03%**

363. The WACC is estimated as at 1 April 2015, which is approximately three months prior to the date of the further draft determination for UCLL. This was necessary to enable us to complete modelling and other work prior to finalising our further draft determination.

364. Compared to the December 2014 UCLL draft determination paper:

364.1 the risk-free rate has reduced from 4.19% to 3.26%, and the debt premium has reduced from 1.85% to 1.75%, to reflect current interest rates on government and corporate bonds as at 1 April 2015;

364.2 we have doubled the allowance for interest rate swap costs from 0.04% to 0.08%, reflecting the cost of executing two swaps rather than one;

364.3 we have increased the asset beta from 0.40 to 0.45, reflecting further analysis of asset beta estimates for Oxera's refined comparator sample, including updated data through to March 2015, and a decision by Oxera to revise upwards the top end of its recommended range for asset beta; and

364.4 we have updated our leverage estimate to reflect data over the most recent 10 year period, to be consistent with the approach to estimating asset beta. This has resulted in a decrease in leverage from 43% to 37%.

365. A detailed discussion of how we estimated the WACC percentage is set out in the Cost of Capital for the UBA and UCLL pricing reviews paper, published alongside our further draft determination paper.

Asymmetric risk

366. Our TSLRIC model for the UCLL service incorporates an allowance for certain asymmetric risks that are likely to be faced by the hypothetical efficient operator. We consider that an *ex ante* allowance for these asymmetric risks reflects the long-run forward-looking efficient costs that are likely to be incurred by the hypothetical efficient operator in respect of asymmetric risks.

367. Our further draft decisions and reasons in respect of asymmetric risks are:

367.1 to provide for an *ex ante* allowance for the asymmetric risk of catastrophic events, through the use of Chorus' insurance costs and other costs (including for seismic bracing and backup generation) which we consider (in conjunction with appropriate efficiency adjustments as discussed in regards to opex) are appropriate for the likely costs incurred by our hypothetical efficient operator to efficiently and prudently insure against catastrophic risk;

367.2 to provide for an *ex ante* allowance for the asymmetric risk of asset stranding due to technological change, by adopting Chorus' asset lives that we consider adequately take into account the risk of asset stranding;

367.3 to not provide any *ex ante* allowance for the asymmetric risks of asset stranding due to competitive developments, given that it is difficult to separate the risk of asset stranding through competitive developments from that of technological change, and we have already accounted for the former as discussed above; and

367.4 to not provide any *ex ante* allowance for the asymmetric risks of asset stranding due to future regulatory decisions regarding re-optimisation, as such asset stranding that is driven by technological change has already been accounted for, as discussed above.

368. Attachment F provides a detailed discussion of how we have reached our further draft decisions on asymmetric risk.

Depreciation

369. Depreciation determines the amount of its asset base that the hypothetical efficient operator can recover each year through the regulated access prices. As telecommunications networks, and in particular the UCLL service, are capital intensive, depreciation is a significant component of these services' forward-looking cost-based prices. Therefore, decisions about the choice of depreciation methodology and the inputs into the depreciation formula can directly affect these prices. In particular, these decisions can affect whether the hypothetical efficient operator's costs are recovered from current or future users of the hypothetical efficient operator's network.

370. Due to a combination of physical deterioration, technical obsolescence, and contract terms, most of the hypothetical efficient operator's network and related assets have finite commercially useful lives. As these assets age, their future productive capacity

and market value declines.[224] This loss of value is a cost that needs to be recovered over the life of these assets as part of the forward-looking cost-based prices charged for the service(s).

371. Changes in asset prices can also impact the depreciation included in forward-looking cost-based prices. This can occur due to factors such as inflation increasing the cost of comparable new assets (eg, wage inflation increasing the cost of laying cable) and technological development reducing the value of older assets.

372. Our further draft decision is to maintain the view that the tilted annuity method is the appropriate methodology for regulatory depreciation.[225] This approach combines an allowance for depreciation with the return on capital. We believe that tilted annuities are consistent with the principles of financial capital maintenance and provide efficient incentives for build-buy decisions over time.[226]

373. Attachment G provides a detailed discussion of how we have reached our further draft decisions on depreciation.

Asset lives

374. We have set asset lives to depreciate the hypothetical efficient operator's assets over their economic lives.

375. Our further draft decision remains that Chorus's asset lifetimes be used and adjusted, if required, based on international benchmarks, to depreciate the hypothetical efficient operator's assets over their economic lives. The main reasons for this are:

    375.1 we consider that this further draft decision is consistent with our framework for carrying out the UCLL pricing review determination, and is a reasonable estimation of the economic lives of the relevant assets of the hypothetical efficient operator for the purpose of TSLRIC modelling; and

    375.2 we consider the accounting asset lives provided by Chorus are an appropriate starting point for our asset lives draft further decision. We have used these as a proxy for the economic lives of the assets in our model.[227]

376. TERA then cross-checked these asset lives against TSLRIC models overseas. TERA selected international benchmarks where the asset lives provided by Chorus seemed

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224 Charles R. Hulten and Frank C. Wykoff (1996) "Issues in the measurement of economic depreciation: introductory remarks", *Economic Inquiry* 34, p. 10–23.

225 For calculating the hypothetical efficient operator's notional taxation, we have used diminishing value taxation.

226 Further discussion on tilted annuities and depreciation can be found in Van Dijk Management Consultations, "Evaluating Economic Depreciation Methodologies for the Telecom Sector", which can be found at http://www.vandijkmc.com/en/expertise_3.aspx.

227 Chorus provided a list of asset categories and its estimation of the corresponding lives, as required by our section 98 Notice. TERA has allocated all of the assets in the model into one of these categories and used the corresponding lives as the starting point. We reviewed TERA's analysis and agree with the conclusions.

out of line with what has been observed in other relevant jurisdictions, or if no data was provided. We reviewed TERA's analysis and agree with its conclusions.[228]

377. Attachment H provides a detailed discussion of how we have reached our further draft decisions on asset lives.

Price trends

378. Asset price trends in our model have been used to forecast costs, and have been applied with the tilted annuity depreciation. Price trends are necessary because we need to understand how the value of assets will change over time in order to construct our price path.

379. Our further decision is as follows:

379.1 For active assets using international benchmarks our decision remains that the Australian benchmark be used to determine price trends for active assets. We recognise that the Australian data is five years old. However, including Australia in the benchmark set provides a more representative benchmark set for New Zealand. If we were to exclude Australia, the benchmark set will only contain European countries.[229]

379.2 For passive assets using a cost escalation approach, the cost escalation approach can be summarised as follows:

379.2.1 We have selected the most relevant raw indexes and derived the long-term trend for each raw index.

379.2.2 The long-term price trend is then determined for each asset category based on a combination of the raw indexes and the composition of that asset category. For example, fibre optic cost consists of 70% of fibre cable cost and 30% labour costs. Given this, the price trend for fibre optic is equal to 30% multiplied by the trend for the labour cost index, plus 70% multiplied by the trend for the fibre optic cable index.

379.3 For passive assets, our further draft decision has changed from using compound average growth rates to using the average of annual growth rates to determine long-term price trends. The average annual growth rates are based on co-integrated relationships if the series has a stochastic trend. Our further draft decision is also to use the following price indexes and approaches to determine the long-term price trend for the following cost drivers when determining price trends:

[228] These assets include MDF/ODF and submarine links, and are further discussed in Attachment H.

[229] In the IPP benchmarking exercise, our benchmark set mostly comprised European countries and was based on comparability. In a TSLRIC modelling exercise we consider it would be appropriate to include Australian data in the benchmark set to determine prices trends for active assets.

Table 3: Price indexes and approaches to determine long-term price trends

Cost driver	Our further draft decision: Appropriate price index	Basis of price trend
Building costs	Capital Goods Price Index (CGPI) for non-residential buildings	Relationship to general inflation (1.9%)
CPI	Consumer price index (CPI)	Current requirements of the RBNZ's policy target agreement with the Minister of Finance (2%)
Wages/labour	Labour cost index (LCI) -all industries	Relationship to general inflation (2%)
Fabricated steel	A Statistics New Zealand Producer Price Index for Outputs of the metal fabrication industry (PPI-O)	Relationship to international steel prices, aluminium prices and domestic labour costs (2.9%)
Copper	London Metals Exchange (LME) prices for Copper	Average of historical growth and forecast based on LME futures plus Consensus Economics consensus forecasts (5%)
Fibre optic cabling	A US Bureau of Labour Statistics Producer Price Index (US PPI) for wholesale prices of Fibre Optic Cable	Historical trend including currency effects (-1.3%)

Source: Commerce Commission's own summary based on information provided by NZIER

379.4 Our further draft decision remains to use CPI as the default price index for other inputs where no data is available. Our further draft decision also remains using LCI for labour-related opex and for non-labour-related opex we use a stable price trend, ie, a price trend of 0%.

379.5 In relation to labour-related opex, our further draft decision is also to not allow for an additional adjustment for productive efficiency gains for opex related labour at this stage. The reason is that there is no convincing evidence to show what the adjustment for productivity efficiency should be, and we note that productivity efficiency gains could be greater or smaller than the productive efficiency gains already included in the LCI for all industries.

379.6 To convert foreign currency to New Zealand dollars, our further draft decision is to use the blended approach to convert foreign currency to New Zealand dollars. This approach was used in previous determinations for UCLL, UBA and SLU. This implies that if a series relating to tradable capital goods inputs only, we will use market exchange rates. For series with non-tradable components only, such as labour, we will use PPP rates only, and where we have a series related to both tradable capital goods inputs and non-tradable components, we will use an appropriate weighting between a PPP rate and a market exchange rate.

380. Attachment I provides a detailed discussion of how we have reached our further draft decisions on price trends.

Trenching costs

381. Trenching costs between the exchange and end-user are a significant factor in determining the cost of the access network.

382. We have sourced information regarding trenching and duct cost data from local costing experts Beca.[230] We consider that it is appropriate to rely on Beca's cost analysis for the calculation of trenching costs.

383. We have not included a discount for large scale roll-out on trenching costs. The main reasoning for this is that we do not consider it justified that the modelled hypothetical efficient operator, despite the scale of the network roll-out, would be able to get a discount which should be applied to Beca's trenching cost analysis.

384. Attachment J provides a detailed discussion of how we have reached our further draft decisions on trenching costs.

Capital contributions

385. We have considered and determined whether the hypothetical efficient operator would incur all of the capital costs of building the hypothetical UCLL network, or whether we should deduct some capital costs for some parts of the network because the hypothetical efficient operator would not incur those costs itself. Our view is that this cannot be considered entirely in the abstract, and as a result, we have been guided by real-world practice (in particular, that of Chorus, and its predecessor Telecom).

386. We have excluded costs for the following items from the TSLRIC calculation for the network:

386.1 trenches for all underground lead-ins; and

386.2 trenches for subdivisions built after 2001.

387. We have excluded these costs as, in our view, based on Chorus' practice, the hypothetical efficient operator would be able to claim these contributions directly from end-users or third parties, and the Act evidences a general intention that Chorus should not over-recover its costs. As the trench costs identified above have

[230] Beca is a professional service consultancy with a large presence in Asia Pacific including New Zealand. Beca delivers a variety of consultancy services across the buildings, government, industrial, power, transport and water market segments and consults to infrastructure providers.

been directly incurred by end-users, it would be inappropriate to allow for their recovery through the recurring charges produced by our TSLRIC model.

388. We have also excluded costs for infrastructure outside the TSO-derived boundary. In our view the hypothetical efficient operator would only connect end-users outside the TSO-derived boundary where it received a contribution.

389. Attachment K provides a detailed discussion of how we have reached our draft decision on capital contributions.

Tax

390. Our further draft decision is that that the TSLRIC-based price we derive will be a pre-tax amount. Given that the price we derive needs to be a pre-tax amount, our further draft decision is to adjust the tilted annuity capital charges for each type of asset by taking into account an appropriate tax depreciation rate. This is the same approach as presented in our December 2014 draft determination paper and July 2014 Regulatory Framework and Modelling Approach paper.

391. The reason for our further draft decision is to ensure that the result is not an inaccurate TSLRIC-based price due to an over estimation of the tax position of a hypothetical efficient operator which would occur if the tax model adopted a simple pre-tax calculation that assumed the corporate tax rate.[231]

392. Attachment L provides a detailed discussion of how we have reached our draft decision on taxation.

Operating expenditure

393. Our TSLRIC model calculates the operating expenditure (opex) associated with the provision of the UCLL service by our hypothetical efficient operator. Our further draft decisions and reasons in respect of opex are:

393.1 We start by utilising Chorus' financial accounts to determine the relevant opex for the UCLL service. We consider that Chorus' operating costs are the best objective evidence of opex for a nationwide telecommunications network provider in New Zealand;

393.2 We then scale down Chorus' opex by a factor of 40%, which we consider is the best available proxy for the likely lower opex that can be achieved on our hypothetical efficient operator's FTTH/FWA network as compared to Chorus' copper network; and

393.3 For maintenance opex in particular, we then apply an upwards adjustment to this opex category based on line fault indices, which we consider provides the best available proxy for the likely higher fault rates of our hypothetical

231 In New Zealand, a firm can reduce its taxation payments by deducting depreciation from the taxable earnings. This depreciation tax shield is computed as the amount of allowable depreciation multiplied by the tax rate. The use of accelerated depreciation methods during the early years of an asset's life will provide for a greater tax shield during the asset's early life and hence increase the NPV of the tax shield.

efficient operator’s FTTH/FWA network, which has a larger proportion of aerial deployment relative to Chorus’ copper network. We apply this maintenance opex adjustment after the 40% fibre opex adjustment to avoid the risk of double counting.

394. Attachment M provides a detailed discussion of how we have reached our further draft decisions regarding opex.

Cost allocation

395. The Act requires us to include a reasonable allocation of forward-looking common costs in our TSLRIC model for the UCLL service. We categorise forward-looking common costs into network costs (associated with common network elements, such as exchange buildings) and non-network costs (such as corporate overheads).

396. Our further draft decisions and reasons in regards to how we allocate forward-looking common costs in our TSLRIC model for the UCLL service are:

396.1 For network costs, we use a capacity-based allocation approach, with specific allocation keys identified for different categories of network costs. The capacity-based approach is an established approach in TSLRIC modelling, is more transparent than the alternative Shapley-Shubik approach, and is supported by our expert advisor TERA and all submitters. The relevant capacity-based allocation keys have been determined by TERA, which we consider are reasonable and provide a valid basis for allocating network costs; and

396.2 For non-network costs, we use the method of equi-proportional mark-up (EPMU), which (in its standard implementation) allocates costs in proportion to total attributable costs. This is an established approach in TSLRIC modelling, is relatively simple (compared to the alternative Ramsey pricing approach), and is supported by our expert advisor TERA and all submitters. We have implemented the EPMU approach as follows:

396.2.1 For the allocation of non-network costs between UCLL, UBA and other (for example, co-location and ancillary charges) services, we use modified EPMU based on each service’s share of revenue, as we consider that this is an appropriate implementation of EPMU when we do not have appropriate data to undertake a standard EPMU approach.

396.2.2 For the allocation of non-network costs within the regulated services (UCLL and UBA), we do have the appropriate data, and therefore use the standard EPMU approach based on each service’s share of total attributable costs.

397. Attachment N provides a detailed discussion of how we have reached our further draft decisions regarding cost allocation.

Chapter 3: Calculating the TSLRIC-based price for UCLL and SLU

Purpose

398. We must update each of the UCLL and SLU STDs prices. The UCLL STD relates to the unbundled copper local loop between the end-user and the exchange.[232] The SLU STD relates to the unbundled copper local loop between the end-user and the active cabinet.[233]

399. Having modelled the total annualised TSLRIC costs for the full local loop network, we need to ensure that they are mapped to prices to be included in the UCLL and SLU STDs.[234]

400. As the FTTH MEA we have chosen does not contain any active cabinets, a question arises as to how we translate the costs derived from the TSLRIC modelling process into a price for the UCLL and SLU services. The model itself will not produce separate costs for UCLL and SLU because the model does not equate to the current network that actually exists. Instead, it models the cost of a hypothetical, optimised network. Our model still reflects the basic functionality of the UCLL service, allowing the cost that is derived from the TSLRIC model to be subsequently mapped to the current UCLL and SLU STDs.

401. This Chapter sets out our further draft reasons for the approach we have taken regarding mapping costs to the UCLL and SLU services. In practical terms, this means allocating the TSLRIC monthly unit costs to UCLL and SLU services, in order to determine the prices with which to update the UCLL and SLU STDs.

402. In light of this, the purpose of this Chapter is to set out our approach to transforming the TSLRIC costs we have modelled for our hypothetical network into prices, in order to update the prices in the UCLL STD and SLU STD.

Overview of our approach to converting TSLRIC costs to prices

403. This section provides an overview of our approach to converting total annualised TSLRIC costs to prices for the UCLL STD and SLU STD. Our further draft decisions and reasons for each of our steps explained below are provided in detail in this Chapter.

404. We begin with the total TSLRIC annualised costs figures after we have allocated common costs and shared costs between other services. That cost allocation is discussed in Attachment N – Cost allocation.

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232 Commerce Commission "Standard Terms Determination for the designated service Telecom's unbundled copper local loop network" (7 November 2007), Decision 609.

233 Commerce Commission "Standard Terms Determination for the designated services of Telecom's unbundled copper local loop network service (Sub-loop UCLL), Telecom's unbundled copper local loop network colocation service (Sub-loop Co-location) and Telecom's unbundled copper local loop network backhaul service (Sub-loop Backhaul)" (18 June 2009), Decision 672.

234 We considered our framework with regard to TSLRIC objectives and our view is that TSLRIC objectives are not relevant in determining the prices, once we have determined our modelled TSLRIC costs. Our reasons for adopting our approach to convert TSLRIC costs to update STD prices are driven by s18.

405. To allow us to convert the annualised TSLRIC UCLL costs to monthly unit costs for UCLL and SLU we followed the following steps:

405.1 We first estimated the annualised TSLRIC costs for UCLL for each of the five years during the regulatory period. We also estimated the TSLRIC costs for the proportion of the UBA backhaul cost between the exchange and the active cabinet. (We will refer to this as the "fibre feeder" hereon.)[235]

405.2 To arrive at average monthly TSLRIC costs for UCLL and the fibre feeder for each of the five years, we then divided the annualised TSLRIC costs by 12, ie, the number of months in a year, and demand.

405.3 We then calculated the monthly unit TSLRIC costs for each of the UCLL and SLU services based on our aggregation approach explained in more detail in this Chapter and Attachment O – Implementation of aggregation.

405.4 We then set nominal monthly price for UCLL and SLU, for each year over the regulatory period.

406. The prices for UCLL and SLU based on our further draft decision are summarised in the table below.

Table 4: Nominal monthly prices for SLU and UCLL, (NZ$)

	Year 1	Year 2	Year 3	Year 4	Year 5
UCLL	26.74	27.18	27.63	28.09	28.56
SLU	11.66	11.79	11.92	12.05	12.19

Source: Commission's TSLRIC model for draft decision

Converting total annualised TSLRIC costs for UCLL and Fibre feeder to monthly unit TSLRIC cost

407. In this section we explain how we convert the total annualised TSLRIC UCLL costs to monthly unit TSLRIC costs for each of the five years of the regulatory period.

408. Table 5 below shows the total TSLRIC UCLL costs and TSLRIC cost for the fibre feeder for each of the years during the regulatory period. These figures are after we have allocated common costs and shared costs between other services, as discussed in Attachment N – Cost allocation.

[235] We determine the annualised costs for the fibre feeder, ie, the cost for the UBA backhaul between the exchange and the active cabinet, to allow us to allocate the TSLRIC cost of UCLL between SLU and UCLL. This further draft decision, reasons for our draft decision and approach is discussed in this Chapter. In its cross submission, Wigley and Company also stated that we treated cabinet fibre backhaul as SLU backhaul but they are not the same. This definition should clarify this point. See Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraph [13.15].

Table 5: Total annualised TSLRIC costs based on our TSLRIC model for ULL and fibre feeder, (NZ$, millions, nominal)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total TSLRIC costs for UCLL	457.55	464.57	471.71	478.99	486.39
Total TSLRIC costs for Fibre feeder	127.36	129.97	132.66	135.41	138.23

Source: Commission's TSLRIC model for draft decision

409. To calculate the monthly TSLRIC costs for each of the five years, we divided the annualised TSLRIC costs by 12, ie, the number of months in a year and the UCLL demand profile set out in Attachment A – UCLL network footprint and demand.

410. We also convert the total annualised TSLRIC costs for fibre feeder to monthly unit TSLRIC costs, because, as we explain further below, we require monthly fibre feeder costs to allocate the cost between UCLL and to SLU (we set out our approach to this cost allocation between UCLL and SLU in the subsequent sections of this Chapter and Attachment O – Implementation of aggregation).

411. We followed the same approach to convert the total annualised cost for fibre feeder to monthly unit costs. Where we divide by demand,[236] we use the number of UBA connections at an active cabinet. Table 6 below presents the monthly unit TSLRIC costs for fibre feeder, for each of the five years during the regulatory period.

Table 6: Monthly unit TSLRIC costs for the fibre feeder (NZ$, nominal costs)

	Year 1	Year 2	Year 3	Year 4	Year 5
Fibre feeder	15.08	15.39	15.71	16.04	16.37

Source: Commission's TSLRIC model for draft *decision*

412. As Table 6 above records, we have modelled a price for the fibre feeder (as part of the UBA FPP process). We remain of the view that the most appropriate way to derive the SLU price – consistent with our aggregation approach – is to use the fibre feeder price as an input to determine the relationship between UCLL and SLU.

Allocating total UCLL TSLRIC costs to UCLL and SLU services

413. Having modelled the TSLRIC UCLL costs, we need to ensure that they are mapped to prices to be included in the UCLL and SLU STDs.

We need to allocate the monthly unit TSLRIC cost of the unbundled local loop to determine prices for UCLL and SLU

414. We must update each of the UCLL and SLU STDs with prices. The UCLL STD relates to

236 We use the term "demand" in respect of SLU backhaul loosely – it is not intended to imply the final demand for the SLU backhaul service, but rather refers more generally to the relevant measure of output over which the costs of SLU backhaul lines are recovered.

the unbundled copper local loop between the end-user and the exchange.[237] The SLU STD relates to the unbundled copper local loop between the end-user and the active cabinet.[238]

415. As explained above and in our December 2014 UCLL draft determination paper, although our FTTH with FWA model determines the total cost of the full local loop network we must determine separate UCLL and SLU prices. Because our FTTH/FWA model does not include active cabinets, our model cannot distinguish between UCLL and SLU costs. This means we must find a way of deriving UCLL and SLU prices (to be included in the separate STDs) from our modelled cost of the full local loop.[239]

416. Accordingly, we use the modelled price of the backhaul component, and the modelled TSLRIC UCLL costs as the starting point for deriving the SLU price. We use the modelled price for the backhaul component as an input to determine the relationship between UCLL and SLU. This enables us to allocate the cost between the two services to update the STD prices for UCLL and SLU.

417. Our approach to determine the SLU price and cross checks of our implementation of the approach, are set out in Attachment O – Implementation of aggregation.[240] We refer to this approach as aggregation.[241] Aggregation is based on the principle that the price for UCLL = the price for SLU + the modelled TSLRIC price for the fibre feeder, ie, the cost of UBA backhaul between the exchange and the cabinet. We use a weighting approach between this formula (UCLL=SLU+ Fibre feeder) and another formula which calculates the average cost per line to connect all customers to the local loop.

Our further draft decision is to adopt a weighting aggregation approach to set prices for UCLL and SLU

418. There has been no change in our decision to aggregate since our July 2014 Regulatory Framework and Modelling Approach paper.

419. In our July 2014 Regulatory Framework and Modelling Approach paper we expressed our preference to set the same price for access between the end-user and the exchange, irrespective of whether the line is cabinetised or non-cabinetised.[242]

420. In our December 2014 UCLL draft determination paper, our draft decision was to

[237] Commerce Commission "Standard Terms Determination for the designated service Telecom's unbundled copper local loop network" (7 November 2007), Decision 609.

[238] Commerce Commission "Standard Terms Determination for the designated services of Telecom's unbundled copper local loop network service (Sub-loop UCLL), Telecom's unbundled copper local loop network colocation service (Sub-loop Co-location) and Telecom's unbundled copper local loop network backhaul service (Sub-loop Backhaul)" (18 June 2009), Decision 672.

[239] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [379-380].

[240] We note that notwithstanding our approach to aggregation, we are not changing the SLU backhaul price.

[241] Aggregation means setting the same price for access between the end-user and the exchange, irrespective of whether the line is cabinetised or non-cabinetised

[242] Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" (9 July 2014), paragraphs [205-206] and [218].

adopt an aggregated approach to set prices for UCLL and SLU. Our decision was that an aggregated approach to map costs to services would best promote our section 18 purpose statement.[243]

421. Most submissions in response to our December 2014 UCLL draft determination paper agreed with our aggregation approach to set prices for UCLL and SLU. For example, Chorus, in its cross submission stated that no party took serious issue with the proposed aggregation approach.[244]

422. However, Wigley and Company argued that an aggregation approach is not legally open to us, and we need to determine the TSLRIC-based prices for UCLL and SLU on a stand-alone basis.[245]

423. We have considered the Wigley and Company submission but disagree that we must calculate standalone TSLRIC prices for UCLL and SLU. Adopting that approach would lead to prices which, when combined, would differ from the prices derived from an aggregation approach. In our view, such an approach would be unlikely to best give effect to the section 18 purpose statement for the following reasons:

423.1 Separate prices leads to a price difference between cabinetised and non-cabinetised lines that is not cost-justified. Such a difference is unlikely to provide uniform incentives for unbundling (unless the UBA price is also differentiated between cabinetised and non-cabinetised lines).[246] This may materially discourage sub-loop unbundling where it would otherwise be efficient to do so, which is inconsistent with our section 18 purpose statement.

423.2 Aggregation gives best effect to the relativity requirement in the Act by ensuring that unbundlers are faced with the relevant unbundling costs in both the cabinetised and non-cabinetised settings, rather than prices being distorted by different access prices. Aggregation ensures that unbundling is incentivised where it is efficient to do so, and not incentivised where it would be inefficient to do so, which promotes competition for the long-term benefit of end-users.

423.3 An aggregated approach is more likely to promote competition in the long-term benefit of end-users. This is because there is a danger that disaggregated prices may adversely impact on retail prices. Separate UBA

[243] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [388].

[244] Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL 20 March 2015, paragraph [245-246]. Chorus did indicate that if we depart from this approach, it will be necessary to consider implications on other issues. We agree and note this.

[245] Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraph [13.10-13.12] and [13.20].

[246] The UBA price on cabinetised lines would reflect sub-loop backhaul costs where as those costs would be excluded from non-cabinetised lines.

prices raise the danger that the higher priced service may act as a cost floor to retail pricing where, as appears to often be the case, access seekers are constrained in differentiating their retail prices, ie, between cabinetised versus non-cabinetised lines.

424. Accordingly, for the above reasons, we are satisfied that the aggregation approach we have taken is most likely to promote competition in the long-term benefit to end-users.

Our weighted aggregation approach

425. Our aggregation approach remains the same as the aggregation approach explained in our December 2014 UCLL draft determination paper. This approach is explained and set out in Attachment O – Implementation of aggregation of this further draft determination.

426. WIK supports aggregation in principle but disagreed with our approach and argued that it leads to double or over recovery.[247] In its submission, it seemed that WIK claimed that our aggregation approach leads to potential double recovery.[248] Wigley and Company, in its cross submission, agreed with WIK that fibre backhaul is included in UCLL.[249]

427. The submission was unclear, so we requested WIK to explain its concern at the FPP conference. In response to the question, WIK provided a further document to explain its concern about our aggregation approach.[250] In our view, WIK's concern is not about any double recovery or any over-recovery but rather a concern of "cross-subsidy"[251] between UCLL and UBA. This is due to the fact that the aggregation approach that we are following includes the fibre feeder in UCLL as UCLL = SLU + fibre feeder, and not in UBA.

428. We disagree with WIK. We are simply using the modelled TSLRIC fibre feeder costs to establish the relationship between the SLU and UCLL costs, which are derived from the total TSLRIC cost for UCLL. So, the use of the fibre feeder is notional for cost allocation purposes only and that we ensure the total costs recovered are for the local loop only. In conclusion, we are not including the cost of fibre feeder in UCLL.

429. Our further draft decision therefore remains adopting a weighting aggregation approach to set prices for UCLL and SLU.

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247 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraphs [172-176].

248 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [172-179].

249 Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraph [2.33-2.35]

250 WIK-Consult "Coexistence of copper and fibre in the feeder" 12 May 2015.

251 Ibid, p. 49.

Other issues raised in submissions related to our aggregation approach

430. Chorus submitted that the UCLFS cost is higher than that for UCLL.[252] We accept that the TSLRIC cost between UCLFS and UCLL may vary but the prices for UCLL and UCLFS are the same.

431. The Act links the price of the UCLF service to the prices we set in this pricing review determination. This was explained in more detail in our December 2014 UCLL draft determination paper. In particular:[253]

> We consider that, at the time of the 2011 amendments, the word "full" was an established industry term of art used to refer to the full-loop service of UCLL (that is, the loop from the end-user to the exchange on non-cabinetised lines) as opposed to the sub-loop service of SLU between the end-user and a cabinet. This is, for example, the terminology used throughout our SLU STD in 2009. We consider that if Parliament had intended a more significant change – that is, the introduction of a new concept of a full-UCLL price that includes both cabinetised and non-cabinetised lines – then this would have been more clearly expressed in the Act and would have been discussed in the legislative history.
>
> Further, we consider that setting a price for the UCLF service equal to the price in the UCLL STD fits better with the rest of the Act and is more likely to give effect to the section 18 purpose statement. That is because setting different prices for the UCLF service and for UCLL STD service could lead to arbitrage. If the price for the UCLF service was greater, RSPs could buy the UCLF service on cabinetised lines and buy the UCLL STD service on non-cabinetised lines, but Spark could not have that advantage during the period it is prohibited from purchasing any UCLL service. In our view, we should, as a general principle, read the words of the Act as being consistent with the section 18 purpose statement.[254]

Our monthly TSLRIC unit costs determined for UCLL and SLU

432. Table 7 below shows the monthly TSLRIC unit costs determined for UCLL and SLU based on our aggregation approach as explained in the previous sections.[255] [256]

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[252] Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL 20 February 2015, paragraph [194].

[253] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [116-117].

[254] Chorus v Commerce Commission [2014] NZCA 440 at [153].

[255] We note that this method of aggregation has resulted in a negative price for SLU in non-urban areas. In this respect we note that such a price is never actually applied as we are required to geographically average prices.

[256] When we first determined a STD for SLU (and other sub-loop services) in June 2009, we set the price for SLU based on a benchmarked proportion of 60.4% of the full-UCLL price. When we re-determined SLU prices in December 2012, we also applied the 60.4% proportion of sub-loop to full-loop prices to determine the SLU price. By way of comparison, the SLU prices that we set out in Table 6 are approximately 43%-44% of the UCLL prices in Table 6 (with the exact percentage depending on the relevant year of the regulatory period being considered).

Table 7: Monthly unit TSLRIC costs (NZ$, nominal costs)

	Year 1	Year 2	Year 3	Year 4	Year 5
UCLL	26.74	27.18	27.63	28.09	28.56
SLU	11.66	11.79	11.92	12.05	12.19

Source: Commission's TSLRIC model for draft decision

Price profile

433. Our further draft decision is to set different prices for each year over the regulatory period. We explain below why it would be more appropriate to set different prices for each year over the regulatory period.

Our December 2014 draft decision and views of submitters

434. In the December UCLL draft determination paper, our draft decision was to set a constant levelised (nominal) price over the regulatory period, as we considered that to do so would provide price stability over the regulatory period. [257]

435. We also provided our levelising formula in the December 2014 UCLL draft determination paper. We considered that this formula provided for both stable prices and cost recovery.[258] We illustrated in the December 2014 UCLL draft determination paper that the effect of setting a constant levelised price over the regulated period is that prices are higher in the earlier years of the regulatory period and lower in the later years, relative to an approach where prices are not levelised.[259]

436. In response to our December 2014 UCLL draft determination paper, submissions generally did not support this approach. WIK submitted that a constant price path can distort competition and efficient choices across time. WIK also submitted that this approach can be disruptive to the market at the beginning and end of the regulatory period.[260] CallPlus submitted that a constant levelised price is not to the long-term benefit of end-users, and is further compounding the problem for unbundlers by effectively increasing the price they pay in years 1 and 2 of the regulatory period.[261]

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[257] Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [365-376]; Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" (9 July 2014), paragraphs [259] and [260].

[258] Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [375].

[259] Ibid, at paragraph [365-376].

[260] WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [91].

[261] CallPlus "Submission on the Commerce Commission's Draft determinations for UBA and UCLL services" CONFIDENTIAL 20 February 2015, paragraph [58-63].

437. At the conference, Chorus indicated it had a “slight preference” for our draft decision to set a constant levelised price over the regulatory period. Chorus stated that setting constant levelised prices is a pragmatic approach that will provide stability over the regulatory period.[262]

Our further draft decision is to set nominal prices for each year over the regulatory period

438. Upon further consideration of the issue and submissions we are changing our December 2014 UCLL draft decision.

439. Our further draft decision of the issue and submissions, we consider that it is appropriate to set different prices for each year. This represents a change from the constant levelised price set in our December 2014 UCLL draft determination paper.

440. We note that both approaches, ie, setting a constant nominal price or different prices for each year over the regulatory period, are equivalent in net present value (NPV) terms. That is, the stream of cash flows arising from a constant levelised price has the same NPV as the stream of cash flows arising from the increasing nominal prices over the regulatory period.

441. We have decided to move away from constant nominal prices because using a price path based on nominal prices for each year over the regulatory period would result in price increases being delayed towards the end of the period. On the other hand, setting different prices over the period is likely to mitigate the effect of a significant price shock in year 1. To avoid such price shocks, we consider it is appropriate to set a price profile of different prices across the regulatory period.

442. To implement our preferred approach we factored in the effect of price trends on the network build. Our TSLRIC model uses network costs that were collected in 2014, and assumes that the network build started in 2014 and took approximately six months. However we anticipate issuing our final decision in December 2015. To account for this timing difference, the prices shown as year one in our price path have factored in a year’s price trend (hence year one in our price path is the second year in the TSLRIC model).

Cross-checks on the level of TSLRIC prices

443. Spark has provided a comparison of the draft TSLRIC prices for the UCLL service with international benchmarks and submitted:[263]

[262] Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p.283.

[263] Spark “UBA and UCLL FPP pricing review draft decision submission”, 20 February 2015 paragraph 14, p. 9. Several other submitters have also referred to this comparison for example Wigley and Company “Cross submissions as to draft UCLL and UBA FPP determinations” 20 March 2015 paragraph 1.1(a) and Vodafone New Zealand Limited “Cross Submission to the New Zealand Commerce Commission” 20 March 2015 paragraph (v). Chorus has submitted this evidence should be rejected (Chorus, “Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus’ Unbundled Copper Local Loop and Unbundled Bitstream Access Services”, 20 March 2015, paragraph 5).

> These facts, and the magnitude of the divergence from past estimates and overseas prices – which would have the effect of transferring between $500 million and $1.5 billion dollars from New Zealand end-users to Chorus over the course of the next five years – should have been sufficient to cause the Commission to delve more deeply than it has into the reasons for this divergence and to think more carefully about making the number of decision it has to favour predictability and investment incentives over lower prices. Surprisingly the draft determinations do not comment on or explore the significant divergence from previous pricing estimates, and international experience.

444. Having considered the evidence provided by Spark and the evidence collected in previous IPP benchmarking exercises, we have found that our draft prices are within the broad range indicated by the full set of relevant international comparator data we have available.[264] We note that we have significant concerns in the ability of any of the available comparator data to act as a cross-check on the FPP modelling. Nonetheless, having considered this evidence we do not believe it leads us to take any other action.

445. Given the FPP is being determined as a process which involves modelling New Zealand specific costs as a requested alternative to the existing IPP based on international comparators, such comparators have a limited role to play in the FPP.

446. This concern is highlighted in the case of the UCLL price, whereby our IPP process found only one comparable country, Sweden and therefore had to use alternatives to our previous benchmarking methodology in order to determine a price.[265] In particular the 2007 issue of US comparators being significantly higher than other comparators, and whether New Zealand costs are more akin to US costs or not, is masked by using currently available data which will exclude the US States. The lack of US comparators in the Spark dataset is a significant drawback to its use as a cross-check on the draft FPP prices.

447. We have requested TERA examine the New Zealand model against other regulatory decisions for which public information is available.[266] These comparators are Ireland, France, Denmark and Sweden.[267] TERA has advised us the main factors driving different costs for New Zealand are the spatial dispersion of end-users driving a higher network length per line and, for comparison with Sweden and Denmark, higher trenching costs. In effect, customers in New Zealand tend to be more spread out and thus it costs more to provide the infrastructure to reach them. Even for Sweden which, on a national basis, has a similar population density to New Zealand, population is not so dispersed there.[268] TERA has found that the network length per line is 64.3 metres for New Zealand compared to 41.2 for France, 51.2 for Sweden and 55 for Denmark. For trenching costs, we have sought and received local civil

[264] We have limited our considerations here to the usefulness of available data and evidence as a cross-check rather than repeat the IPP exercise, as the FPP for the UCLL service is TSLRIC.

[265] In this IPP we used both benchmarking the change in regulated prices and econometrically adjusting benchmarks to improve comparability.

[266] See TERA, "International comparison of TSLRIC UCLL and UBA costs and prices", June 2015.

[267] While the French regulator does not use a TSLRIC model to set prices and, consequently, the regulated price is not comparable to our TSLRIC estimate, there is a TSLRIC model available for France.

[268] The intuitive story for this is Sweden has large areas where no one lives.

engineering experts, Beca, for advice on the expected costs for New Zealand. While the modelled average trenching costs are higher in New Zealand ($85 per metre) than Sweden (52) or Denmark (34), New Zealand trenching costs are lower than for France (88).

448. Attachment Q – International comparators of this draft determination provides our analysis of international comparators.

Chapter 4: Price adjustments for UCLL and SLU

Purpose

449. In this Chapter, we set out our consideration of the following:

449.1 Whether the central estimate of the TSLRIC price for the UCLL service is likely to best give effect to the section 18 purpose statement, or whether a departure from the central estimate might be justified.[269]

449.2 Whether a specific adjustment should be made to the mid-point estimate of the weighted average cost of capital (WACC) used to determine the TSLRIC price for the UCLL service.[270]

449.3 Whether a specific adjustment should be made to the central estimate of the TSLRIC prices for the UCLL and UBA services to give effect to the relativity requirements of the Act.

450. Relativity is an important part of this, given that it is a mandatory consideration under the Act. This is considered last as it is relativity between the prices we are intending to apply which matters.

451. Our main considerations on moving from the central estimate of the TSLRIC price or the mid-point for the WACC relate to asymmetric costs of under- or over-estimation. Where possible, we have sought to quantify such effects. We have engaged independent expert academic and consultancy support in doing this and we have consulted on a proposed quantification framework, as discussed further below.

452. We note that we have considered adjustments to the TSLRIC-based price for the UCLL service, and a specific adjustment to the WACC, which is one of the parameters used to estimate the TSLRIC-based price. Our analysis of a TSLRIC price adjustment focusses on the migration effects of such an adjustment, as the UCLL price is likely to directly affect retail prices for copper-based services, which in turn will influence substitution between copper and fibre. Our specific consideration of whether the WACC parameter should be adjusted focusses investment effects, and in particular investment in innovative new telecommunications services, due to the potential signal our decision regarding the allowed WACC may send to investors in telecommunications services more generally.

Our further draft decision

453. Based on the quantitative analysis that we have undertaken, the submissions received on that analysis, and our consideration of other relevant contextual factors, our current view is that no adjustment should be made to either our central estimate of the TSLRIC-based price for the UCLL service or our mid-point WACC estimate.

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269 By “central estimate”, we mean the unadjusted estimate that is produced by our TSLRIC model.

270 The discussion of a WACC uplift below is a summary of a more detailed analysis which appears in the separate cost of capital report for the UCLL and UBA pricing reviews, which has been released with this draft determination.

454. Our draft decision is that the central estimate of the TSLRIC price for the UCLL service is likely to best give effect to the section 18 purpose statement. Having considered the potential consequences of increasing the regulated price of the UCLL service above our central TSLRIC estimate, we consider that such an uplift would not promote competition for the long-term benefit of end-users.

455. We also consider that it is appropriate to use the mid-point estimate of the WACC for the purposes of determining the TSLRIC price for the UCLL service. In our view, the linkage between a WACC uplift and incentives to invest is not sufficiently robust to support an uplift in this case.

456. On relativity, we continue to be of the view that we should be neutral towards the promotion of unbundling. We do not propose to make any adjustment to our central estimates of the TSLRIC-based prices of the UCLL and UBA services on the grounds of relativity.

Why have we been considering an uplift?

Estimating TSLRIC prices is uncertain

457. As we have explained in Chapter 1, we are directed by the Act to determine a TSLRIC-based price for the UCLL service. The nature of a TSLRIC modelling exercise means that we have had to make a number of judgement calls as to how the service should be modelled and the parameters that should be used. We note in this regard that TSLRIC modelling is subject to a considerable degree of uncertainty and that for any given decision there is likely to be a range of options upon which reasonable people may disagree. We have provided further details on our judgement and views on modelling decisions throughout this consultation process.

458. We also consider that there may be asymmetric effects from mistakenly over-estimating the regulated price versus under-estimating the regulated price. In particular, the costs of setting a regulated TSLRIC price that is too high would include the welfare losses to end-users from higher retail prices for copper-based services. The costs of setting a price that is too low could include slower migration to fibre-based services and potential losses arising from less investment in innovative new services.

459. Given this asymmetry and the uncertainty inherent in estimating a TSLRIC-based price, we have further examined the potential welfare consequences of moving from our central estimate of the TSLRIC price for the UCLL service and our mid-point WACC estimate. This assessment has included an attempt to quantify the changes in welfare that could arise from an uplift to either the WACC or the TSLRIC price that is produced by our model.[271] We have engaged a number of international experts to

[271] A number of submissions on the December 2014 draft determinations argued that we should try and quantify these welfare effects. For example, Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [112].

assist us in this exercise, and have separately published their reports along with this draft determination.[272]

460. The quantitative analysis that we have conducted, and which is further described below, has been an important element in developing our view on whether an uplift is likely to give best effect to section 18. In addition, we have had regard to a number of contextual considerations which we believe should be taken into account when considering the case for any uplift. These are also set out in the following sections.

461. We have not explicitly modelled a move below our central TSLRIC estimate or WACC mid-point, as we continue to be of the view that in the current case, setting a regulated price below what we expect to be the TSLRIC of supplying the UCLL service is unlikely to best give effect to the section 18 purpose statement of the Act. This is because setting such a regulated price will not by definition allow for the recovery of the efficient forward-looking costs of supplying the UCLL service, and is therefore, likely to send a strong negative signal for investment in new network infrastructure in the future. In addition, setting a regulated price that is below our central estimate is likely to distort demand and slow migration to fibre.

We have not derived a plausible range of TSLRIC

462. The final output of the model represents our central estimate of the forward-looking TSLRIC for the UCLL service. In other words, the final output reflects the various modelling choices, many of which have a range of reasonable options. For this reason, we consider that there is more than a single reasonable TSLRIC for the UCLL service. Any assertion that a TSLRIC modelling exercise automatically produces the "true TSLRIC" is misconceived. Accordingly, in the present context, we consider our TSLRIC output as a central estimate that lies within a "plausible range".

463. We note that actually quantifying such a plausible range would be a very complicated and ultimately uncertain process. In particular, this could involve modelling a large number of combinations of different modelling choices and consolidating those into some kind of range. Even then, the nature of some of those modelling choices means that this could not be sensibly achieved.[273]

464. For example, CEG has suggested that we consider the use of Monte Carlo simulation to address uncertainty in the estimation of TSLRIC prices.[274] In our 2 April 2015 pre-conference paper, we noted that such an approach is informationally demanding and that it was unclear how such an approach might be applied in the context of

[272] See Vogelsang, I. "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015; Cambini, C. "Potential welfare gains and losses from an uplift to copper prices: A Reply to Companies' comments" 19 May 2015; Cambini, C. "Economic aspects of migration to fibre and potential welfare gains and losses from an uplift to copper prices" 16 March 2015; Dobbs, I. "Welfare effects of UCLL and UBA uplift: Comments on the Application of the Dobbs 2011 model" 29 May 2015; and Oxera "Is a WACC uplift appropriate for UCLL and UBA?" June 2015.

[273] An example is the modelling choice relating to the selection of the MEA.

[274] CEG "Uplift asymmetries in the TSLRIC price" February 2015, Section 6.

individual parameters such as an asset life or unit costs, where the sample of observations might be relatively small. [275]

465. Professor Vogelsang has also raised concerns, which we share, over the implementation of CEG's proposal:[276]

> My only comment on CEG's section 6, which covers a suggested empirical approach via Monte Carlo simulations, is that it appears to be totally unworkable in the current proceeding. It would require probability assessments for various parameters that are not available at all.

466. Although for the above reasons we have not attempted such a quantitative approach, we consider that our central estimate of the TSLRIC price sits within a plausible range, and we believe that it is appropriate to consider whether there are good reasons to move away from this central estimate. In particular, we would need to be satisfied that moving away would best meet our section 18 duty to promote competition in telecommunications markets for the long-term benefits of end-users of telecommunications services.

467. We have therefore considered the potential welfare consequences of over- or under-estimating the TSLRIC price.

What is it we are trying to measure

468. In considering whether there is a case for a potential uplift, we have focussed on the incremental benefits and costs to end-users of telecommunications services that could reasonably be attributable to the uplift. In his review of submissions on the December 2014 draft determinations, Professor Vogelsang noted that it is the incremental benefits and costs arising from an uplift which are important:[277]

> Hausman seems to suggest that the benefits from the deployment of high-speed broadband (such as the UFB) are at stake; but irrespective of what the Commission decides on the uplift question, the UFB is committed and hence the benefits from UFB will emerge anyway. Relevant would be the innovation effects that could be attributed to the uplift, not the aggregate innovation effects that would occur anyway.

469. The potential welfare losses arising from an uplift to the UCLL price would be in the form of higher retail prices for copper-based services. Such losses would flow in a relatively direct manner from any uplift and would rely primarily on the extent to

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275 Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 2 April 2015, from paragraph [93].

276 Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [97]. Houston Kemp has also noted that CEG's proposed approach would rely on probability distributions for these input variables, and if such were not available, "the value of undertaking a Monte Carlo exercise will be greatly reduced." Houston Kemp "Comment on the Commerce Commission's paper: Agenda and topics for the conference on the UCLL and UBA pricing reviews" 11 May 2015, p. 38.

277 Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [3].

which the uplift (either to the TSLRIC price or to the WACC) is passed through into the retail prices paid by end-users.

470. In terms of the potential welfare benefits from an uplift, we have considered a range of possible benefits, including:

470.1 faster migration of customers from copper to fibre, which could generate consumer benefits in the form of positive network externalities;[278]

470.2 improve quality of service;

470.3 expansion of existing networks; and

470.4 investment in innovative new telecommunications services.

471. In terms of what we are measuring in this context, we note that section 18 directs us to consider both consumer and total surplus.[279] Total surplus is relevant where it incorporates long-term benefits to end-users not otherwise captured. In practice, we are not convinced, in the quantitative models provided, that the differences between the total welfare and consumer welfare estimates were due to factors other than a transfer of wealth from consumers to producers. This leads us to the view that the consumer welfare standard is appropriate in this case. This is consistent with the approach that we have taken in the regulation of electricity lines and gas pipelines businesses.[280] We note that the Commission has previously had regard to both consumer welfare and total welfare.

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278 Network externalities refers to the increased utility enjoyed by other subscribers from having additional subscribers join the network. In the case of migration to fibre, such network externalities might arise from being able to communicate with a wider customer base using services that are supported by fibre, or to the extent that higher penetration of fibre stimulates more innovative applications over fibre.

279 Further discussion regarding whether a consumer or total welfare standard should be used is contained in the separate WACC report released with this further draft determination. Commerce Commission "Cost of capital for the UCLL and UBA pricing reviews: Further draft decision" 2 July 2015, paragraphs [235] to [241].

280 Commerce Commission "Amendment to the WACC percentile for price-quality regulation for electricity lines services and gas pipeline services, Reasons paper" 30 October 2014, Attachment A. We acknowledge that the purpose statement for Part 4 of the Commerce Act differs slightly from that of the Telecommunications Act.

472. We also note that it is the long-term benefits to end-users of telecommunications services which are relevant. In this regard, while there may be wider economic benefits and costs (such as the impact of fibre adoption on economic growth), we have focussed on the direct welfare consequences for end-users of telecommunications services. We also note that this view is conceptually supported by Professor Vogelsang in the context of the UBA:[281]

> Spillover effects from UFB investments come in two forms. Most direct are spillovers in the form of network effects on new applications that directly benefit the UFB subscribers. Such effects are not taken into consideration in the subscription decisions of potential new subscribers, leading to too few subscribers. In contrast, more indirect spillovers affect the economic growth of a country via improvements in productivity and the like. While one can argue that the latter indirect latter effects should be the concern of the central government, a case can be made for the former direct effects to be the concern of the Commerce Commission both with respect to the LTBEU and efficiencies gained for the telecommunications sector. As a result innovation incentives and risks faced by investors could potentially justify a UBA price above the true cost. In contrast, a UBA price below true cost has to be seen as conflicting with the goals of s 18.

473. The network effects to which Professor Vogelsang refers are the effects that we have attempted to identify in our consideration of a potential uplift to the TSLRIC price, which are further discussed below.

Can we consider an uplift?

474. Some submitters have contended that we do not have discretion to move away from the central estimate in order to promote migration to fibre. For example, Spark argued that the Commission’s task is to determine a TSLRIC price for the regulated service, and that the Commission does not have the power to apply a separate uplift to promote migration to fibre.[282] Wigley and Company also submitted that the Commission’s legal obligation is to determine the “true” TSLRIC and not to set a different price for non-cost reasons (such as to promote migration to fibre).[283]

475. According to Vodafone, an uplift above TSLRIC costs is inconsistent with the Commission’s task under section 18 of the Act,[284] which is best served by the Commission setting UCLL and UBA prices at the Commission’s central estimate of TSLRIC. Vodafone argued that any adjustment to the TSLRIC price must be based on strong and compelling evidence that such an adjustment is necessary to promote

281 Ingo Vogelsang “What effect would different price point choices have on achieving the objectives mentioned in s 18, the promotion of competition for the long-term benefit of end-users, the efficiencies in the sector, and incentives to innovate that exist for, and the risks faced by investors in new telecommunications services that involve significant capital investment and that offer capabilities not available from established services? - Paper Prepared for the New Zealand Commerce Commission” 5 July 2013, paragraph [56].

282 Spark “Analytical framework for considering an uplift to FPP prices” 11 May 2015, paragraphs [8], [16].

283 Wigley and Company “Commentary on behalf of consumer interests on Commerce Commission paper dated 2 April 2015 as to TSLRIC and WACC uplifts” 13 April 2015, paragraph [2.9].

284 Vodafone “Submission to the Commerce Commission on Commission paper: Analytical Frameworks for considering an uplift to the TSLRIC price and/or WACC” 11 May 2015, paragraph [iii].

competition for the LTBEU and that the magnitude of adjustment made will achieve that outcome.[285]

476. Vodafone also noted that the Commission has previously rejected arguments by Chorus to prioritise migration to UFB (under section 18(2A)).[286]

477. Network Strategies, for Spark and Vodafone, argued that the role of regulatory pricing is to set efficient prices under the TSLRIC approach, whereas the issue of uplifts to achieve policy goals is the role of the policy maker.[287]

478. We do not agree with submitters in this regard, due to the potential asymmetric effects from over-estimating versus under-estimating the regulated price. If the evidence demonstrates that incentivising migration to fibre (by way of moving to a different point within a plausible range) would promote competition in telecommunications markets for the long-term benefits of end-users of telecommunications services, then, the Commission has the discretion to make this adjustment. Indeed, some submitters have acknowledged the wider point that adjustments can be made to the TSLRIC estimate if it would best achieve the section 18 purpose. It is unclear to us why they have sought to “carve out” migration benefits from this wider point. Doing so unduly limits the application of section 18, which applies to “telecommunications markets” and “telecommunications services” as a whole.

479. Our view remains that the potential for an uplift to promote migration to fibre is a relevant consideration which could achieve the section 18 purpose. As noted by Vodafone, in our UBA IPP determination, we previously disagreed with Chorus that section 18(2A) requires us to prioritise migration to UFB. However, we also noted that we had elaborated on our thinking in relation to dynamic efficiency, migration, and section 18(2A) in the UBA IPP update paper:[288]

> We use ‘migration’ as a summary term to describe the dynamic efficiency features of the UFB, embracing network effects and the critical mass of end-users that will help promote development and uptake of new applications, software, and content (innovative services).
>
> While we recognise that many of the applications that will drive take-up of UFB are already available internationally, we consider there are still potentially important applications, content and services where introduction into the New Zealand market will depend on when a threshold take up of UFB is reached.
>
> The Government is providing a substantial subsidy for the UFB, which may address the risks facing LFCs in the delay between the capital investment in the UFB and the build-up of end-users and revenue. However, even if the subsidy addresses these risks, there remains a direct benefit to end-users from accelerated migration where that would bring forward availability

285 ibid, paragraph [C1.12].
286 ibid, paragraph [C2.4].
287 Network Strategies “Analytical frameworks for an uplift to the TSLRIC price and WACC” 11 May 2015, Section 2.
288 Commerce Commission “Unbundled Bitstream Access Service Price Review - Update on matters relevant to the UBA price review” 13 August 2013, paragraphs [123-125].

of highly valued innovative services (ie, the subsidy may not fully internalise the benefits of accelerated migration).

480. We consider that the effects that we described in the UBA IPP update paper as being relevant considerations when determining the price for the UBA service under the IPP remain relevant in the current context. The key issue that we have been considering is whether an uplift might be justified based on an assessment of the welfare consequences of an uplift.

481. In the following sections, we set out our consideration of the welfare consequences of a potential uplift and whether such an uplift is likely to promote competition for the long-term benefit of end-users.

Consideration whether our TSLRIC estimate best gives, or is likely to best give effect to the section 18 purpose statement

What we said in the December 2014 UCLL draft determination paper

482. In the December 2014 UCLL draft determination paper, we decided that the unadjusted central estimate of the TSLRIC price was likely to best give effect to the section 18 purpose statement.[289] We stated that an uplift would not be appropriate, as the cumulative impact of a number of modelling decisions had provided a central estimate of a TSLRIC price which mitigated any concerns over asymmetric costs.[290] We noted that such an asymmetry could arise as the costs of mistakenly setting a TSLRIC price that is too high would include the welfare losses to end-users from higher retail prices for copper-based services, although a price that is too low could slow migration to fibre-based services, which would defer potential welfare benefits arising from such services.[291]

483. While our preliminary view, based on a qualitative assessment, was that our central estimate of TSLRIC did not require a further uplift to account for such asymmetries, we noted that it would be open to us to consider an uplift to the TSLRIC price in light of submissions on the December 2014 UCLL draft determination.[292]

484. We also referred to advice received from Professor Ingo Vogelsang on whether an uplift to the UCLL price might be warranted.[293] Professor Vogelsang concluded that an uplift on the UCLL price was unlikely to promote competition for the long-term benefit of end-users, although it may create positive network externality effects on other networks and that these effects for UFB subscribers were likely to outweigh any negative externality effects on the remaining copper subscribers.

485. We were not persuaded by arguments by CEG that an uplift would promote competition for the long-term benefit of end-users, [294] but noted that there may be a case for an uplift in order to promote faster migration to UFB. We noted Professor

[289] ibid, paragraph [453].
[290] ibid, paragraph [426].
[291] ibid, paragraph [419].
[292] ibid, paragraph [427].
[293] ibid, paragraph [430].
[294] ibid, paragraphs [434] to [445].

Vogelsang's advice that there was no empirical analysis of externality effects to draw on, but that in his judgement there was likely to be a positive net externality effect from migrating customers to fibre networks.

486. We also noted that in considering potential externalities, the relevant effects were those that accrued to (or harmed) end-users of telecommunications services in New Zealand, rather than potential wider effects.[295]

Our 2 April 2015 consultation

487. On 2 April 2015, we issued a further consultation paper in which we set out an analytical framework for considering the welfare implications of an uplift to the TSLRIC-based price for the UCLL service. [296] The framework provided a more quantitative basis for an assessment of the potential effects of an uplift, and identified what, in our view, were the key issues relevant to evaluating the consequences for consumer welfare of increasing the price for the UCLL service above our central estimate from our TSLRIC model.

488. In particular, we focussed on the incremental benefits and costs which could be reasonably attributed to any decision to apply an uplift to the UCLL TSLRIC price. This differs from a full assessment of the costs and benefits of an FTTH deployment such as the UFB, as most of these effects will emerge irrespective of whether a UCLL uplift is applied, due to the committed nature of the UFB investment. The focus was also on migration effects of an uplift, rather than investment effects.[297]

489. To quantify the potential effects of a TSLRIC price uplift, we assumed that the central estimate of the TSLRIC price was increased by $1 per month, and that this was fully passed through into the retail prices of those services which rely on the UCLL service. The higher retail price for copper-based services would lead to customers switching from copper to fibre services (based on a cross-elasticity of demand for fibre with respect to copper prices). As a result, under a scenario where an uplift is applied, the number of fibre subscriptions would be higher than if no uplift were applied.

490. We considered that the potential benefits from faster migration to fibre related to positive network externality effects, such as the ability to communicate with more people using ultrafast connectivity, and greater innovation in fibre-based services as a result of the higher customer base. We measured the value of such effects as a proportion of the level of expenditure on UFB services.[298]

491. We found that the potential welfare costs to consumers of the $1 increase would be approximately -$93 million in present value terms (over a 15 year period and with a

295 ibid, paragraph [452].

296 Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 2 April 2015.

297 We have separately considered more generalised investment effects through our analysis of the potential effects of a WACC uplift.

298 In the 2 April 2015 consultation, we noted that the only reference point we were aware of for such effects was derived from Ofcom's Network Externality Surcharge (NES) relating to mobile networks in 2005, which was 2% of expenditure. We also used 25% and 50% as sensitivities.

discount rate of 10%). The potential welfare gains ranged from $1.6 million to $38.8 million in present value terms (15 years, 10%). We also referred to a range of other potential effects which we had not attempted to quantify, but would be likely to further reduce the net benefits from any uplift.

492. In our 2 April 2015 paper, we had noted that the quantification of the potential welfare effects of an uplift is inherently difficult and subject to considerable uncertainty.[299] As mentioned at paragraph 485 above, Professor Vogelsang had advised that there is no empirical analysis to draw on, and that any such analysis would be complex and would lack a quantitative basis. In its cross submission for Chorus on the December 2014 draft determination, Houston Kemp noted that quantifying such gains is difficult due to limited data being available on households switching from broadband to UFB, and as a consequence, such benefits are typically addressed in a more qualitative way.[300]

493. In addition to seeking their views on our proposed framework, we invited interested parties to provide any empirical evidence which is relevant to quantifying externality effects in the context of an increase in UCLL prices.[301]

Key issues raised in submissions and our current view

494. Regarding the framework we proposed for considering a TSLRIC price uplift, the main issues raised in the submissions were broadly grouped around the model inputs and assumptions we had made, and welfare effects that we had omitted. In addition, some submissions commented on whether we should even consider an uplift in the first place.[302] A detailed summary of, and response to, submissions is set out in Attachment R.

495. Our current view is that an uplift to our central TSLRIC estimate for the UCLL service is not justified, as it is unlikely to best give effect to section 18. In our view, while an uplift to the UCLL price would be likely to accelerate migration from copper-based to fibre-based services, the higher costs faced by subscribers who remain on copper-based services are likely to significantly outweigh the potential benefits from faster migration.

496. In his review of submissions, Professor Vogelsang agrees that in the current case, no uplift should be applied:[303]

> I still agree with the Commission's Draft Determination's conclusions on the lack of a case for an uplift on the UCLL/UBA price, as long as the main parameters are selected in a neutral way, re-use of assets is not given special credit and there is no performance adjustment for the QoS difference between UFB and copper access.

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299 ibid, paragraph [44].

300 Houston Kemp "Response to Spark New Zealand's Attachment D: Illustrative estimate of social cost of high price, A Report for Chorus" 12 March 2015, p. 7.

301 ibid, paragraph [72].

302 See from paragraph 389 above.

303 Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [52].

497. We acknowledge that the potential benefits from faster migration to fibre are particularly difficult to quantify. Professor Vogelsang has also noted the paucity of empirical evidence on externality effects from faster migration from copper to fibre,[304] while Professor Cambini referred to some empirical work on fibre adoption over time and proposed an adjustment to fibre demand which we have incorporated in our analysis.[305] Submissions in response to our 2 April 2015 paper were unable to identify additional empirical evidence on the potential magnitude of the network effects that might arise from having more subscribers on fibre. We have, therefore, had to rely on a range of potential externality values, and in our view, these are unlikely to outweigh the higher costs that would be faced by copper-based subscribers as a result of a UCLL price which exceeded our central TSLRIC estimate.

498. As noted in Attachment R, we have made a number of amendments to our analytical framework for considering a potential uplift, in light of submissions received on our 2 April 2015 paper. The resulting range of potential net benefits from an uplift of $1 on our central estimate of the TSLRIC-based price for the UCLL service is summarised in Table below.

Table 8: Summary of net effects of a TSLRIC uplift

		Network externality as % of UFB expenditure		
		2%	**25%**	**50%**
Cross-elasticity	0.6	-$105,802,618	-$96,617,596	-$86,633,876
	1.2	-$104,609,732	-$86,239,687	-$66,272,248
	3.0	-$101,031,074	-$55,105,963	-$5,187,363

499. In addition, there may be other factors which could affect the net benefits from an uplift to the UCLL TSLRIC price. These include the potential for retail prices for UFB-based services to increase in response to the increase in copper-based prices, which would dampen migration to fibre; negative externalities for subscribers remaining on copper-based services; supply-side constraints in connecting UFB customers; and additional welfare losses for individuals who only switch to fibre as a result of the higher copper price.

Conclusion on section 18 considerations in relation to the TSLRIC price

500. In conclusion, we consider that our central estimate of the TSLRIC-based price for the UCLL service is likely to give best effect to the section 18 purpose statement. In our view, the positive network effects from faster migration to fibre are unlikely to outweigh the welfare losses from higher prices for copper-based services. We therefore, do not propose to adjust our central estimate of the TSLRIC-based price for the UCLL service.

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304 Ingo Vogelsang "Report on several submissions in the FPP proceeding for UCLL" 6 November 2014, paragraph [3].

305 Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 2 April 2015, paragraph [57].

Our approach to considering an uplift to the mid-point estimate of the WACC

501. This section considers whether an uplift should be applied to our mid-point estimate of WACC for the UCLL and UBA services. We have considered applying an uplift to the mid-point WACC estimate given:

501.1 the inherent uncertainty in estimating WACC. The WACC we apply is an estimate, because the actual cost of capital is not observable. Therefore, our WACC estimate could be higher or lower than the true WACC; and

501.2 WACC is likely to be an important parameter from the perspective of investors. The allowed WACC for UCLL and UBA could potentially send a signal to investors in telecommunications services more generally, regarding the allowed rate of return for regulated telecommunications services.

502. Consistent with our 2014 review of the WACC uplift for electricity lines and gas pipeline businesses, we consider that there are two primary questions that need to be addressed when considering whether a WACC uplift should be applied:[306]

502.1 Is there any reason to depart from the mid-point WACC estimate (ie, the best parameter based estimate we have of the cost of capital)?

502.2 If so, what is the most appropriate percentile?

503. We have considered possible sources of asymmetry from under- and over-estimating the WACC for UCLL and UBA. However, based on our analysis, we consider that there is no strong justification for departing from the mid-point WACC estimate.

504. In reaching this conclusion we have explored available quantitative evidence regarding whether a WACC uplift should be applied for UCLL and UBA, including a report prepared by Oxera on this topic.[307] We consider that the quantitative evidence is consistent with our view that no uplift should be applied.

505. More detailed discussion of our analysis regarding whether a WACC uplift should be applied for the UCLL and UBA services is contained in the separate cost of capital report released with this further draft determination.[308] That document and this document should be read together and combined to form our further draft determination.

Quantitative evidence regarding the appropriate WACC percentile

506. In our view, the strongest justification for departing from the mid-point WACC relates to incentives to invest in innovative new telecommunications services. Applying a WACC uplift for UCLL and UBA could potentially send a signal to investors

[306] Commerce Commission “Amendment to the WACC percentile for price-quality regulation for electricity lines services and gas pipeline services: Reasons paper” 30 October 2014, p. 28, paragraph [2.6].

[307] Oxera “Is a WACC uplift appropriate for UCLL and UBA?” June 2015.

[308] Commerce Commission “Cost of capital for the UCLL and UBA pricing reviews: Further draft decision” 2 July 2015.

that the risk of under-estimation of the allowed WACC is lower which, in turn, could lead to a reduced risk of delayed deployment of new telecommunications services in New Zealand.

507. Three main quantitative models are available for considering whether an uplift should be applied to the mid-point WACC estimate for UCLL and UBA:

507.1 The model developed by Oxera in its June 2015 report, which is based on an amended version of the framework used in our 2014 review of the WACC percentile for electricity lines and gas pipelines businesses.[309]

507.2 The model discussed in Attachment C of the April 2015 pre-conference paper, which we constructed by adapting the approach Oxera used during last year's Part 4 WACC percentile review.[310]

507.3 The model submitted by CEG (for Chorus), which is based on an amended version of the model originally developed by Professor Ian Dobbs in 2011.[311]

508. Each of these models adopts a slightly different approach to estimating the potential costs and benefits of applying a WACC uplift for the UCLL and UBA services. While the costs to consumers associated with a WACC uplift are relatively easy to measure, there is significant uncertainty associated with the potential benefits of an uplift. This uncertainty associated with measuring the potential benefits of a WACC uplift reflects:

508.1 the uncertainty regarding the connection between applying a WACC uplift for UCLL/UBA and incentives to invest in new telecommunications technologies more generally (as discussed in paragraphs 515 to 518 below); and

508.2 a paucity of information regarding key relationships and input values when attempting quantitative modelling (for example, the impact of the allowed regulatory WACC on the timing of investment in new technologies, and annual benefits to consumers associated with new telecommunications services) .

509. Although these models have been useful for exploring the question of whether a WACC uplift should be applied, we ultimately consider that they suggest the connection between a WACC uplift for UCLL/UBA and increased incentives to invest in innovative new telecommunications services is too uncertain to justify an uplift (compared to the increased cost to consumers, which are relatively certain). As noted by Oxera: [312]

309 Oxera "Is a WACC uplift appropriate for UCLL and UBA?" June 2015.
310 Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 2 April 2015, paragraphs [73 to 92] and Attachment C.
311 CEG "Welfare effects of UCLL and UBA uplift" March 2015.
312 Oxera "Is a WACC uplift appropriate for UCLL and UBA?" June 2015, p. 37.

> …the evidence [in support of an uplift] is not strong, and requires significant speculation about the nature and scale of benefits of future innovation, and, therefore, does not contradict the continued use of a midpoint WACC for UCLL/UBA.

510. Further discussion of these quantitative models is contained in the separate cost of capital report for UCLL and UBA, released with this further draft determination.[313]

The potential role of a WACC uplift across different categories of investment

511. When determining whether there is any reason to depart from the mid-point WACC estimate, we have considered the potential role of a WACC uplift across different categories of investment. The main categories we considered are:

    511.1 investment in maintaining, upgrading and expanding the copper network; and

    511.2 investment in new telecommunications services.

512. Our view is that there is limited justification for a WACC uplift to incentivise further investment in Chorus' copper network.

    512.1 In terms of upgrading the copper network, we agree with submissions which argue that there is a reduced need for further investment in the copper access network for most parts of New Zealand, given the deployment of UFB and RBI.[314]

    512.2 Regarding maintenance of the copper network (and the risks of network outages resulting from under-investment), we note that the impact of outages is likely to be significantly reduced relative to electricity lines services.[315] This is because:

        512.2.1 UCLL and UBA outages are likely to be relatively localised, given that these services relate to the access network (rather than backhaul/transmission lines);

        512.2.2 the presence of substitutes (eg, mobile networks) reduces the impact on consumers of outages on the copper network; and

        512.2.3 competitive pressure from other networks (such as mobile and fibre) may also help generate incentives to invest in maintaining the copper network, particularly in areas where Chorus is not the LFC.

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313 Commerce Commission "Cost of capital for the UCLL and UBA pricing reviews: Further draft decision" 2 July 2015.

314 See, for example, Network Strategies "Review of issues from UCLL and UBA submissions: Cross submission for the UCLL and UBA Draft Determination" 20 March 2015, p. 68; WIK-Consult "Submission on the Commerce Commission's analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 8 May 2015, paragraph [4].

315 Under Part 4 of the Commerce Act, we currently apply a WACC uplift to mitigate the risk of major supply outages on electricity lines and gas pipelines networks (resulting from under-investment).

512.3 For network expansion, capital contributions help cover the cost of any network new connections.

513. As discussed in paragraphs 520 to 523 below, there are also other factors which suggest there is limited need for a WACC uplift to incentivise investment in the existing copper network, including geographic averaging, certain features of the TSLRIC modelling (such as no asset re-use and no performance adjustment), and differences in the treatment of new investment between TSLRIC and RAB-based regulatory regimes.

514. In terms of incentives to invest in innovative new telecommunications services, we consider that applying a WACC uplift for UCLL and UBA could potentially send a signal to investors that the risk of under-estimation of the allowed WACC is lower which, in turn, could lead to a reduced risk of delayed deployment of new telecommunications services in New Zealand.

515. However, as discussed above, we consider that the link between a WACC uplift for the UCLL and UBA services and the benefits associated reducing the risk of delayed deployment of new telecommunications technologies in New Zealand is too uncertain to justify the higher costs to consumers.

516. The strength of this link will depend on factors subject to considerable uncertainty, such as:

516.1 The probability of a new telecommunications technology being commercialised, with sufficient demand to be viable in New Zealand, which ends up being subject to regulation.

516.2 Whether applying a WACC uplift for UCLL and UBA will provide a credible commitment, such that investors are confident any future telecommunications services which are regulated in New Zealand will receive a similar uplift.

516.3 The materiality of a WACC uplift to the decision regarding whether to deploy the new telecommunications service in New Zealand, relative to other factors such as uncertainty around consumer willingness to pay/uptake, and the potential for a response from competitors.

517. In contrast, the costs to consumers of a WACC uplift are relatively certain and material. For example, we estimate that increasing the allowed WACC by 50 basis points (from 6.03% to 6.53%) would increase the combined UCLL and basic UBA monthly rental prices in the first year of the regulatory period by approximately $1.51, from $37.89 to $39.40.

518. Overall, we consider that the link between a WACC uplift for UCLL and UBA and benefits from earlier deployment of new services is too weak to justify an uplift, when compared to the certain (and potentially very large) cost to consumers. Therefore, our view is that a WACC uplift for UCLL and UBA would not best achieve the section 18 purpose.

Conclusion on section 18 considerations regarding WACC uplift

519. For the reasons given above, we consider that our mid-point WACC estimate for the UCLL service is likely to give best effect to the section 18 purpose statement. Our assessment of the likely welfare consequences of an uplift indicate that the potential benefits arising from new investment are too weak and uncertain relative to the welfare losses arising from higher prices of copper-based services.

Other considerations

520. In considering the results of the quantitative assessment discussed above, we have had regard to a number of relevant contextual considerations when assessing the case for an uplift.

521. First, in applying the FPP for the UCLL service, we are required by Clause 4A of Schedule 1 of the Act to determine a geographically averaged price. The costs of deploying and operating a telecommunications network are generally lower in urban areas, and higher in non-urban areas. For example, our current draft geographically averaged TSLRIC price for the UCLL service is $26.31 per month for 2015, whereas the urban TSLRIC price is $17.90 per month. The geographically averaged TSLRIC price is therefore 47% higher than the cost of building a replacement network in urban areas. As any new network-based entry is more likely to occur in urban areas,[316] the geographically averaged price provides for a margin which could have the effect of incentivising such entry.

522. Second, the TSLRIC costs of supplying the UCLL service are modelled by using the concept of a hypothetically efficient operator deploying a MEA, rather than using Chorus' actual costs. By setting a UCLL price which is largely independent of Chorus' actual costs, any uplift to either the WACC estimate or the central estimate of the TSLRIC price is likely to have a weaker effect in terms of stimulating investment by Chorus, than would be the case under a RAB-based regime (where any new investment by Chorus would more directly lead to an increase in the regulated asset base from which the regulated price is derived).[317]

523. Finally, Professor Vogelsang has also pointed to a number of features of the TSLRIC modelling and pricing principle which in his view mitigate the need for a further explicit uplift.[318] These include the absence of a performance adjustment to reflect the higher capability where a fibre network is modelled compared to the copper

316 This has been the experience observed In New Zealand, both in relation to fixed and mobile network-based entry.

317 Professor Vogelsang makes the same point: "TSLRIC simply does not generate an Averch-Johnson effect, because it is based on the HEO and not the RAB." Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [82].

318 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [118]; Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [24].

network over which the regulated UCLL service is supplied, and the decision to follow the classical TSLRIC approach to build a new network from scratch rather than incorporating any re-use of existing assets. As we noted in the December 2014 UCLL draft determination paper, the basis of these decisions was not to specifically err on the high side.[319] While we agree that these features of the TSLRIC price are likely to have the effect of promoting some of the benefits discussed above,[320] other modelling decisions that we have taken could arguably have some offsetting effect.

Consideration of the relativity requirement in the Act

We must consider the relativity between the UCLL service and the UBA service

524. Section 19(b) requires us to consider any additional matters specified in Schedule 1 regarding the application of the section 18 purpose statement. For the UCLL/UBA services, that additional matter is the relativity between the UCLL service and the UBA service.

525. The UCLL and UBA services relate to each other because access seekers can "unbundle" a cabinet or exchange. To unbundle, access seekers install their own DSLAM in the cabinet/exchange. To provide a broadband service to end-users served by that cabinet/exchange, access seekers who have unbundled only need to purchase the UCLL service from Chorus and not the UBA service. Where access seekers do not unbundle, they must purchase the UBA service from Chorus in order to provide a broadband service to end-users.

526. This relationship between the UCLL and UBA services is reflected in the FPP for the UBA service, which is to take the price for UCLL and then add to it the "TSLRIC of additional costs incurred in providing" the UBA service.[321]

527. The relativity of the price of the UCLL service to the price of the UBA service will therefore affect incentives to unbundle. The price of the UBA service is the price of the UCLL service plus the price of additional costs incurred in providing the UBA service, which we term here "the UBA increment". The greater the UBA increment is, the greater the incentive on access seekers to unbundle. The UBA increment is the cost access seekers avoid by unbundling. The ability of access seekers to unbundle provides access seekers with an alternative to Chorus' UBA service. Access seekers can purchase the UBA service from Chorus or install their own DSLAMs to avoid the need to purchase that service.

Our previous views in respect of relativity and responses from submitters

528. In our further consultation paper of 14 March 2014, we sought views on the role of relativity throughout the FPP pricing review determination processes for the UCLL

319 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [421].

320 As noted in the discussion of asset valuation, TERA has estimated the impact of allowing re-use, based on information supplied by Chorus in response to a section 98 request. This indicates that allowing for re-use of existing ducts could reduce the UCLL price from $26.31 per month to $23.84 per month, a 9% reduction.

321 Subpart 1 of Part 2 of Schedule 1 of the Telecommunications Act 2001.

and UBA services, and in particular whether parties considered that there were additional matters or evidence that we should take into account regarding relativity in the FPP pricing review determinations.[322]

529. We further consulted on relativity in our July 2014 regulatory framework and modelling approach paper, where we expressed our preliminary view that "…the relativity consideration guides us less towards attempting to promote further investment in the form of unbundling, and more towards the efficiency aspect of the section 18 purpose."[323]

530. Several submitters supported our preliminary position set out in our July 2014 regulatory framework and modelling approach paper without further commenting on the framework of relativity, including Chorus,[324] Spark[325] and Vodafone.[326]

531. In our December 2014 UCLL and UBA draft determination papers, our view on relativity remained unchanged from that expressed in our July 2014 regulatory framework and modelling approach paper.[327] We noted also that it was not clear that attempting to provide incentives for unbundling would in fact lead to unbundling,[328] and we considered that it would not be in the long-term best interest of end-users to actively promote unbundling in the context of increasing migration to fibre networks.[329] We also noted that the transitional arrangements in respect of the UBA increment likely provided the opportunity for unbundling investments made to date to be recovered.[330]

322 Commerce Commission "Further consultation paper on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle" 14 March 2014, paragraph [4].

323 Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [79].

324 Chorus "Submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paragraph [210].

325 Telecom "UCLL and UBA FPP: consultation on regulatory framework and modelling approach" 6 August 2014 paragraph [78].

326 Vodafone "Comments on consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, paragraph [E1.5]. Vodafone noted that it had a different view on the nature of efficiencies at play. Vodafone "Cross submission on consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL service" 20 August 2014, paragraphs [B3.1] to [B3.4]. We believe this issue concerns the implementation of relativity rather than the framework for addressing relativity.

327 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [470]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [407].

328 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [473]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [410].

329 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [390].

330 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [471]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [408].

532. With the exception of CallPlus and Wigley and Company (discussed below), further submissions have either been supportive of our general framework for relativity or have made no further comment (submitters have, however, discussed the relationship between relativity and the UBA MEA, which we discuss in more detail in Attachment B. For example, Spark agreed with our preference to favour efficiency in respect of the relativity requirement.[331] At the conference, Chorus supported our view to be neutral in respect of unbundling and Vodafone agreed with this.[332]

533. CallPlus has previously submitted that relativity remained a critical issue for its business and consequently an important consideration for competition in New Zealand.[333] CallPlus' submission on our December 2014 UCLL and UBA draft determination papers sets out the key reasoning for the impact of the relativity requirement on CallPlus' business, which is as follows:

533.1 Based on the UCLL and UBA prices in our December 2014 UCLL and UBA draft determination papers, CallPlus calculates that non-unbundlers face a 7% decrease in the total UBA price from the pre-IPP price. In contrast, CallPlus calculates that unbundlers who purchase only the UCLL service face a 20% price increase.[334] CallPlus notes that this hits it particularly hard, due to its high percentage of unbundled customers.[335]

533.2 If unbundlers are unable to offer competitive prices, then CallPlus submits that this can lead to underutilisation of their networks. Because of economies of scale, CallPlus submits that underutilisation can lead to further cost increases, leading to an upward spiral of cost per user, further reducing unbundlers' ability to compete.[336]

534. Wigley and Company submits that relativity can be achieved by erring on the low side of UCLL prices and the high side for the UBA increment, so that the total UBA price (UCLL plus UBA) is not increased.[337] In response to the view expressed in our December 2014 UCLL draft determination paper that to alter the prices in this way will require consideration of section 18 issues,[338] Wigley and Company submits that

331 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [183].

332 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 77.

333 CallPlus Limited "Submission on the Commerce Commission's Consultation Paper: Proposed view on regulatory framework and modelling approach for UBA & UCLL services" 6 August 2014, paragraphs [3] - [4].

334 CallPlus "Submission on the Commerce Commission's Draft determinations for UBA and UCLL services" CONFIDENTIAL, 20 February 2015, paragraphs [14]-[15].

335 CallPlus "Submission on the Commerce Commission's Draft determinations for UBA and UCLL services" CONFIDENTIAL, 20 February 2015, paragraph [6].

336 CallPlus "Submission on the Commerce Commission's Draft determinations for UBA and UCLL services" CONFIDENTIAL, 20 February 2015, paragraphs [8] and [16].

337 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [16.1].

338 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [475].

asymmetric cost concerns under section 18 are not relevant, because our draft determination will result in prices that are well above Chorus' actual costs.[339]

Our current draft view in regards to relativity

535. We consider first CallPlus' submission that, with a large proportion of unbundled customers, its business is adversely affected by the UCLL and UBA prices relative to a business with no, or a much smaller proportion of, unbundled customers.

536. We note that, to the extent that access seekers who are both unbundlers and non-unbundlers purchase the UCLL service, any price rise for the UCLL service affects all access seekers in the same way, whether they are unbundlers or not. In this context, the effect of any UCLL price rise should best be considered in absolute, rather than percentage, terms.[340] That is, all access seekers are faced with a price rise for the UCLL service (based on the modelled results in this draft determination) relative to the UCLL IPP price, regardless of whether or not they purchase the UBA service.

537. In regards to the decrease in the UBA increment in the UBA July 2015 further draft determination relative to that set under the previous retail-minus approach (and held constant under the transitional arrangements through to 2014), while this may be felt more by those purchasing the UBA service, rather than unbundlers, the decrease reflects a move from the previous retail-minus based approach to a cost-based approach. Therefore, to the extent that the price for the UBA increment reflects the efficient costs of providing the UBA service, then the decrease better aligns the price for the UBA increment with efficient costs.

538. CallPlus submits also that, to the extent that it is unable to remain competitive, then this can lead to underutilisation and an upward spiral of costs, further reducing the ability to compete. We note, however, that if an unbundler considering purchasing the UCLL service and incurring its own unbundling costs cannot compete with an access seeker purchasing both the UCLL and UBA services, then the unbundler has an option to purchase the UBA service instead.[341]

539. We note also that existing unbundlers have been protected to a significant degree by the transitional arrangements that applied until 1 December 2014. In particular, the arrangements held constant the price for UBA set under the previous retail-minus approach, providing the opportunity for unbundling investments to be recovered. Our draft decision on the UBA increment suggests that significant recovery has, de facto, occurred.

339 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [16.7].

340 The risk with considering the price rise in percentage terms is that the same price rise in absolute terms can differ in percentage terms for unbundlers or non-unbundlers, depending on the base which it is applied to (eg, UCLL only, or UCLL plus the UBA increment).

341 If an unbundler cannot compete with a non-unbundler, and given that the UBA increment is determined using a framework of efficient costs, then this might also suggest that the former has inefficiently high costs relative to the latter. It is not in the long-term benefit of end-users to provide for competition to occur where it is inefficient.

540. In response to Wigley and Company's submission that relativity can be achieved by erring on the low side of UCLL prices and the high side for the UBA increment, we remain of the view that this would require consideration of section 18 issues. It does not appear that the Wigley and Company proposition is based on asymmetric cost/uncertainty considerations;[342] rather, the proposition appears to be that the UCLL price should be decreased below, and the UBA increment increased above, actual forward-looking efficient costs. We do not consider that this would promote competition for the long-term benefit of end-users, for the following reasons:

540.1 Setting the UCLL price below forward-looking efficient costs would likely undermine efficient cost recovery and incentives to invest.

540.2 While setting a lower UCLL price would lower input costs to unbundlers, it is uncertain whether this would be passed through to end-users, particularly as unbundlers compete against non-unbundlers who do not receive a corresponding reduction in input costs. We would also be concerned that an increase in the UBA increment and decrease in the UCLL price undermines competitive neutrality as between unbundlers and non-unbundlers (as discussed above).

540.3 If a lower UCLL price were passed through to end-users served by unbundlers, this might skew incentives for efficient migration of end-users to fibre networks, and potentially slow migration with consequential impacts on the welfare benefits arising from migration to fibre networks.

540.4 While an increase in the UBA increment may provide incentives for unbundling, as we have noted in the December 2014 UCLL and UBA draft determination papers, we cannot be sure that this will in fact lead to unbundling or whether such unbundling is in the long-term benefit of end-users, particularly in the context of increasing migration to fibre networks.[343] Professor Vogelsang has also noted that, absent quality improvements, higher prices that encourage infrastructure-based competition will not be in the long-term benefit of end-users.[344]

541. On balance, we do not believe there is sufficient evidence for us to change our position on relativity. We remain of the view that relativity guides us less towards attempting to promote unbundling, and more towards the efficiency aspects of the section 18 purpose statement which we consider are likely to have a larger effect on the promotion of competition for the LTBEU. We consider that we should be neutral towards the promotion of unbundling, and allow for unbundling to occur to the

342 To the extent that Wigley and Company's proposition is based on asymmetric cost/uncertainty considerations, then the discussion in the earlier sections of this Chapter is relevant.

343 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [473]; and Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [410].

344 Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [103].

extent that it is efficient. Accordingly, we do not propose to make any adjustment to our central estimates of the TSLRIC-based prices of the UCLL and UBA services on the grounds of relativity.

Chapter 5: Non-recurring charges

Purpose

542. In this Chapter we explain the scope, approach, and modelling implementation we followed in setting prices for the non-recurring charges (NRC).

Further draft decisions

543. All NRC are included in the scope of this review.

544. Where possible, NRC will be priced on a top-down approach with an efficiency adjustment based on international indexation and national cross checks.

545. Where we cannot apply this approach, NRC will be priced either on an hourly rate or Price on application (POA) basis.

What are NRC?

546. NRC are charges levied on access seekers to recover time and material costs incurred outside of the UCLL monthly recurring charges.

547. For instance, when an access seeker requires a new service to be installed at an end-user's premise, there is work performed by Chorus to complete the installation. Different end-users will require different levels of work depending on their situation, extra wiring may be required or it may simply be a case of a remote activation completed internally by Chorus.

548. NRC are listed in the UCLL STD as "Service transaction charges (numbers beginning with 1)" and "Ancillary services (numbers beginning with 3)".[345] Charges are also categorised within the UCLL STD as either a Core Charge or a Sundry Charge. Core Charges are for the core components of the service. Sundry charges are for other components.[346]

549. Service transaction charges are predominately applied to activate or deactivate a service or to make a change to the service's characteristics. Ancillary services are more related to the network and supporting systems rather than individual end-user connections, for instance these include licence fees for software systems and installation of core network services.

550. The prices for NRC in the STD are set on the following basis:

    550.1 Fixed rates – this is where a price is set for a specific task with known scope and cost, for instance a transfer of an end-user from one access seeker to another.

[345] Commerce Commission "Consultation on setting prices for service transaction charges for UBA and UCLL services" 25 September 2014 paragraph [11].

[346] UCLL Sch. 2 Price List Consequential Amendments 30 November 2011, paras [2.1-2.3].

550.2 A set hourly charge – this is where the duration of the task is unknown and therefore cannot be set ahead of time. An example of this would be the provision of training to an access seeker on software systems.

550.3 POA – this is when a price is set following a request for a service where the work required is bespoke, for instance a network rearrangement. In accordance with the STD, if requested by an access seeker, Chorus is obliged to use all reasonable endeavours to provide two or more quotes.[347]

551. NRC form an integral part of the UCLL service and each STD, for UBA, UCLL and SLU lists multiple different charges for each service. Our objective is to ensure NRC prices align with TSLRIC principles.

Process background

552. NRC were initially consulted on in September 2014.[348] We consulted on the approach to take for determining how to set prices for the transaction charges that were set in the IPP determination.

553. In the UCLL IPP determination we benchmarked three of the nine service transaction charges in the UCLL STD. None of the ancillary charges listed in the UCLL STD were considered.

554. For SLU we only set the service recurring charges. We did not set any separate transaction charges.

555. Following submissions received, we have considered what the scope of the NRC review should comprise and how to implement the TSLRIC methodology for setting NRC prices.

Scope of NRC

556. Before considering the most appropriate way to achieve our objective, namely ensuring NRC prices align with TSLRIC principles, we must determine the NRC included in the scope of this pricing review determination.

557. In September, our view was that for the FPP determinations, we could only set prices for the transaction charges which were set in the IPP determinations. In this regard we said that parties applying for a pricing review determination, in accordance with section 42(1) of the Act, were applying for a review of that part of the determination that relates to that price for the service.

558. Chorus stated that sundry charges were set on a cost recovery basis or on a POA cost basis and therefore was in agreement with our position that the review was limited to what was considered and changed as part of the IPP determinations. [349]

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[347] UCLL STD Schedule 2, Charges 2.4.

[348] Consultation on setting prices for service transaction charges for UBA and UCLL services 25 September 2014.

559. However, all other respondents considered that our view was too narrow an interpretation for it to be correct.

560. Spark, Vodafone, Wigley and Company and CallPlus all submitted that the correct interpretation of section 42(1) of the Act is to focus on the price for the "designated access service", which includes all of the charges, recurring and non-recurring that are related to it.[350,351,352,353]

561. It was argued by Wigley and Company that it would be unworkable for the Act to be interpreted so that only a subset of transaction charges is reviewed as part of the FPP.[354] The effect would be that multiple prices would never get the benefit of FPP review and would then be left in limbo, whether as IPP determination prices and/or as POA. Vodafone argued that if the Commission was confined in the scope of its review only to matters that were expressly addressed in the IPP determination or an application for price review, this would exclude relevant matters that ought to be considered as part of the FPP.[355]

562. Spark argued that its interpretation of section 42(1), which did not constrain the Commission in its review of all the charges, was supported by the fact that the FPP is a completely new pricing review process, underpinned in the Act by a completely different costing methodology than the IPP process.[356] Spark stated that the FPP exercise was not a second look at or correction of the way the IPP determination was done.

563. As such, this group of submitters stated that we are in fact required to assess each of the costs that relate to the relevant designated access service, with this not being limited to the prices that were set in the IPP determination.

564. After consideration of the responses received, we have revisited our preliminary view.

565. We agree with the submissions received from Spark, Vodafone, Wigley and Company and CallPlus and that the correct interpretation of section 42(1) of the Act focusses

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349 Chorus "Submission in response to the Commerce Commission's consultation paper 'Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 9 October 2014, para [17].

350 Spark "Setting prices for service transaction charges for UBA and UCLL services'" 9 October 2014, para [7].

351 Vodafone "Submission on consultation paper on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, p.2.

352 CallPlus "Submission on the Commerce Commission's Consultation paper: setting prices for service transaction charges for UBA and UCLL" 9 October 2014, para [8].

353 Wigley and Company "Submission on consultation on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, para [4.2].

354 Ibid, para [4.2(e)].

355 Vodafone "Submission on consultation paper on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, p.2.

356 Spark "Setting prices for service transaction charges for UBA and UCLL services'" 9 October 2014, para [6].

on the "designated access service", which includes all of the charges, recurring and non-recurring that are related to it.

566. The definition of "service" is not distinguished between services that are either once-off or recurring but rather it is all encompassing. [357] This means that all of the various recurring and one-off prices together constitute the "price to be paid for the service" that were part of the determination.

567. This interpretation also aligns with the identified framework for carrying out the UCLL pricing review determination, including section 18 considerations. This interpretation ensures that all of the charges associated with the designated access services have been set as part of the FPP process based on forward-looking long run incremental costs. Also, this interpretation is consistent with achieving the objectives/outcomes of TSLRIC, for example in respect of ensuring there are incentives for efficient investment across the range of services that are included, providing for the efficient use of those services, and for providing incentives for cost minimisation in respect of those services. In this regard, and as discussed in Chapter 1, prices based on forward-looking long run incremental costs are also consistent with the section 18 purpose statement, and will promote competition for the long-term benefit of end-users.[358]

568. Chorus pointed out the sundry charges were never benchmarked as part of the IPP, but rather they were set as part of the STD process.[359] Sundry charges were excluded from the IPP assessment, as benchmarking them was not possible, however when you are building a cost model for the first time, it is our view that it is appropriate to include *all* of the costs related to the designated access service, which naturally includes the sundry charges. In this regard, we would agree with Vodafone's submission that to restrict our review could mean the exclusion of relevant matters that ought to be considered as part of the FPP review process.[360]

569. It is our understanding that we are required to conduct this price review of all of the service transaction charges in accordance with the TSLRIC methodology. In keeping with the approach of the TSRLIC methodology, this means that prices must be set based on efficient forward-looking long run incremental costs.

570. Finally, Chorus noted in its submission that UCLFS core transaction charges should be included as part of the FPP process and should be reviewed with the benefit of the TSLRIC process.[361] As noted in Chapter 1, in accordance with the provisions in the Act and the STD requirements and for the avoidance of doubt, the UCLFS prices will

[357] The definition of services as per subpart 1 of part 2 of Schedule 1 of the Act.

[358] The full discussion of the TSLRIC framework and of section 18 is in Chapter 1 of this document.

[359] Chorus "Submission in response to the Commerce Commission's consultation paper 'Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 9 October 2014, para [16].

[360] Vodafone "Submission on consultation paper on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, p. 2.

[361] Chorus "Submission in response to the Commerce Commission's consultation paper 'Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 9 October 2014, para [22].

change with the equivalent UCLL service prices and, as such, the UCLFS STD will be updated automatically when there is a final decision made with respect to the UCLL FPP.

571. In summary, we are now updating our view and propose to review all of the NRC listed in the UCLL STD as part of this FPP review. We consider that this interpretation is in line with the legislation. It also means that there is a complete package of charges that have been set on the basis of a consistent pricing principle. We consider that this aligns with the section 18 purpose statement, and that by imposing a full set of charges that have been assessed for efficiency, ensures that competition is promoted for the long-term benefit of end-users.

Modelling Options – September 2014 Approach

572. Having formed a view as to the scope of the review, we then have to consider how to undertake the review. In our September Consultation we considered the following options were open to us for determining NRC costs under TSLRIC:[362]

572.1 Top-down - use Chorus' service company charges and overhead costs as inputs;

572.2 Bottom-up - model the time and materials of the relevant activities and overhead costs; or

572.3 Top-down with cross checks - the data provided by Chorus will be the starting point and then similar charges in other countries will be used as cross checks to determine the costs of providing the transactions.

573. In the case of all three options, we noted a reasonable margin for overheads could either be applied to each service, or be part of the general overhead applied to the network costs.

574. Chorus and CEG submitted that the regulatory history has meant that Chorus (and Telecom prior) have been incentivised to minimise costs, by keeping the difference between the regulated prices and cost as profit.[363,364] Chorus argues that this, along with the competitive tender process, means that top-down reflects the real world costs of providing these services in New Zealand.[365]

[362] Consultation on setting prices for service transaction charges for UBA and UCLL services 25 September 2014, paras [31], [33.1], [33.2] and [33.3].

[363] Chorus "Submission in response to the Commerce Commission's consultation paper 'Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 9 October 2014, para [35].

[364] CEG "Memorandum – WIK transaction charges" 16 October 2014, para [13]

[365] Chorus "Submission in response to the Commerce Commission's consultation paper 'Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 9 October 2014, para [7].

575. Chorus submitted that if we use cross checks, then it is important that these reflect real world NZ activities.[366]

576. WIK submitted that one way of producing an efficiency factor in a CPI-X calculation would be international benchmarking.[367]

577. WIK submitted that the use of outsourced processes needs to be reviewed. It is not appropriate to add efficiency to Chorus' outsourced costs, rather we should consider whether outsourcing is itself an efficient starting point.[368]

578. WIK and Wigley and Company submitted that our approach to TSLRIC uses a hypothetical efficient operator as a tool, and therefore our approach to NRC cannot be based solely on Chorus costs. We should carry out bottom-up modelling or an efficiency adjustment.[369,370]

Approach

579. In order to address some of the issues raised in the submissions, and ultimately determine which modelling approach was appropriate, it was important for us to understand the availability of relevant data.

580. Accordingly, we requested information from Chorus, LFCs (Enable and North Power), and RSPs (Spark, Vodafone and CallPlus).

581. Chorus provided us with breakdowns of its service company activities (task time, hourly rate, transport, and material costs). However we discovered that (due to an understandable desire to minimise administration costs) service company activities are grouped into aggregated codes that Chorus applies to more than one NRC.[371]

582. Chorus did not provide us with any detail (task time, hourly rate etc) on tasks that it undertakes itself. These activities typically require software and records updates that do not involve a service company technician.

583. We found that because of Chorus' position in the market, as the only copper network operator, it was challenging to find comparable NRC activity being performed by any other NZ-based operators.[372]

584. However, through a process of significant analysis, we have been able to identify what we believe to be comparable activities between service companies acting for

366 Ibid, para 10.

367 WIK "Submission in response to the Commerce Commission's Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 8 October 2014, para [16].

368 Ibid, paras [7(f)], [20].

369 Ibid, para [27].

370 Wigley and Company "Submission on consultation on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, para [6.3].

371 Service company codes contain an indicative list of tasks that the technician may undertake, but may not depending on the specific circumstances. Chorus is charged the same price for a service code, regardless of how many tasks the technician actually completes.

372 CallPlus and Vodafone were asked to provide similar information but did not do so.

Chorus (copper) and [ ]**CI** (fibre). Understandably, comparing activities across different network platforms has required a degree of judgement.

585. To aid our analysis, we asked TERA to look for comparable international data. It was able to source potentially relevant information from seven countries – Denmark, France, Italy, Romania, Spain, UK and an EU country which requested confidentiality.

586. Having assessed submissions and the availability of relevant data, we have reached the following views on modelling approaches for UCLL NRCs.

587. A bottom-up model requires a detailed work breakdown structure of each NRC, considering all tasks performed by the individuals performing the work.

588. Due to the unavailability of detailed information that we needed to be able to undertake a bottom-up approach, as referred to by WIK and Wigley and Company, we were not able to build a model using the bottom-up approach. [373,374]

589. Although we note Chorus' submission that Chorus is incentivised to minimise costs and coupled with the competitive tender process in appointing service companies, we acknowledge that a top-down approach that only uses Chorus' costs, even those arrived at through competitive tendering, does not provide an independent efficiency test.[375]

590. Therefore, we have selected the top-down approach with efficiency adjustment. Recognising the data limitations encountered, we consider this approach is the most pragmatic and appropriate method, and it is consistent with the efficiency properties of TSLRIC, and therefore achieve our TSLRIC objectives/outcomes.

591. Additionally, we consider it is appropriate to model NRC on a copper network basis as opposed to a fibre network. This reflects the reality that not all tasks performed in a copper network have an equivalent in the fibre world.

592. An important implication of our proposed modelling approach is the acceptance that our hypothetical efficient operator would outsource its network provisioning and fault operations.[376] WIK has previously challenged whether employing service companies for this purpose was the efficient starting premise for NRC modelled costs.[377] We consider that outsourcing to service companies is an efficient starting point, this is supported by the number and range of clients that firms such as Downer, Transfield and VisionStream contract to within and outside New Zealand.

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373 WIK "Submission in response to the Commerce Commission's Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 8 October 2014, para [27].

374 Wigley and Company "Submission on consultation on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, para [6.2].

375 Chorus "Submission in response to the Commerce Commission's consultation paper 'Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 9 October 2014, para [36].

376 As Chorus uses outsourced field services we assume the hypothetical efficient operator will do the same.

377 WIK "Submission in response to the Commerce Commission's Consultation on setting prices for service transaction charges for UBA and UCLL services (25 September 2014)'" 8 October 2014, para [24].

Examples of these include contracts for network construction and network maintenance in Australia.[378,379]

593. Specialist service companies provide the benefit of experience working for multiple clients. They optimise labour utilisation by spreading their resources across multiple clients to ensure maximum use of their people.

Implementation

594. Accordingly, we asked TERA to advise on how we might implement a top-down with efficiency adjustment approach.

High-level modelling implementation

595. Based on TERA's recommendations, we undertook the following modelling approach:

595.1 Take Chorus' service company costs as the starting point.

595.2 Undertake an efficiency adjustment by adopting the lowest observed task time from other jurisdictions, where these are lower than Chorus' time.

595.3 For those sundry service components that are charged on a per hour basis, no efficiency adjustment for task time can be made. Where this is the case, TERA will calculate a revised service company hourly rate using the available New Zealand-based data.

595.4 Adding in Chorus' service company overhead, plus a TERA-derived Chorus overhead, calculate a revised cost-based NRC price.

595.5 Undertake a cross-check against New Zealand costs, where the prices calculated above are capped in line with the prices [ ]**CI** pays for comparable service company activities.

Chorus' service company costs

596. Chorus service company costs have resulted from a competitive tender process. We assume these contracts would include periodic cost reviews. Such reviews typically would accommodate both cost reductions from efficiency improvements and increases due to labour rates and other external influences.

International indexation efficiency adjustment

597. In the case of NRCs, efficiencies are derived from a combination of labour rates, time to execute tasks and travel costs. Labour rates and travel costs are specific to the New Zealand market.

[378] Transfield Services PTY Ltd "Transfield Services awarded key five-year agreement with NBN Co" (press release 10 June 2015).

[379] Visionstream PTY Ltd "Telstra - Access and Associated Services" (corporate website publication available at http://www.visionstream.co.nz/projects/telstra-a-and-as/ ,accessed 17:43hrs 23 June 2015).

598. By focussing on Chorus' service company task time budgets, we are implicitly retaining other New Zealand-specific cost factors, such as labour rates and travel time. By adopting an international indexation approach that assesses task times in other jurisdictions, we are testing labour efficiency. Where the lowest observed task time is lower than Chorus' service companies comparable activity we have adjusted task time budgets to reflect the efficiency of our hypothetical efficient operator model.

599. However, it must be noted that it is not always straightforward to make cross-country comparisons.[380]

600. By increasing the sample size to include multiple international service companies we can more accurately assess task time efficiency of local service companies.

New Zealand hourly rate update

601. There are seven sundry STD service components that do not fit within the top-down with efficiency adjustment approach. The charging basis for these components is per hour, and therefore, no efficiency adjustment for the duration of task time can be made.

602. The only adjustment made to these components (since they were set in 2007) is the annual (Labour Cost Index) adjustment (the STD requires us to make). We are not satisfied that the LCI-adjusted service company rate (from 2007) is a fair reflection of rates in 2015.

603. As we have the hourly rates of Chorus' service companies for 2014 (albeit subject to index adjustments), it appears short-sighted to retain historic 2007 rates. Accordingly, it is appropriate that the elements that comprise these charges (service company hourly rate, plus front office cost and common cost mark-ups) are reviewed at this time.

604. We are updating New Zealand-specific data with Chorus' latest service company data. This results in the modelled rate reflecting the lowest observed level in the market, reached through competitive tenders conducted by Chorus and LFCs. We consider that this process will produce a reasonable estimate of the rate our hypothetical efficient operator would be able to negotiate.

605. Accordingly, we asked TERA to calculate a revised service company hourly rate based on Chorus' latest service company cost data, which then has TERA's revised mark-ups applied to cover front office and common costs.

606. This approach is more top-down in nature, as it relies upon the competitive tender process to produce efficient rates.[381] However, a section 98 request data that was provided by Chorus shows that, of the seven service components, only [ ]**CNZCI** had any volume in 2014 (and this was still only approximately [ ]**CNZCI** transactions).

[380] TERA has been as transparent as possible in their NRC report on their inputs and assumptions to enable the industry to review it.

[381] Noting there is an additional LFC cross-check that follows this step.

Service company overheads

607. We asked TERA to review and comment on Chorus' service companies' overhead component. TERA note that service company overheads (of [ ]**CNZCI**) can be seen as a billing presentation, ie, Chorus consider the overall cost when selecting the most efficient service company. As a consequence, comparing it against other jurisdictions would not make sense. It is also to be noted that contracts between LFCs and service companies include overheads with similar ratios.

Chorus overheads

608. TERA has derived an appropriate Chorus overhead for NRCs in the (recurring charges) opex model, which breaks down overall overhead costs based on the revenues, ie, the same mark-up approach as used for recurring charges. We agree with the approach taken by TERA.

Cross-check against New Zealand costs

609. In addition to the international indexation efficiency adjustments and update of New Zealand hourly rates, we are implementing a cross-check against LFC service company costs. As stated above, under "Approach", we consider that including this additional step makes the best use of available data and increases confidence in the modelled results.

610. What we are proposing for prices set through international indexation is essentially a price cap on TERA's international indexation modelling results, which is based on "rebuilding" Chorus' service company codes using comparable tasks and costs from a comparable LFC, being [ ]**CI**.

611. This will act as a price cap for the prices that are produced through either our international indexation or New Zealand hourly rate modelling.

612. We have used [ ]**CI** for our LFC comparison. Its network is being built to pass approximately [ ]**CI** As a recently constructed network we assume it is similar to the network our hypothetical efficient operator would deploy and is, therefore, a reasonable proxy to test against. [ ]**CI** and, therefore, consider [ ]**CI** costs at the upper bound for equivalent tasks to Chorus.

613. The "rebuilding" exercise, which is set out in detail in TERA's NRC report,[382] has required a degree of judgement. Helpfully, Chorus and [ ]**CI** employ the same service company in the comparable service geography, which has made our analysis more straightforward.

[382] The full document title is "TSLRIC price review determination for the UCLL and UBA services non-recurring charges Methodology document". For ease of reading we use the term "TERA NRC report".

614. Where possible, we have identified [ ]**CI** work tasks that are sufficiently similar to Chorus codes to allow a direct comparison. An example could be installing a lead-in to a customer premise, which is similar to installing the equivalent copper lead-in. Likewise running fibre patch cords in an exchange can be considered the same as running copper jumpers, being work that physically connects two points in a network.

615. While there are clearly some differences in the work involved in installing fibre versus copper technology, we believe the use of these comparisons provides a useful empirical check against our modelled results from TERA.

Impact on NRC

616. As part of our assessment of NRC, we have considered the impact of pricing changes to the service components, in volume and total cost terms.[383]

617. We have found that volumes for different NRC vary significantly. The NRC for UCLL are characterised by a small set of high volume service components, predominately relating to new connection activity, with the remainder of service components showing very low or non-existent transaction volumes. As set out above, we consider that all NRC are within the scope of this Price Review Determination, however, based on 2014 volumes, some of the changes made to the NRC prices will have little or no impact on Access Seekers of UCLL. For instance, there are only [ ]**CNZCI** NRC which account for [ ]**CNZCI** of total NRC revenue and [ ]**CNZCI** of NRC transaction volume. There are [ ]] **CNZCI** NRC for which there is no transaction volume.[384] In addition to this, there [ ]**CNZCI** which accounts for less than [ ]**CNZCI** of total NRC revenue and [ ] **CNZCI** of transaction volume.

618. The four changes that we consider to be material in terms of volume and price change are:

618.1 1.1 MPF new connection - individual new connection where site visit required;

618.2 1.1 MPF new connection - individual new connection where no site visit required ;

618.3 3.6 No fault found; and

618.4 3.8 Abortive end-user site visit.

Price Terms

619. As noted above in our draft decisions, some NRC will be priced on an hourly rate or POA basis.

383 Based on 2014 data.

384 Chorus data December 2013 to November 2014.

POA

620. POA is a charging approach that has been a feature of the UCLL STD Price List since its inception. A POA is a charging mechanism that requires Chorus to use all reasonable endeavours to provide the access seeker with two or more competitive quotes.[385]

621. We have adopted POA for service components where a fixed fee or per hour charge is hard to establish and doing so may lead to under or over-recovery by the Access Provider. The key attributes supporting a POA classification is that the activity is low volume and customised to the access seeker's specific needs at the time.

622. In order to safeguard access seekers, there are requirements in the STD on how POAs can be charged, and our annual review process that assesses whether a fixed price could be established. We are not aware of any issues with the safeguards in place.

623. Having reviewed all NRCs, we consider that there is still a need for POA. In most cases, our classification of POA service components is unchanged (from what exists in the STDs today), as the activity continues to fit the key attributes set out above. Other than to acknowledge this point, we do not discuss these service components in any more detail below. However, we provide detailed reasoning where we are proposing a change that concerns POA.

Hourly rate

624. Where the scope of work is simple but has an indeterminate duration, a fixed charge is inappropriate. Costs for such work are subject to variable scale and unforeseen circumstances.

625. In such cases an hourly rate is an appropriate pricing mechanism.

Operational Support System Cost Recovery

626. There are multiple operational support systems (OSS) (eg, IT systems and databases) required to provision and manage a telecommunications service. In addition to fundamental network management (eg, network monitoring), such systems also enable access seekers to check service availability, place orders, and log and track faults.

627. Accordingly, there were a number of NRC that were established in 2007 to provide for recovery of the Access Provider's OSS.

628. We have worked with TERA to identify whether the opex model developed for recurring charges already provides for the cost recovery of these assets.[386] However, due to the myriad of Chorus systems involved, it is unclear to TERA and us whether the opex model includes these costs, and therefore, whether continuing to charge for these activities would amount to double recovery.

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385 For more detail, refer section 2 of Schedule 2 of UCLL STD.
386 An allocation of OPEX cost will be made to NRCs.

629. Our starting premise is to assume that the cost recovery of OSS is provided for in the opex model, and therefore, any NRC relating to OSS costs will be set to no charge to avoid double recovery.

Draft UCLL NRC

630. We address specific considerations under the relevant Service Component headings below. Where these considerations have been addressed by TERA we refer to TERA's NRC report for detailed information.

631. Summary tables for each set of charges are provided at the end of this Chapter.

Core UCLL NRC

MPF new connection - individual new connection where site visit required (Service Component 1.1)

632. Current price: $155.10.

633. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

634. Draft price: $122.16.

MPF new connection - individual new connection where no site visit required (Service Component 1.1)

635. Current price: $70.46.

636. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

637. Draft price: $45.00.

MPF new connection (bulk) - where no site visit required (Service Component 1.1)

638. Current price: $52.84.

639. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

640. Draft price: $27.43.

MPF transfer - individual transfer (Service Component 1.2)

641. Current price: $70.46.

642. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

643. Draft price: $51.24.

MPF transfer (bulk) (Service Component 1.2)

644. Current price: $52.84.

645. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

646. Draft price: $27.43.

Other service to MPF transfer - individual transfer (Service Component 1.3)

647. Current price: $70.46.

648. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

649. Draft price: $51.24.

Other service to MPF transfer (bulk) (Service Component 1.3)

650. Current price: $52.84.

651. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

652. Draft price: $27.43.

MPF relinquishment (Service Component 1.7)

653. Current price: No charge.

654. Our reasoning supporting the current STD charge stated:

> The Commission also understands that Telecom does not normally charge a relinquishment fee when a retail customer terminates a retail service, nor does it charge a relinquishment fee in respect of other wholesale services. This suggests that, to the extent that Telecom incurs costs when such services are relinquished, those costs are recovered through other charges to the retail or wholesale customer. Accordingly, the Commission considers that there should be no charge for MPF Relinquishment.[387]

655. We maintain our original reasoning as set out above that where costs are incurred from relinquishment (updating records etc), these are outweighed by the benefits of leaving the service intact, which allows Chorus to significantly reduce future connection costs at that premise.

656. Draft price: No charge.

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[387] Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled copper local loop Decision 609*" 7 November 2007, paragraphs [301-305].

Sundry UCLL NRC

Bulk transfer (Service Component 1.4)

657. Current price: POA.

658. TERA has suggested a range of prices could be set based on volume thresholds for this NRC as set out in Table 17 – “POA service components” in the TERA NRC report.

659. We invite submissions on this matter.

660. Draft price: POA.

Exception to BAU support (Service Component 1.5)

661. Current price: POA.

662. This is a bespoke, irregular and complex activity, therefore, POA pricing is appropriate.

663. Draft price: POA.

Bulk line transfer for a single end-user support (Service Component 1.6)

664. Current price: POA.

665. This is a bespoke, irregular and complex activity, therefore, POA pricing is appropriate.

666. Draft price: POA.

MPF move address (Service Component 1.8)

667. Current price: $26.85.

668. We agree with TERA’s modelling of “Non-recurring activities not mapped to service codes with fixed STD prices” which is set out at 1.2.1.2 in the TERA NRC report.

669. This involves remote management only.

670. Draft price: $5.82.

Remote tie cable service installation (Service Component 1.9)

671. Current price: POA.

672. TERA has suggested a fixed price plus price per metre, noting low volume for this charge for this NRC as set out in Table 17 – “POA service components” in the TERA NRC report.

673. In the absence of additional information, we consider this is a bespoke, irregular and complex activity, therefore, POA pricing is appropriate.

674. We invite submissions on this matter.

675. Draft price: POA.

Unauthorised automatic address pre-qualification order (Service Component 3.1)

676. Current price: Proposed pricing mechanism based on Chorus' forecast business case for development and operations cost divided by forecast volumes.[388]

677. On the basis that the descriptions for "Unauthorised" and "Authorised" are the same, with the only difference being whether there is or is not end-user authorisation, make "Unauthorised" price equivalent to UCLL *Authorised automatic address pre-qualification order (Service Component 3.2)*.

678. Draft price: No charge.

Authorised automatic address pre-qualification order (Service Component 3.2)

679. Current price: Proposed pricing mechanism based on Chorus' forecast business case for development and operations cost divided by forecast volumes.[389]

680. There is an equivalent transaction in UBA.

681. Our reasoning supporting the equivalent transaction for UBA stated:

> Telecom argues that it should be compensated for the costs of developing and maintaining a database with information about end-user premises, distances from exchanges, and estimated line attenuation. The Commission disagrees that there should be a charge for this service. For similar pre-qualification services, Telecom does not charge on a per end-user basis, and charges Access Seekers a monthly fee for access to Telecom's Access Seeker OSS. The Commission has not identified any jurisdiction where there is a per-order charge for Automatic Address Pre-qualification. Furthermore, to introduce such a charge would create an artificial barrier to entry, and increase customer acquisition costs for Access Seekers. Accordingly, the Commission maintains its view that there should be no charge for this service.[390]

682. We maintain our original reasoning.

683. The information stored in the database is information that Chorus needs to hold and maintain. The only recoverable cost (if any) is in making the database "wholesale-ready".

684. We consider that the hypothetical efficient operator would have a wholesale-ready database in place from commencement of operations and therefore already recovers cost through the opex model. There should be no charge to avoid double recovery.

685. Draft price: No charge.

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388 UCLL Sch. 2 Price List Consequential Amendments 30 November 2011 Table 3 UCLL ancillary services.
389 Ibid.
390 Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraphs [322-324].

Special manual pre-qualification investigation order (Service Component 3.3)

686. Current price: $118.78 per hour.

687. An hourly charge appears appropriate for this low volume activity.

688. Draft price: $58.24 per hour.

Manual line testing (Service Component 3.4)

689. Current price: $99.66 per hour.

690. An hourly charge appears appropriate for this low volume activity.

691. Draft price: $61.16 per hour.

MPF tie pair change or re-termination (Service Component 3.5)

692. Current price: $61.25.

693. We agree with TERA's modelling of "Non-recurring activities mapped to service codes with fixed STD prices" which is set out at 1.2.1.1 in the TERA NRC report.

694. Draft price: $45.00.

No fault found (Service Component 3.6)

695. Current price: $112.63.

696. There is an equivalent transaction in UBA.

697. Our reasoning supporting the equivalent transaction for UBA stated:

> In the draft UBA STD, the Commission requested a break-down of the [ ]**CNZCI** fee proposed by Telecom. Vodafone and Orcon/Kordia/CallPlus argue that the No Fault Found fee is too high, however they did not supply information outlining why they considered it too high, or provide another suggested figure in their submissions. Telecom outlined the basis for this fee, and considered that the charge for a No Fault Found should be such that it adequately recovers the cost of this activity. Telecom also argues that the fee should encourage Access Seekers to diagnose service complaints and end-user related errors, as a preventive measure before the fault is referred to Telecom. The Commission has applied Telecom's reduced estimate of direct front office costs, and determined that a No Fault Found fee of [ ]**CNZCI** is appropriate.[391]

698. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" with specific reference to code [ ]**CNZCI**, which is set out at 2.3.1.3 in the TERA NRC report.

699. Draft price: $81.40.

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[391] Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraphs [325-328].

Third party interference investigation (Service Component 3.7)

700. Current price: POA.

701. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

702. Draft price: POA.

Abortive end-user site visit (Service Component 3.8)

703. Current price: $99.66.

704. We agree with TERA's modelling of "Cancellation charge (Post truck roll)/ Abortive end-user visit" which is set out at 2.3.2.7 in the TERA NRC report.

705. Draft price: $17.64.

Cancellation of bulk transfer service request (Service Component 3.9)

706. Current price: POA.

707. Cancellation of a bespoke, irregular and complex activity. Can occur at any stage of the process with no certainty of costs incurred.

708. Draft price: POA.

Additional OO&T training (Service Component 3.10)

709. Current price: $112.32 per hour plus actual travel costs.

710. An hourly labour rate plus travel expenses is appropriate for this charge.

711. Draft price: $58.24 per hour plus actual travel costs.

Additional OFM training (Service Component 3.11)

712. Current price: $112.32 per hour plus actual travel costs.

713. An hourly labour rate plus travel expenses is appropriate for this charge.

714. Draft price: $58.24 per hour plus actual travel costs.

OO&T licence fee (Service Component 3.12)

715. Current price: $24.00 per access seeker per month.

716. Our starting premise is to assume that the cost recovery of OSS is provided for in the opex model, and therefore, any NRCs relating to OSS costs will be set to be no charge.

717. Draft price: No charge.

OFM licence fee (Service Component 3.13)

718. Current price: $24.00 per access seeker per month.

719. Our starting premise is to assume that the cost recovery of OSS is provided for in the opex model, and therefore, any NRC relating to OSS costs will be set to be no charge.

720. Draft price: No charge.

Additional copies of invoice (Service Component 3.14)

721. Current price: $112.32 per invoice.

722. The hypothetical efficient operator would implement modern BSS and OSS systems. These would include full B2B integration of accounting systems, enabling an RSP to electronically request additional invoices and therefore there is no labour cost for this activity. We therefore, propose no charge for this.

723. Draft price: No charge.

Additional billing information (Service Component 3.15)

724. Current price: POA.

725. TERA have proposed that best practice is to set a fixed rate for information requests as set out in Table 17 – "POA service components" in the TERA NRC report.

726. We invite submissions on this matter.

727. Draft price: POA.

Tie cable maintenance charge (Service Component 3.16)

728. Current price: POA.

729. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

730. Draft price: POA.

Fixing fault which Access Seeker no right of access (Service Component 3.17)

731. Current price: POA.

732. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

733. Draft price: POA.

Core Sub-Loop UCLL NRC

Sub-loop MPF new connection - individual new connection where site visit required (Service Component 1.1)

734. Current price: $258.94.

735. As per *UCLL MPF new connection - individual new connection where site visit required (Service Component 1.1).*

736. Draft price: $122.16.

Sub-loop MPF new connection - individual new connection where no site visit required (Service Component 1.1)

737. Current price: $108.77.

738. As per *UCLL MPF new connection - individual new connection where no site visit required (Service Component 1.1)*

739. Draft price: $45.00.

SLU MPF new connection (bulk) - where no site visit required (Service Component 1.1)

740. Current price: $81.57.

741. As per *UCLL MPF new connection (bulk) - where no site visit required (Service Component 1.1)*.

742. Draft price: $27.43.

SLU MPF transfer - individual transfer (Service Component 1.2)

743. Current price: $108.77.

744. As per *UCLL MPF transfer - individual transfer (Service Component 1.2).*

745. Draft price: $51.24.

SLU MPF transfer (bulk) (Service Component 1.2)

746. Current price: $81.57.

747. As per *UCLL MPF transfer (bulk) (Service Component 1.2).*

748. Draft price: $27.43.

Other service to SLU MPF transfer - individual transfer (Service Component 1.3)

749. Current price: $108.77.

750. As per *UCLL Other service to MPF transfer - individual transfer (Service Component 1.3).*

751. Draft price: $51.24.

Other service to SLU MPF transfer (bulk) (Service Component 1.3)

752. Current price: $81.57.

753. As per *UCLL Other service to MPF transfer (bulk) (Service Component 1.3).*

754. Draft price: $27.43.

SLU MPF relinquishment (Service Component 1.8)

755. Current price: No charge.

756. As per *UCLL MPF relinquishment (Service Component 1.7)*.

757. Draft price: No charge.

Sundry Sub-Loop UCLL NRC

Exchange based unbundled or resale services to SLU UCLL migration (Service Component 1.4)

758. Current price: POA.

759. No UCLL equivalent.

760. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

761. Draft price: POA.

Bulk transfer or SLU migration management (Service Component 1.5)

762. Current price: POA.

763. As per *UCLL Bulk Transfer* (Service Component 1.4).

764. Draft price: POA.

Exception to BAU support (Service Component 1.6)

765. Current price: POA.

766. As per *UCLL Exception to BAU support (Service Component 1.5).*

767. Draft price: POA.

Bulk line transfer or migration for a single end-user support (Service Component 1.7)

768. Current price: POA.

769. As per *UCLL Bulk line transfer or migration for a single end-user support (Service Component 1.6)*.

770. Draft price: POA.

SLU MPF move address (Service Component 1.9)

771. Current price: $26.85.

772. As per *UCLL "MPF move address" (Service Component 1.8)*.

773. Draft price: $5.82.

UCLL MPF to SLU MPF move address (Service Component 1.10)

774. Current price: $26.85.

775. There is no direct UCLL equivalent. This NRC appears similar to *SLU MPF move address (Service Component 1.9).*

776. As per *SLU MPF move address (Service Component 1.9)*

777. Draft price: $5.82.

SLU tie cable service installation (Service Component 1.11)

778. Current price: POA.

779. As per *UCLL Remote tie cable service installation (Service Component 1.9).*

780. Draft price: POA.

Unauthorised automatic address pre-qualification order (Service Component 3.1)

781. Current price: $0.77 per address.

782. As per UCLL *Unauthorised automatic address pre-qualification order (Service Component 3.1).*

783. Draft price: No charge.

Authorised automatic address pre-qualification order (Service Component 3.2)

784. Current price: $0.77 per address.

785. As per *UCLL Authorised automatic address pre-qualification order (Service component 3.2)*.

786. Draft price: No charge.

Special manual pre-qualification investigation order (Service Component 3.3)

787. Current price: $118.78 per hour.

788. As per *UCLL Special manual pre-qualification investigation order (Service Component 3.3).*

789. Draft price: $58.24 per hour.

Manual line testing (Service Component 3.4)

790. Current price: $99.66 per hour.

791. As per *UCLL Manual line testing (Service Component 3.4)*.

792. Draft price: $61.16 per hour.

SLU MPF tie pair change or re-termination (Service Component 3.5)

793. Current price: $61.25.

794. As per *UCLL SLU MPF tie pair change or re-termination (Service Component 3.5).*

795. Draft price: $45.00.

No fault found (Service Component 3.6)

796. Current price: $112.63.

797. As per *UCLL No fault found (Service Component 3.6).*

798. Draft price: $81.40.

Third party interference investigation (Service Component 3.7)

799. Current price: POA.

800. As per *UCLL Third party interference investigation (Service Component 3.7)*.

801. Draft price: POA.

Abortive end-user site visit (Service Component 3.8)

802. Current price: $99.66.

803. As per *UCLL Abortive end-user site visit (Service component 3.8)*.

804. Draft price: $17.64.

Cancellation of bulk transfer service request (Service Component 3.9)

805. Current price: POA.

806. As per *UCLL Cancellation of bulk transfer service request (Service Component 3.9)*.

807. Draft price: POA.

Additional OO&T training (Service Component 3.10)

808. Current price: $112.32 per hour plus actual travel costs.

809. As per *UCLL Additional OO&T training (Service Component 3.10)*.

810. Draft price: $58.24 per hour plus actual travel costs.

Additional OFM training (Service Component 3.11)

811. Current price: $112.32 per hour plus actual travel costs.

812. As per *UCLL Additional OFM training (Service Component 3.11)*.

813. Draft price: $58.24 per hour plus actual travel costs.

OO&T licence fee (Service Component 3.12)

814. Current price: $24.00 per access seeker per month.

815. As per *UCLL OO&T licence fee (Service Component 3.12)*.

816. Draft price: No charge.

OFM licence fee (Service Component 3.13)

817. Current price: $24.00 per access seeker per month.

818. As per *UCLL OFM licence fee (Service component 3.13)*.

819. Draft price: No charge.

Additional copies of invoice (Service Component 3.14)

820. Current price: $112.32 per invoice.

821. As per *UCLL Additional copies of invoice (Service Component 3.14)*.

822. Draft price: No charge.

Additional billing information (Service Component 3.15)

823. Current price: POA.

824. As per UCLL *Additional billing information (Service Component 3.15)*.

825. Draft price: POA.

SLU Tie cable maintenance charge (Service Component 3.16)

826. Current price: POA.

827. As per *UCLL Tie cable maintenance charge (Service Component 3.16)*.

828. Draft price: POA.

Fixing fault which Access Seeker no right of access (Service Component 3.17)

829. Current price: POA.

830. As per *UCLL Fixing fault which access seeker no right of access (Service Component 3.17)*.

831. Draft price: POA.

SLU MPF normalisation (Service Component 3.18)

832. Current price: POA.

833. There is no UCLL equivalent NRC.

834. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

835. Draft price: POA.

SLU grooming (Service Component 3.19)

836. Current price: POA.

837. There is no UCLL equivalent NRC.

838. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

839. Draft price: POA.

Summary table of charges

UCLL core charges

Transaction name	**Service component**	**Transaction volume** All volumes **CNZCI**	**Current price**	**Draft price**
MPF new connection - individual new connection where site visit required	1.1	[	$155.10	$122.16
MPF new connection - individual	1.1		$70.46	$45.00

new connection where no site visit required				
MPF new connection (bulk) - where no site visit required	1.1		$52.84	$27.43
MPF transfer - individual transfer	1.2		$70.46	$51.24
MPF transfer (bulk)	1.2		$52.84	$27.43
Other service to MPF transfer - individual transfer	1.3		$70.46	$51.24
Other service to MPF transfer (bulk)	1.3		$52.84	$27.43
MPF relinquishment	1.7	]	$0.00	$0.00

UCLL sundry charges

Transaction name	Service component	Transaction volume All volumes **CNZCI**	Current price	Draft price
Bulk transfer	1.4	[	POA	POA
Exception to BAU support	1.5		POA	POA
Bulk line transfer for a single end-user support	1.6		POA	POA
MPF move address	1.8		$26.85	$5.82
Remote tie cable service installation	1.9		POA	POA
Unauthorised automatic address pre-qualification order	3.1		$0.77	$0.00
Authorised automatic address pre-qualification order	3.2		$0.77	$0.00
Special manual pre-qualification investigation order	3.3		$118.78	$58.24
Manual line testing	3.4		$99.66	$61.16
MPF tie pair change or re-termination	3.5		$61.25	$45.00
No fault found	3.6		$112.63	$81.40
Third party interference investigation	3.7		POA	POA
Abortive end-user site visit	3.8		$99.66	$17.64
Cancellation of bulk transfer service request	3.9		POA	POA
Additional OO&T training	3.10		$112.32	$58.24
Additional OFM training	3.11		$112.32	$58.24
OO&T licence fee	3.12		$24.00	$0.00
OFM licence fee	3.13		$24.00	$0.00
Additional copies of invoice	3.14		$112.32	$0.00
Additional billing information	3.15		POA	POA
Tie cable maintenance charge	3.16		POA	POA
Fixing fault which access seeker no right of access	3.17	]	POA	POA

SLU core charges

Transaction name	Service component	Transaction volume All volumes CNZCI	Current price	Draft price
SLU MPF new connection - individual new connection where site visit required	1.1	[	$258.94	$122.16
SLU MPF new connection - individual new connection where no site visit required	1.1		$108.77	$45.00
SLU MPF new connection (bulk) - where no site visit required	1.1		$81.57	$27.43
SLU MPF transfer - individual transfer	1.2		$108.77	$51.24
SLU MPF transfer (bulk)	1.2		$81.57	$27.43
Other service to SLU MPF transfer - individual transfer	1.3		$108.77	$51.24
Other service to SLU MPF transfer (bulk)	1.3		$81.57	$27.43
SLU MPF relinquishment	1.8	]	$0.00	$0.00

SLU sundry charges

Transaction name	Service component	Transaction volume All volumes **CNZCI**	Current price	Draft price
Exchange based unbundled or resale services to SLU UCLL migration	1.4	[	POA	POA
Bulk transfer or SLU migration management	1.5		POA	POA
Exception to BAU support	1.6		POA	POA
Bulk line transfer or migration for a single end-user support	1.7		POA	POA
SLU MPF move address	1.9		$26.85	$5.82
UCLL MPF to SLU MPF move address	1.10		$26.85	$5.82
SLU tie cable service installation	1.11		POA	POA
Unauthorised automatic address pre-qualification order	3.1		$0.77	$0.00
Authorised automatic address pre-qualification order	3.2		$0.77	$0.00
Special manual pre-qualification investigation order	3.3		$118.78	$58.24
Manual line testing	3.4		$99.66	$61.16
SLU MPF tie pair change or re-termination	3.5		$61.25	$45.00
No fault found	3.6		$112.63	$81.40
Third party interference investigation	3.7		POA	POA
Abortive end-user site visit	3.8		$99.66	$17.64
Cancellation of bulk transfer service request	3.9		POA	POA
Additional OO&T training	3.10		$112.32	$58.24
Additional OFM training	3.11		$112.32	$58.24
OO&T licence fee	3.12		$24.00	$0.00
OFM licence fee	3.13		$24.00	$0.00
Additional copies of invoice	3.14		$112.32	$0.00

Additional billing information	3.15		POA	POA
SLU Tie cable maintenance charge	3.16		POA	POA
Fixing fault which access seeker no right of access	3.17		POA	POA
SLU MPF normalisation	3.18		POA	POA
SLU grooming	3.19	]	POA	POA

Monthly Space Rental Charge

840. Different to NRC, but also modelled separately are the prices we have set for a unique recurring charge, that are not captured elsewhere.

841. The UCLL and SLU STDs include a monthly space rental charge to connect Chorus' MDF and the network cable to remotely located access seeker equipment.[392] Accordingly, this charge applies only when the access seekers equipment is not co-located in Chorus' exchange or cabinet. As such, this is not a charge that is levied against every end-user connection but its applicability varies depending on an access seeker's equipment location.

842. We note that the materiality of this charge is minimal as there are few access seekers who locate their equipment outside Chorus' exchange or cabinet.

843. To set the forward-looking incremental long-run cost for this service we have sought up-to-date costs for providing a tie cable. TERA has been able to identify the cost of 25m and 50m tie-cables. TERA has then computed a linear interpolation in order to determine the cost of a 100m tie-cable. We have then calculated the cost of the SLU tie cable service by multiplying the UCLL price by the ratio of the SLU to UCLL tie-cable IPP prices.

844. Accordingly, we have set the following price for the remote tie cable space rental service:

	Year 1	Year 2	Year 3	Year 4	Year 5
UCLL Remote Tie Cable Service space rental charge	$13.42	$12.75	$12.11	$11.51	$10.93
SLU Remote Tie Cable Service space rental charge	$3.30	$3.13	$2.98	$2.83	$2.69

[392] Service component 2.2 Remote Tie Cable Service space rental charge.

Chapter 6: Backdating

Purpose and further draft decision

845. In this Chapter we set out the Commission's further draft decision regarding whether to commence the UCLL FPP regulatory period after the Commission's final determination, or at an earlier date.

846. The Commission's further draft decision is that the regulatory period should start in December 2015, after the final determination.

847. Commissioner Duignan prefers an alternative start date of 1 December 2014, and considers that a lump sum settlement of the difference between the IPP and FPP prices prior to the final determination should apply.

We have a discretion to backdate

848. We remain of the view that we have the discretion to set an earlier start date for the FPPs than the date of its final determination, ie, to backdate.

849. We have previously set out our legal advice that supports this view.[393] Most parties agreed that we have the discretion to backdate, and that the Court of Appeal judgment confirmed this but did not require us to backdate.[394, 395] However:

    849.1 Chorus argues that backdating is required by the Act and that this is supported by the Court of Appeal.[396]

    849.2 Wigley and Company argues that we are prevented from backdating under the Act.[397]

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[393] Commerce Commission "Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – supplementary paper" 25 March 2014.

[394] *Telecom New Zealand Ltd v Commerce Commission* HC Auckland CIV-2004-404-5417, 8 April 2005 and *Telecom New Zealand Ltd v Commerce Commission* CA75/05, 25 May 2006.

[395] See Spark, "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraphs [412]; Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, Paragraph [P1.1].

[396] Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 February 2015, paragraph [320].

[397] Wigley & Company "Submission on backdating in relation to draft UCLL and UBA pricing review determinations" 20 February 2015, paragraph [1.4-1.6]. We also note the point made by Wigley & Company that clause 15.12 of the General Terms of the UCLL STD constrains the Commission's ability to impose backdating. We disagree with this characterisation. In particular, we note that Part 15 of the General Terms are simply mechanical provisions that apply to the day-to-day relationship between Chorus and access seekers. The natural implication of the Wigley & Company position is that Commission's statutory power (and obligation) to set the price in accordance with the FPP (including, where the Commission finds that a backdated component would advance the s 18 purposes,) could be extinguished by a mechanical and contractual payment clause. We consider that this would be a perverse outcome and disagree with Wigley & Company.

850. We do not agree with either of these arguments. Having had a range of legal interpretations of the Act submitted to us and following our review of the two relevant judgments, we consider that:

850.1 we do not need an express statutory power to be able to start an FPP regulatory period prior to the final decision date – the reasoning in both the High Court and Court of Appeal judgments support this view.

850.2 the Court of Appeal's judgment relates to a scenario where there is a clear end date to the relevant determination, and takes significant colour from that context, including in the paragraphs cited by Chorus (eg, para [44]).

850.3 while the Court of Appeal's judgment may provide guidance to the Commission, it is not determinative of the start date of a FPP regulatory period.

850.4 any decision about the relevant start date for the regulatory period needs to be considered in its specific factual and statutory context against the section 18 purpose.

Basis for exercising discretion

851. The basis of the discretion for setting an earlier start date than the date of the final determination is section 18.

852. Our starting point in considering section 18 is that a TSLRIC price will promote competition for the long-term benefit of end-users, for the reasons laid out in Chapter 1 of this further draft determination, eg, provides appropriate build/buy incentives. In the next sections we have analysed whether there are any other section18 considerations which mean a start date of December 2015 or earlier (which would give effect to backdating) better gives effect to section 18.

853. In considering whether backdating promotes competition, we note that the retrospective implementation of prices cannot influence decisions already made. However, as we discuss below, the expectation of retrospective implementation at some future date may do so.

Our December 2014 preliminary view and submissions

854. In our December process and update paper we set out preliminary views on backdating.[398] In particular, we said that:

(i) Section 18 will provide us with the most important guidance.

(ii) Any decision to backdate will need to be demonstrably efficient.

(iii) Any decision to backdate will need to demonstrably promote competition in a way that is likely to directly benefit end-users.

[398] Commerce Commission "Process and issues update paper for UCLL and UBA pricing review determinations" 19 December 2014, paragraph [15].

855. Broadly, we consider that this approach captures the assessment required by section 18. In other words, we need the evidence described in (ii) and (iii) in order to carry out the overall section 18 assessment in (i).[399]

856. The Commission's preliminary view was to favour backdating for UBA and UCLL (and therefore SLU and UCLF) in this instance. This view was primarily based on conceiving of the FPP price as a correction of the "proxy" IPP price, with the FPP being a more accurate implementation of forward-looking cost-based pricing.[400]

857. We also note that a number of submissions engaged with section 18 in the context of the Commission's backdating assessment. Spark argued that backdating would not meet the section 18 purpose because it would be a bare wealth transfer that would not promote efficiency or flow on pro-competitive effects, and would not promote the long-term benefits of end-users.[401] By contrast, it argued that not backdating will have an observable efficiency effect.[402]

858. Similarly, Vodafone noted that backdating was purely a wealth transfer and the Commission should therefore not implement it.[403]

859. Wigley and Company, in the alternative to its primary position that backdating is not permitted, argued that a full section 18 analysis is required, and that this analysis must include a quantitative analysis.[404]

860. We set out our analysis of the factors which underpin our backdating assessment in this further draft determination, including:

860.1 context, including previous judicial comment;

860.2 considerations supporting a start date after the final Commission determination;

399 We note that, on reflection, the use of the word "demonstrably" in describing our task was unnecessary, as we do not consider that it adds any significant colour or threshold to that description.

400 Ibid, paragraph [16]. We note in this regard that Chorus agreed that the FPP price is more accurate (see Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 March 2015, paragraphs [342,348]). Vodafone, however, argued that there is no such correction and IPP prices remain valid (see Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraphs [P1.7-P1.8]). Similarly, Spark argued that IPP prices are legally enforceable and binding: a different FPP does not imply the IPP was wrong (see Spark, "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [407]). This point is addressed by way of the section 18 analysis carried out in this Chapter.

401 See Spark, "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraphs [86-89].

402 Ibid, paragraph [416].

403 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [P1.9(a)].

404 Wigley & Company "Submission on backdating in relation to draft UCLL and UBA pricing review determinations" 20 February 2015, paragraph [3].

860.3 considerations supporting an earlier start date.

Context

861. Significant reforms were made to the Act in 2011, in the context of Telecom's structural separation on 1 December 2011:

861.1 The retail minus UBA price was frozen for three years.[405]

861.2 A new cost-based pricing principle for UBA was introduced, applying from 1 December 2014. The Commission was required to make reasonable efforts to complete the cost-based IPP review of the UBA price by 1 December 2012, and any FPP pricing review determination by 1 December 2014.[406]

861.3 The UCLL price was required to be geographically averaged by 1 December 2014.[407]

862. Against this background, the Commission:

862.1 completed the UBA cost-based IPP review on 5 November 2013;

862.2 completed a re-benchmarking review of UCLL prices on 3 December 2012. Initial cost-based (IPP) UCLL prices were set in November 2007.

863. Both services are regulated under standard terms determinations that apply to all access seekers, and do not expire.[408]

864. As set out in our March 2014 supplementary paper, both the High Court and Court of Appeal have considered backdating in relation to the IPP/FPP structure in the Act. The Courts were asked by Telecom to make declarations that FPP prices relating to a bilateral determination, with an expiry date, could not be backdated. The Courts refused to make those declarations.

Considerations which support a start date of December 2015

865. Basing prices on our best estimate of TSLRIC for the UCLL and UBA services in New Zealand is consistent with setting efficient prices on a forward-looking basis. The most straight-forward way to achieve this is to implement a start date for the FPP prices at the point of the final determinations. The start date will then align with the point at which, in practice, market participants can base decisions on the final determined prices.

866. We consider below whether an earlier start date would nonetheless better promote the s 18 purpose.

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[405] Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011, sections 75, 76.

[406] Telecommunications Act 2001, Schedule 1, Part 2, Subpart 1; Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011, sections 77, 78.

[407] Telecommunications Act 2001, Schedule 1, Part 1, Subpart 1, clause 4A; Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011, section 73(3).

[408] Telecommunications Act 2001, sections 30A and 30Q.

Impact on RSP competition

867. The expected economic impact of an earlier start date than the final FPP determinations varies based on whether it is implemented via a lump sum payment or is "clawed back" through increasing the monthly prices of the UCLL and UBA services. We consider both cases below.

868. If an earlier start date is implemented through a lump-sum payment then we currently expect the following:

868.1 Retail competition will keep pressure on retail prices, and the larger proportion of this lump sum cost will generally therefore fall on the shareholders of RSPs.[409]

868.2 The draft prices include a material increase in the UCLL price and consequentially a potentially large lump sum payment by RSPs. Such windfall losses which are due to the regulatory process are likely to have some impact on continued investment in RSPs, as RSPs will continue to be dependent on material input costs subject to regulation.

868.3 Investment by RSPs is important for the continued evolution of competition in retail broadband provision and an earlier start date may potentially impact on RSP investment incentives.[410,411]

868.4 Consequently implementing an earlier start date via a lump-sum payment would not promote competition for the long-term benefit of end-users at the RSP level.[412]

869. If an earlier start date is implemented through claw-back then we currently expect the following.

869.1 This would represent a marginal cost increase to RSPs who all purchase the UCLL service in their regulated inputs in providing a broadband or voice service to end-users.

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409 We would not expect a one-off lump-sum cost or gain to be passed-through to retail prices where retail markets are competitive. In the alternative, where such payments or costs were related to the sale of products (a marginal cost) we would expect some level of pass-through. We note that in December 2014 Spark announced that it would increase retail prices in response to the Commission's draft pricing review determinations – Spark media release "Spark changes pricing to reflect Chorus wholesale copper line costs" 10 December 2014.

410 We would typically expect such investments to be short lived and consequently more frequent than for the underlying infrastructure provided by Chorus.

411 Wigley & Company set out its views on the investment consequences for RSPs at Wigley & Company 20 March 2015 Cross submission, paras [20.38] and [20.40].

412 We also recognise that there may be circumstances where a large one-off lump-sum payment can affect the financial viability of a company. This is more likely to affect the smaller RSPs. We consider ways this may be mitigated when we discuss implementation later in this Chapter.

869.2 Such an across-the-board cost increase is unlikely to have first order competition effects. We have received submissions on potential second order competition effects:

869.2.1 In its expert report for Chorus, CEG noted that higher prices may lead to a loss of economies of scale which may impact on competition.[413]

869.2.2 In its submission to the Commission, CallPlus noted its ability to compete through its network of unbundled exchanges is linked to its ability to achieve scale.[414]

869.2.3 We have little evidence to assess the materiality of this point.[415] However we note that it would not support an earlier start date implemented through claw-back.

Impact on long-term infrastructure investment incentives

870. We have also considered the extent to which investment incentives of infrastructure investors may be affected by an earlier start date.

871. Submissions raised a number of points in this regard. Chorus argued that an expectation of backdating promotes efficient investment and pricing and ensures Chorus is not undercompensated.[416]

872. Spark argued in response that there was no evidence that backdating will affect Chorus's future investment decisions and that future investment decisions will be made on their own merit.[417]

873. In our view, such investment can facilitate competition between RSPs through offering a greater ability to provide new retail services and may itself compete with other infrastructure.

873.1 Prior to an IPP/FPP process occurring investors decisions to sink costs in infrastructure could be expected to be linked to any expected regulatory price caps on the services which are provided from that infrastructure. However their expectations on the level of that price cap would not change with or without backdating of prices between an IPP and FPP decision. Generally speaking, there should be symmetric probabilities of an IPP being

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413 We previously considered this point in our December draft determination – Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service", 2 December 2014, paragraphs [440-441].

414 We discuss this point further in the relativity section of Chapter 4 of this further draft determination.

415 We can calculate the potential impact on price, but how that impacts on economies of scale of RSPs and in turn how that affects competition between RSPs is more difficult.

416 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations", 20 February 2015, paragraph [329].

417 Spark "UBA and UCLL FPP pricing review draft decision Cross submission" 20 March 2015, paragraphs [250], [261-264]

above or below an FPP and hence the expected financial outcome of the investment should be unaffected.

873.2 It may be the case that the spread of financial outcomes an investor might expect would be larger where no backdating is expected to occur.[418]

Impact on signals from TSLRIC prices

874. If backdating was implemented by claw-back, as a general principle this could lead to substantive increases in the TSLRIC based price for future years. This leads to a scenario where, in response to prices being below our central TSLRIC estimate level for a period, we would then be setting them above that estimate for a further period to "cure" the distortion. It is not apparent to us that this approach best achieves the outcomes that are intended to be promoted by TSLRIC pricing and the section 18 purpose.

875. Overall these considerations would not support the conclusion that an earlier implementation of the start date than the point of the final determination of the prices would give better effect to section 18.

Considerations which support an earlier start date

Legal context

876. A 1 December 2014 start date is consistent with the statutory context for the introduction of the amended cost-based pricing principle for UBA, and the date by which the Commission was required to made reasonable efforts to complete any UBA pricing review determination.

877. The UBA context is potentially relevant to UCLL as UCLL is part of the total cost "stack" for the UBA service, and the Act imposes a relativity requirement between the two services.

878. An earlier start date is also consistent with the Court of Appeal's observations in *Telecom v Commerce Commission*:[419]

> In our view Harrison J was right to uphold the contention by the Commission and TelstraClear that a price review determination relates back to the date of the initial determination. That is

[418] Without backdating, the outcome of an IPP will affect revenues and consequently the forecast range of potential revenues could be larger.

[419] Ibid, paragraph [44]. We note that the Commission's submissions to the Court in that case were also consistent with the Court of Appeal's view (Commerce Commission "Submissions of the First Respondent dated 1 February 2006", at paragraph [64]):

> Telecom submits (paragraph 3.7(e)) that backdating s 51 determinations does not provide for the s 18 purpose because efficiency is not served by altering the cost of the service after it has been consumed and paid for. The Commission submits that the commercial reality is that the providers of telecommunications services are aware that they provide these services in a regulated environment where the prospect exists that the regulator may impose price terms that are retrospective. Similarly, it enhances the Part 2 regulatory regime by providing a price that is, in Telecom's own words; "a more accurate fulfilment of the long term section 18 purpose". It is difficult to understand why a process that allows the regulator to give best effect to the purpose of the Act should be given a restrictive meaning.

consistent with the substitutionary nature of reviewing or appellate decisions which vary an original decision. The alternative view implies a potential for negativing the efficacy of the review process which the Act has established in order to serve the s 18 purpose. Moreover, the obvious function of the price determination regime is to fix the price for a period of time relevant to the application, not to fix the price for part of that time and another price for another part. We consider that the s 18 purpose is better served by substituting the revised price for the initial price ab initio rather than only after a period of relatively less efficient pricing. None of the arguments advanced on behalf of Telecom has persuaded us to the contrary.

Feed-through of modelled prices prior to the final decision

879. As noted in the framework, a conceptual basis for TSLRIC is to provide efficient price signals over time. As a general proposition, the earlier efficient signals take economic effect the better. An earlier start date may therefore provide better incentives to update retail prices with expected TSLRIC outcomes.

879.1 Chorus and a number of RSPs are sophisticated participants in telecommunications markets and are likely to be in a position to estimate the outcome of TSLRIC modelling.[420]

879.2 A commitment to implement a "true-up" of the difference between the IPP and FPP determinations ensures the prices paid by RSPs are independent of the time taken to carry out a FPP. If implemented by lump sum, this will provide the incentive for RSPs to price their retail services on the basis of their expected outcome of the price review process rather than on the basis of the IPP.[421]

879.3 Whilst parties' expectations of the TSLRIC modelled price may vary from the final determination, we would expect that those expectations would be more accurate in circumstances where the IPP price varies significantly from the FPP price.[422]

879.4 More generally this is no different from other markets where investment decisions and pricing commitments are entered into based on best estimates that may prove incorrect.

420 Submissions on this point presented diverging views. Chorus agreed that market participants can make educated assumptions and plan accordingly (see para [353] of Chorus 20 March 2015 Cross submission). Vodafone and Spark each made the point that there were significant practical constraints and too much uncertainty to expect people to act between draft and final prices (see Spark 20 March 2015 Cross submission paras [268-276] and Vodafone 20 March 2015 Cross submission paras [B2.3-B2.5]). Wigley & Company made a similar point to Spark and Vodafone and noted in particular that if Chorus is unable to predict FPP prices then RSPs and market analysts will also find it difficult (see Wigley & Company Submission on Backdating 20 February 2015, paras [20.1-20.8]).

421 The Commission's December 2014 Update Paper set out the Commission's preliminary view that it would backdate to 1 December 2014, but stated that this view "should not be seen as an indication of any general policy regarding backdating" – Commerce Commission "Process and issues update paper for UCLL and UBA pricing review determinations Consultation paper" 19 December 2014, paras [13 and 19].

422 For both the UCLL IPP re-benchmarking, and determining the initial cost-based UBA IPP, the process was further complicated by the very small number of comparable benchmarks.

Incentives to delay the FPP process

880. In a price review process, information generated by all parties allows the expectations of the likely final price to be updated over time. Part way through a process it can become apparent whether the FPP price will be higher or lower than the IPP price. At this point financial incentives to delay the process may arise with Chorus or with RSPs.

880.1 The Commission previously commented on this point in its submissions to the Court of Appeal in *Telecom v Commerce Commission*:[423]

> … if reviews do not have operative effect from the initial determination date, then the party that is likely to benefit from a higher (or lower) price will be disadvantaged in circumstances where the Commission is unable to expedite the pricing review process for any of a range of legitimate reasons.
>
> … where the reviewed price is lower than the initial price and is not backdated, the access seeker would be unfairly disadvantaged by having to pay substantial additional amounts (above cost) for the delivery of services which were provided in the past. Further, in that situation the access provider might be unfairly advantaged by recouping access prices which are substantially above cost for the period subject to the initial determination. Backdating the pricing review ensures that a party does not make any windfall gain from contractual provisions determined for the parties under the Act, and pursuant to which they are compelled to deal, but subject to either party being entitled to have the regulator revisit the accuracy of the price initially determined. A windfall from the non-application of a reviewed price is a situation that would clearly offend against the purposes of this part of the Act, set out in s 18. The converse also applies if benchmarking has set the initial price too low, and the service provider establishes on a TSLRIC assessment, that the efficient price should be higher.

880.2 The Commission has to balance the benefits of earlier resolution of uncertainty through a quicker move to a final determination against a fuller consideration of issues raised with it which may impact on the accuracy of the final price.

880.3 The expectation of backdating (where it incorporates some element of lump sum payment) will align the interests of all parties throughout the process in achieving an efficient and balanced timetable to minimise the disruption of a price review process.[424]

880.4 The alignment of interest promotes confidence in the regulatory framework and thereby competition in the long-term benefit of end-users and specifically in regard to incentives for capital intensive innovation.

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423 Commerce Commission “Submissions of the First Respondent dated 1 February 2006” at paragraphs [62-63].

424 Where backdating occurs through lump-sum payments, the ability of RSPs to pass these costs to end-users through retail prices will be limited by retail competition at the point where backdating is implemented.

Impact on investor confidence

881. Capital intensive innovation requires the support of investors who are placing their capital at risk. Such investors in the telecommunication sector will typically be familiar with TSLRIC but may perceive benchmarking as error prone and inaccurate. The commitment to backdating will reassure such investors that financial outcomes need not be dependent on the IPP.

882. The draft prices for UCLL are indicative of the potential for the margin of error in the IPP methodology. The “levelised” full TSLRIC modelled price for UCLL is $27.59 which is 17% higher than the IPP UCLL price of $23.52 or a $4.07 increase.[425]

Draft decisions

Commissioners Gale and Welson

883. Our further draft decision is that the regulatory period should start in December 2015, after the final determination.

884. Our starting point is that TSLRIC prices are intended to create forward-looking incentives for parties that promote competition in the long-term benefit of end-users. Accurate UCLL and UBA TSLRIC prices are regarded as efficient, at least in the sense of achieving a policy intention ie, providing appropriate signals for migration, copper broadband consumption and unbundling.

885. Having considered the impact on both Chorus and RSPs, we do not then see a compelling reason for backdating the FPP prices. On balance we consider that backdating (either via lump sum payments or claw-back) does not provide incentives that promote competition for the long-term benefit of end-users, and may in fact harm them.

886. To explain:

886.1 We consider that the RSP market can generally be regarded as “workably competitive”. Accordingly, any past “error” in prices should have been largely passed through to end-users. For this reason, we would propose that any backdating should only be implemented by way of a claw-back mechanism.

886.2 Accepting that claw-back is less damaging to RSPs than lump sum backdating, we are not convinced that it would promote competition for the long-term benefit of end-users.

886.3 In particular, if the prices have been “wrong” since the IPP, then we accept that RSPs’ and end-users’ levels of investment and consumption may have been distorted to some degree over this period. However, in our view there is nothing to be gained by reversing that “error” by increasing future prices

[425] By “levelised” we mean estimating a single price to apply over the full five-year regulatory period as we implemented in our December 2014 draft decision, rather than providing year by year prices which we are implementing in this further draft decision. We have levelised the price to make it more comparable to the IPP price.

above our central TSLRIC estimate. Specifically, that previous distortion cannot be undone and any forward-looking increase would only introduce a different distortion.

886.4 For these reasons we find it hard to see backdating as promoting competition for the long-term benefit of end-users.

886.5 Notwithstanding that backdating does not resolve past distortions, we have also considered whether backdating could be justified on the basis that it would promote investment which in turn would promote competition for the long-term benefit of end-users.

886.6 In this case, backdating would only have an effect where there is new investment and/or where some investment would be subject to regulation. Here we are not regulating a new investment and nor is it clear that a major new bottleneck investment would be regulated by way of an IPP/FPP. Accordingly, in the current case, it is not clear to us that backdating would have any material effect on investment. In any event, we note that the IPP/FPP error is symmetric and non-systematic so we do not see it as clearly adding undiversifiable risk to any future Chorus investment.[426]

886.7 Further, there is no evidence before us that not backdating will in fact mean that Chorus is not able to cover its actual costs. In particular:

886.7.1 Chorus will inevitably be limiting its further investment in much of its copper network as it overbuilds the Government subsidised fibre network;

886.7.2 Chorus can, and does, seek capital contributions from end-users where it is building out the boundaries of its copper network.

887. While we acknowledge the conceptual argument, we are also concerned about whether it is, in practice, appropriate or reasonable to expect RSPs to adopt the Commission's draft prices, or to apply their own TSLRIC modelling, to derive retail prices:

887.1 TSLRIC modelling requires significant judgement, so results can vary dramatically.[427] We are also not convinced that it is reasonable to expect all RSPs to perform this type of modelling;

887.2 Current Commissioners cannot bind future Commissioners to backdating: they will retain the discretion to decide whether to backdate at any point at which that decision arises.

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426 The range of factors that are relevant to investment decisions are further considered in the section entitled "Should an uplift be applied to the mid-point WACC estimate?" of the further draft decision on the cost of capital for the UCLL and UBA pricing reviews, published at the same time as this further draft determination.

427 For example, Analysys Mason's model for Chorus produces substantially higher prices than the Commission model of the same services.

887.3 Even if we could commit to future Commissioners to backdating, we do not see the distant prospect of lump sum adjustments as in itself clearly enabling competitive RSPs to raise prices pre-emptively. In our view, there was a sensible economic basis for RSPs to increase prices this year in anticipation of a price increase at the end of the year: the approaching price increase immediately raised the long run marginal cost of retaining or gaining customers: customers typically stay with an RSP for some years.

888. We also have a concern about giving draft decisions significant price signalling status: in our view this is not consistent with the legislative scheme. A draft is intended to allow parties to give views that inform the final decision: it is not a quasi-final decision itself, and may be significantly amended.

889. In reaching this draft decision, we carefully considered the High Court and Court of Appeal *Telecom* v *Commerce Commission* judgments.[428] We agree conceptually that the FPP "extinguishes and replaces" the IPP. We also acknowledge that the Courts support the further step of backdating in the context of a bilateral access determination under section 27.

890. In our view, however, the present context is very different to that considered by the Court. We are considering a different type of determination, under a different industry structure, and critically without the expiry date that led the Court of Appeal to describe Telecom's argument as envisaging "formalised futility".

891. Further, while we agree that an FPP price is more accurate than an IPP price, that accuracy relates to forward-looking incentives only. It is not an accurate reflection of Chorus' actual network costs, so the efficiency benefit of backdating is less clear to us than it was to the Court of Appeal.

892. In this context, and given that backdating does not on our analysis contribute to the incentives the Act asks us to promote, we are wary of reading a broader complete substitution principle into the judgments, especially when the statutory wording falls well short of this.[429]

893. Finally, we acknowledge that some parties during in the FPP process may have an incentive to delay the FPP decision. However, the Commission controls the FPP process and timing, so is able to prevent unnecessary delays. The discretion for the Commission to backdate also remains as a discipline on parties' behaviour.

894. This further draft decision is a departure from the higher level reasoning in our December 2014 preliminary views. While we do not make such a departure lightly, in our view the case for backdating was not persuasive after a more detailed, specific analysis.

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428 Ibid.

429 The UBA implementation wording in the Act is limited to the Commission making "reasonable efforts". There is even less basis for drawing any substitution implication from any statutory provisions relating to UCLL.

Commissioner Duignan

895. I consider that a start date of 1 December 2014 best promotes the section 18 purpose. I consider that lump sum settlement of the difference between the IPP prices and the FPP price should apply.

896. If the start date was 1 December 2014, the UCLL and UBA prices for the year from that date would be $26.89 and $11.45.[430] For reasons explained when discussing implementing the matching principle later in this Chapter, the UCLL prices for the years from December 2015 to December 2019 would be based on WACC incorporating a four year risk-free rate. Based on data for 1 April 2015, as used in this further draft decision, the UCLL prices for those years would be around $0.08 less than the prices resulting from a start date of 1 December 2015. For the same reason the UBA price for those years would be around $0.01 less than the prices resulting from a start date of 1 December 2015.

897. I find the Court of Appeal's logic in *Telecom* v *Commerce Commission* compelling and consider that it is generally applicable to pricing review determinations. As the Court held, consistent with the Commission's submissions at the time, the FPP produces a more efficient price that is effectively a substitute for the less cost reflective IPP price. In my view the FPP regulatory period should reflect that.

898. An earlier start to the FPP regulatory period is also consistent with the "reasonable efforts" requirement for UBA in the Act, ie, the statutory preference for a 1 December 2014 start date.[431] We were not able to complete the FPP review by that date, but backdating allows us to effectively meet it. For the reasons set out above, this logically flows through to UCLL as well.

899. An earlier start date will also:

899.1 promote incentives to get the more accurate FPP prices into the market place as early as possible, both by encouraging parties to adopt their own estimates and/or Commission drafts of the FPP prices, and by removing financial incentives to delay the process; and

899.2 reassure investors that they need not be reliant on less accurate benchmarking processes at any point.

900. Backdating is therefore consistent with providing the best platform for competition in the long-term benefit of end-users, because the most efficient price is applied and responded to earlier.

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430 This is based upon a one year WACC incorporating a risk-free rate as of 1 December 2014 of 3.62%: see Table 13 in the separate cost of capital report released with this further draft determination – Commerce Commission "Cost of capital for the UCLL and UBA pricing reviews: Further draft decision" 2 July 2015.

431 This is the earliest at which a cost modelled price for UBA could come into effect, as a retail minus based price was in effect prior to that date – refer Schedule 1, Part 2, Subpart 1 of the Act. Chorus agreed that backdating for UBA should be limited to 1 December 2014 – Chorus 20 February 2015 Submission, para [326].

901. The current case confirms this analysis. Spark increased its prices immediately on seeing our TSLRIC modelling results. Our further draft decision modelling results suggest that Spark's action was consistent with getting prices more reflective of the pricing principle into the market earlier than would have occurred if there had not been an expectation of backdating. Our emerging view favouring backdating supported that desirable process. Reversal of the emerging view regarding backdating will potentially undo those benefits. It may well create a pricing dilemma for Spark and other RSPs. Spark's price increases meant that its shareholders would not bear the cost of lump sum backdating to 1 December 2014, and Spark (and Vodafone) will be reluctant to reverse their price increases given this further draft decision indicates their current prices are reflective of the likely price review results.

902. In general, the pressure of retail competition, referred to earlier, generates powerful incentives for RSPs to invest in new and innovative services whenever opportunities arise. Spark, Vodafone and CallPlus' new owner's financial strength will limit the impact of exposure to future lump sum backdating on their ability and incentives to finance investment.[432] Accordingly, my assessment is that the major long-term effect of the Commission's backdating policy on the section 18 purpose relates to incentives for infrastructure investment which section 18(2A) of the Act draws to the Commission attention. In terms of section 18(2A), the key issue is infrastructure investors' confidence in the regulatory regime. Chorus' advocacy of backdating, expressed from the outset of the price review process - prior to the Commission indicating whether the FPP prices would be higher or lower than the IPP prices - supports the conclusion that backdating reassures infrastructure investors.[433]

903. In general, a policy of backdating is more conducive to regulatory consistency, which is vital to sustain confidence in the regulatory regime. Specifically, if a price review indicated benchmarked prices were higher than TSLRIC cost, it would be difficult to sustain public confidence in the Commission if Chorus was allowed to retain what would likely be described as excessive revenue not consistent with the pricing principle. A consistent policy of backdating would facilitate retention of public confidence in such circumstances.

904. A key reason for favouring lump sum backdating over claw-back is that lump sum backdating incentivises early adjustment of market prices to reflect estimates of the more accurate FPP price. It also encourages all parties towards expeditious completion of price determination reviews.

905. It is also relevant that claw-back results in market prices that deviate from the TSLRIC derived prices. Incurring this inefficiency can be justified by the importance of promoting the investment which is a pre-condition for competition for the long term

432 Fixed line competition for Telecom previously depended on smaller RSPs, but Spark's separation from Chorus, Vodafone's purchase of TelstraClear and ongoing consolidation have resulted in a financially robust RSP sector. Spark's NZX market capitalisation is over 4 times that of Chorus.

433 Commissioners cannot bind successors but backdating in the current price review determinations combined with the previous Court decisions would reassure infrastructure investors and help restore investor confidence lost when the effect of moving to a cost-based UBA price was not anticipated.

benefit of end-users but the expectation is that lump sum backdating will usually be preferable.

906. I do not consider that there is a case for backdating UCLL all the way to the 2012 re-benchmarking decision.

907. Lump sum backdating prior to 1 December 2014 would be contrary to the purpose of the statutory freeze of the UBA price for the three years after separation of Chorus from Telecom which was to allow unbundlers to recover the cost of their investments. This negates based on a statutory purpose consideration, in this specific case, the arguments in favour of lump sum backdating as a general policy set out above.[434]

908. In regard to claw-back, aalthough the modelled UCLL FPP prices are above the benchmarked UCLL IPP prices for the 2012-14 period, investors in Chorus should recognise the material difference in the regulatory regimes prior to the 1 December 2014. Prior to that date the UBA price was regulated on the basis of retail minus and these prices are substantially in excess of the draft TSLRIC prices. This more than offsets the difference between the IPP final prices and FPP draft prices for the UCLL service over this period.There is thus no case for claw-back.[435,436]

909. Finally, and for the avoidance of doubt, if the Commission did decide to backdate in its final FPP determination, I would support the approach to implementing the matching principle when setting the WACC during the regulatory period set out later in this Chapter.

How backdating could be applied, if we were to backdate

Purpose of this section

910. While our draft determination is not to backdate, we nonetheless thought it would be useful to provide an illustration as to how backdating could be implemented if that decision was to change.

911. As explained in paragraphs 876 and 877 of this Chapter, if we were to decide to backdate, we would set a start date prior to the date of the final determinations.

912. Accordingly, this section illustrates and explains:

912.1 the implications for our TSLRIC model, if we were to decide to backdate; and

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434 For completeness, I consider that the circumstances set out in these paragraphs would meet the "extraordinary" threshold suggested in paragraph 33 of Chapman Tripp's April 2014 advice to Chorus if their view of the legal framework for backdating was correct. ChapmanTripp "Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream (UBA) Access Services – Pricing Review Determination (PRDs) – Legal Framework" 11 April 2014.

435 Spark also noted that claw-back to 2012 would impact on previous investments by, and returns to, unbundlers over that period, contrary to the legislative framework – Spark, "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraphs [409-410].

436 Spark (then Telecom) suggest that claw-back relating to this earlier period should be ruled out by the prohibition on double recovery of costs in the Act: Telecom "UCLL and UBA FPP: further consultation and supplementary paper" 11 April 2014, paragraph 72.

912.2 how backdating could be applied over the regulatory period.

Illustration of the implications for our TSLRIC model, if we were to backdate

913. To illustrate the effect of backdating, we would use the TSLRIC price set in year 1 of our TSLRIC model,[437] as shown in the table below. As explained in Chapter 3, our TSLRIC model uses network costs that were collected in 2014. Accordingly, if we were to backdate to 1 December 2014, we will use the prices in year 1 in our TSLRIC subject to the cost of capital used.

Table 9: Illustration of prices used to estimate the backdating amount

Prices	2015	2016	2017	2018	2019	2020
UCLL						
WACC of 6.26% (price for backdating)	**26.89**					
WACC of 6.03%	26.31	**26.74**	**27.18**	**27.63**	**28.09**	**28.56**
UBA						
WACC of 6.26% (price for backdating)	**11.45**					
WACC of 6.03%	11.35	**11.15**	**10.97**	**10.80**	**10.65**	**10.52**
Total UBA						
WACC of 6.26% (price for backdating)	**38.34**					
WACC of 6.03%	37.66	**37.89**	**38.15**	**38.43**	**38.74**	**39.08**

914. If we were to backdate to 1 December 2012, we will need to extrapolate the price trends in our TSLRIC model to December 2012. The most practical way to implement this which was supported at the conference was extrapolation.[438]

915. If we were to backdate, it would potentially affect the cost of capital used in our model.

916. In its cross submission on our December 2014 draft decision, CEG (on behalf of Chorus) argued that if we decide to backdate then the WACC parameters should also be calculated as at the date prices are backdated to. CEG submitted:[439]

> It is well accepted regulatory practice that the cost of equity should be set at the beginning of the period over which that cost of equity will apply (ie the period which the price is

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437 The TSLRIC prices, with no backdating, factored in a year's price trend; hence year one in our price path is the second year in the TSLRIC model.

438 We note that CEG and WIK suggested a similar approach at the conference, to refine the TSLRIC model for purposes of backdating. They suggested that we need to backdate price trends in our model, but to also recognise that this would only address the input costs and the ORC of the particular asset that we have modelled. They suggested that we could assume that our assumptions such as the choice of MEA and level of aerial remain reasonable approximations. See Commerce Commission, "UBA and UCLL pricing review determination conference transcript", 15-17 April 2015, p. 460 (see the approach proposed by Jason Ockerby); It appeared that this approach was supported by Karl-Heinz Neumann at Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 461.

439 CEG "Issues from submissions UCLL and UBA" March 2015, pp. 22-24, paragraphs [75 and 78].

effectively determined at). That is, defining a regulatory period as the period over which prices are regulated, the cost of capital used should be the best estimate of the cost of capital at the beginning of that period. Accordingly, if UCLL and UBA prices are to be back-dated then the WACC parameters should also be calculated at the period the prices are back-dated to (ie, their effective date).

917. Network Strategies appeared to support this view at the conference, stating:[440]

> While we don't support the use of backdating as a hypothetical, that if the Commission was mindful to undertake backdating then the WACC really needs to be applicable for the regulatory period. So, effectively the start date of the regulatory period is being brought, pushed backwards and so then the WACC would need to be recalculated appropriately for that new regulatory period.

918. We agree that, in principle, the term of the risk-free rate should match the regulatory period. This is consistent with the approach we use under the cost of capital input methodologies (under Part 4 of the Commerce Act), and in our further draft decision on the WACC for UCLL and UBA.

919. We have considered how the principle of matching the term of the risk-free rate to the regulatory period is best implemented in the context of backdating.

920. Our conclusion is that we can apply this principle while taking into account information available between the start date of the regulatory period (ie, 1 December 2014) and the final determination, by recognising the precise nature of the matching principle. Specifically, the principle is that the term of the risk-free rate should equal the time period to the next reset of WACC.

921. Where the start date of the regulatory period is earlier than the final determination date, the matching principle can be implemented by:

921.1 setting WACC for the period between the start date of the regulatory period and the final determination date using a risk-free rate, as at the start date, for a term matching the difference between the two dates; and

921.2 setting WACC for the remainder of the regulatory period using a risk-free rate for a term equal to the remaining regulatory period, as at the closest practical date prior to the determination date.

922. We consider that setting WACC this way would achieve the benefits of the matching principle.[441] This would result in:[442]

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440 Commerce Commission "UCLL and UBA services final pricing principle conference held on 15-17 April 2015", p. 340 (comments by Noelle Jones).

441 Dr Martin Lally "Regulation and the Choice of the Risk Free Rate", Accounting Research Journal, Volume 17 No 1, 2004; Van Dijk Management Consultants "Evaluating Economic Depreciation Methodologies for the Telecom Sector".

442 See the separate WACC report released with this further draft determination for discussion of the parameter values used to generate these WACC estimates. Commerce Commission "Cost of capital for the UCLL and UBA pricing reviews: Further draft decision" 2 July 2015, Attachment C.

922.1 a mid-point post-tax WACC of 6.26% for the year from 1 December 2014, based on a one year risk-free rate of 3.62%; and

922.2 a mid-point post-tax WACC for the remainder of the 5 year regulatory period of 6.00%, based on the 4 year risk-free rate as at 1 April 2015 of 3.22% (compared to the 5 year rate of 3.26%).

923. If the start date was 1 December 2014, the UCLL and UBA prices for the year from that date would be $26.89 and $11.45. The UCLL prices for the years from December 2015 to December 2019 would be around $0.08 less than the prices resulting from a start date of 1 December 2015. The UBA prices for the years from December 2015 to December 2019 would be around $0.01 less than the prices resulting from a start date of 1 December 2015.

924. The final prices for the years from 1 December 2015 will in any event depend on the risk-free rates and other parameters as at the data lockdown date for the final determination. As noted in the separate WACC paper released at the same time as this further draft determination, we intend to estimate the WACC for the final determination as at 1 September 2015.[443] (The WACC estimate as at 1 April 2015, as described in paragraph 922.2 above, is currently used as a proxy for 1 September 2015.)

925. We invite further submissions on this approach. In particular, we invite further submissions on the appropriate approach for estimating WACC for our final determination, if prices were to be backdated, including the date for estimating the risk-free rate (and debt premium).

926. By way of illustration, the TSLRIC prices used when calculating the backdating amounts discussed in the remainder of this Chapter are based on the mid-point post-tax WACC as at 1 April 2015 of 6.03% (based on a five-year risk-free rate of 3.26%). We note that this WACC number would be adjusted as explained in paragraphs 920 to 924 above, if we were to backdate.

Options for implementing backdating (if we were to backdate)

927. We considered the following implementation options, for backdating:

927.1 one off lump sum payment paid shortly after our final determination;

927.2 pre-determined lump sum payments paid over a certain period (smoothed lump sum payments);

927.3 claw-back mechanism; and

927.4 a composite approach, where the backdating amount would be recovered through both lump sum payments and a claw-back.

443 Commerce Commission "Cost of capital for the UCLL and UBA pricing reviews: Further draft decision" 2 July 2015, paragraph 6.

928. We provide further information on each of the above four implementation options in Attachment P.[444]

929. If we decided to backdate to 1 December 2014, by lump sum the payments for UCLL, SLU and UBA would be approximatively $43 million in aggregate for UCLL, SLU and UBA. If we were to implement smoothed lump sum payments, with the amounts spread over the remainder of the regulatory period the individual payments would have to factor in the discount factor, discussed in Attachment P.

930. If we were to decide to backdate to 1 December 2014 by claw-back, the price increase for UCLL would be $0.77 over the four year remainder of the regulatory period, and for UBA would be $0.03

931. Likewise we will assess if there had been provision made for backdating. If the December 2014 draft price is close to the final price then the backdating will be via a lump sum; if it is greater, then we will consider a composite approach.[445]

932. If RSPs made some provision for backdating, we would consider recovering the backdating amount based on a mixed approach using a lump sum payment mechanism and a claw-back mechanism.

933. Box 1 below illustrates this mixed approach.

934. We are open to submissions on this approach.

Box 1. Illustration of a composite approach

- Assume the total UBA price is backdated from 1 December 2015 to 1 December 2014, and the IPP price is $34.

- If the total UBA price is $38 in our final determination, the increase in the price from the IPP price is approximately $4. If, based on our judgement, RSPs made a provision of $4, the implementation would only be a lump sum payment because the price change equates recent prices by RSPs.

- If the total UBA price increases to $39 in our final determination, the increase in the price from the IPP price is approximately $5. If, based on our judgement, RSPs made a provision of $4, then the implementation could be a lump sum payment based on the $4, and the balance of $1, could be recovered based on a mark-up on the final TSLRIC price over the remainder of the regulatory period. Based on our backdating model, this amounts to approximately $0.30 (ie $0.25 plus interest), if we were to backdate to 01 December 2014 (ie 4 years from 01 December 2015 to 01 December 2019).

- Some RSPs indicated that retail prices were increased by $4 to make a provision for backdating. If the available evidence shows that RSPs increased retail prices by this

444 We note that any decision to implement backdating would only directly apply to regulated services and not services commercially linked to those regulated services.

445 If we were to backdate to December 2012, then the provision to 2014 would be a lump sum and we would consider recovering the remainder by the composite approach.

magnitude, the difference between our further draft total UBA price in year 1 and the IPP price almost equate the provision made by RSPs. For this reason, backdating implementation would mainly be a lump sum payment if the further draft were to apply as the final prices determined in our final determination.

- If we backdate then the backdating implementation relating to the UBA increment and the UCLL price could be calculated separately but the same method would apply to each service.

Implications for smaller RSPs

935. To protect against an RSP exiting the market because of backdating we would consider whether there were circumstance where an RSP should not have to pay a lump sum.

936. We found that the RSPs that would have relatively lower backdating obligations tended to be smaller in general. We consider that requiring smaller RSPs to pay lump sums may result in disproportionately large overhead costs for those RSPs and we anticipate that they may have to borrow money to pay the lump sum. These costs, which may include management time, legal fees, and financial reviews, may collectively represent a significant proportion of the lump sum, even though the lump sum payment itself may be proportionate to the scale of the RSPs' business.

Other practical considerations, if we were to backdate

937. This section illustrates practical considerations that we may have to consider to recover the backdating amount, if we were to backdate.

938. As a starting point, we consider that we have the ability to impose these conditions under the Act (section 49). This is consistent with Justice Harrison's observation in the [Telecom] case.[446]

939. In relation to the applicable terms which would apply to backdating, we note the following:

    939.1 the basis for calculating the backdating amount and lump sum payments are provided in our model and explained in Attachment P to this further draft determination;

    939.2 the interest rate used is also provided in our model and explained in Attachment P to this further draft determination; and

    939.3 it is proposed that we would set other terms and conditions within our powers, such as the payment date.

[446] The practical means of resolving this question would be for the Commission, when delivering its pricing review determination, to impose a condition for repayment by the provider (s 52(b)). Such a condition, including payment of interest, would be available to the Commission unless is elected to exercise rights of appeal. See *Telecom New Zealand Limited vs Commerce Commission & TelstraClear Limited (HC),* 8 April 2005, paragraph 37.

940. We have published our proposed backdating model as part of this further draft determination. The backdating model is mostly an unpopulated model, and only includes volumes for the total market. We invite submissions on our backdating model.

Attachment A: UCLL network footprint and demand

Purpose

941. This Attachment sets out our earlier views, submissions, analysis, and draft decisions relating to the network footprint and demand for UCLL.

941.1 The network footprint determines the number of connections that comprise the access network, and informs where the modelled network will be deployed; and

941.2 The network demand determines the number of connections over which total modelled costs will be spread.

Our draft decisions

942. Our draft decisions are that:

942.1 the hypothetical efficient operator network connects every address along New Zealand's road network;

942.2 the hypothetical efficient operator serves demand for all active fixed line connections;

942.3 there is no demand growth or migration of hypothetical efficient operator connections;

942.4 the hypothetical efficient operator network serves all demand from Day 1; and

942.5 the hypothetical efficient operator does not serve Christchurch Red Zone properties.

Hypothetical efficient operator network connects every address along the NZ road network

943. Our objective, in setting the hypothetical efficient operator's network footprint, is to establish an appropriate scale for the provision of the UCLL service that (in conjunction with demand) results in an average unit cost that meets our TSLRIC objectives and section 18 purpose.

944. TERA notes that the starting point for dimensioning an access network (not only in a cost model, but in the real world), is to dimension it based on the number of address points. This is the "dimensioning demand" or network footprint. However, revenues are only received from active customers, which is the "actual demand". It follows that demand is never equal to the address points the network has been dimensioned to serve. In developed countries, demand is typically equal to 80-90% of address points.

Our earlier views

945. In our December 2014 UCLL draft determination paper, we considered where a hypothetical efficient operator would deploy its network. We reached the view that the hypothetical efficient operator's network footprint should connect (at least) the TSO lines Chorus is obligated to serve, and any additional lines would be connected if a capital contribution could be secured from the end-user. On the assumption that these capital contributions would be forthcoming, we concluded that our hypothetical efficient operator's network footprint should include all copper connections (both inside and outside the TSO-derived boundary we constructed).[447,448]

Submissions

946. In response, Vodafone submitted that:[449]

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

947. Spark provided a similar submission, stating that:[450]

> "…the network coverage boundary for the purposes of the FPP should extend as far as is commercially viable. In other words, it should set non-commercial lines outside of the demand border."

Analysis

948. TERA advises that the reason it is common for the footprint of modelled TSLRIC fixed wired access networks to be greater than demand is that dimensioning a network for the number of possible connections in a given area is much more efficient in the long run since it prevents having to redeploy cables, redig trenches or redeploy poles when actual demand increases and therefore enables significant cost savings, on the basis that this best represents potential demand in the long run.

949. The modelled network footprint for our hypothetical efficient operator is some 9.1% greater than existing active network connections (copper, HFC and fibre).

950. Our earlier views on the modelled network footprint for UCLL focussed on the extent to which our hypothetical efficient operator had either an obligation or other

447 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [489].

448 Our reference to "copper connections" was inconsistent with the UCLL footprint modelled. The modelled UCLL footprint was in fact based on address points within the Corelogic database, as set out in section 3.1 of TERA's Model Specification.

449 Vodafone "Submission to the New Zealand Commerce Commission on process paper and draft pricing review determinations for Chorus' unbundled copper local loop and unbundled bitstream access services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [G4].

450 Spark "UBA and UCLL FPP pricing review draft decision - submission" 20 February 2015, paragraph [209].

commercial incentive to connect and provide service to end-users. Accordingly, the responses we received from Vodafone and Spark encouraged us to determine “commercially viable” and ”economical” lines to serve.

951. A commercially viable line is simply a line that someone is prepared to pay for. This may be our hypothetical efficient operator, the end-user, or some other funding source. We recognise that, in a hypothetical efficient operator context, identifying these lines and who pays requires judgement. This is why we have developed our treatment of capital contributions.[451]

952. Our revised views on the scope of the UCLL network footprint is that the exercise is less about funding, and more about establishing an appropriate scale for the provision of the UCLL service.

953. We consider the UCLL service to be a national service. Accordingly, our modelled network is a national network, and it is efficient that (within the point-in-time modelling requirement of TSLRIC) the network is “built” to accommodate all buildings along New Zealand’s roads.

954. Our best view of the buildings to be connected to the hypothetical efficient operator network was provided by geo-spatial expert, Corelogic. Corelogic provided us with the most comprehensive and complete database of the address and road network available for New Zealand. However, even with the best available data, geo-spatial databases can contain anomalies.

955. Deriving the hypothetical efficient operator’s network footprint from the Corelogic database has necessarily shifted our modelling approach from connecting buildings to connecting address points. The implication of this is that there are likely to be some address points that relate to vacant lots, reserves, and buildings not connected to Chorus’ (or any other fixed) network.

956. Some of these address points may never require a telecommunications service within the regulatory period. Balancing this, however, are single dwelling buildings with multiple connections, such as granny flats and home offices, which have been included in our model as a single address point. We consider the existence of these lines has an off-setting effect on the inclusion of address points without a current building or connection to a fixed network.

957. We note the 9.1% difference between the number of address points used for the network footwork and the number included in the modelled demand is below the range of 10-20% identified by TERA based on its experience of TSLRIC modelling in other jurisdictions. Ultimately, we consider this to be a technical issue on which consider it appropriate to accept the advice of our expert consultants - that the number of address points used in the modelled footprint relative to the modelled demand is well within the parameters they would expect to see.[452]

451 For further discussion on this point, please refer to Attachment K.
452 TERA’s Model Specification paper, section 4.1.1

958. In relation to the vacant site matter, an alternative approach would be to seek to further refine the Corelogic data with a view to identifying those address points that are vacant lots and that are not likely to be built on during the regulatory period. For a balanced approach it would be appropriate to also seek to identify the extent of situations where there are multiple connections at a single address point.[453]

959. Corelogic has suggested that it may be possible to use land use categories derived from their database sets and map these against District Valuation Roll information indicating improvement values and codes, floor areas, wall and roof material and units of use to establish the likely presence of a building.

960. As this was not an issue identified in our December 2014 UCLL draft determination paper or in submissions on that paper, we seek views on the appropriate approach for our modelling.

The hypothetical efficient operator serves demand for all active fixed line connections

961. Our objective, in setting the hypothetical efficient operator's demand (and corresponding network footprint), is to establish an appropriate scale for the provision of the UCLL service that (in conjunction with the network footprint) results in an average unit cost that meets our TSLRIC objectives and Section 18 purpose.

Our earlier views

962. Our December draft determination paper stated that the HFC network was a competing network,[454] but the LFC networks were being replaced (based on our MEA choice).[455] This resulted in demand including Chorus copper, Chorus fibre, and LFC connection volumes. We now think a change is necessary in order to align with our decision framework, which does not distinguish between existing non-Chorus networks (eg, fibre, cable, power etc).[456]

Submissions

963. In response, Chorus stated that:[457]

> "…by spreading the modelled cost for UCLL and UBA across services provided on other infrastructure, the Commission will, in the presence of economies of scale, understate the unit costs of providing the regulated service."

964. Chorus' view was also supported by its experts, Analysys Mason.[458]

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453 This was how the UCLL footprint was modelled in our December 2014 UCLL draft determination paper. We did not receive any submissions raising concerns with the approach taken or suggesting an alternative approach.

454 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [490].

455 Ibid, paragraph [497].

456 Refer to Chapter 1.

457 Chorus "Submission for Chorus in response to Draft pricing review determination for Chorus' unbundled copper local loop service and Unbundled Bitstream Access Services (2 December 2014) and Process and issues update paper for the UCLL and UBA pricing review determinations (19 December 2014" 20 February 2015, paragraph [297].

965. The majority of other submissions received on this matter supported our treatment of LFC demand (ie, to include copper connections residing on LFC networks).[459,460,461,462]

Analysis

966. We have been considering parties' views on demand, and in light of our framework, which assumes existing networks remain in place alongside our hypothetical efficient operator, we now believe it is best to treat demand residing on these other networks in the same way.[463,464]

967. However, having excluded HFC demand and included LFC demand in our December 2014 UCLL draft determination paper, we must now consider whether to include or exclude all non-Chorus demand.

968. As we noted in our December 2014 UCLL draft determination paper,[465] a recent European Commission recommendation states that models should include both copper and NGA lines, and therefore only traffic volume moving to other infrastructures (eg, cable, mobile and alternative operator fibre) would entail an inflation of unit costs, which supports the exclusion of all demand residing on other networks – not just HFC, but LFC and others.

969. However, after further consideration of submissions (notably Chorus' and their experts) and the EC's recommendation, we do not support excluding demand (for cable, or any other competing network) on the basis of competition, if that has the effect of raising the UCLL price. Increasing prices in a competitive market as a response to declining demand is illogical.

458 Analysys Mason "Report for Chorus – UCLL and UBA FPP draft determination cross submission" 20 March 2015, section [2.5].
459 Spark "UBA and UCLL FPP pricing review draft decision - cross submission" 20 March 2015, paragraph [239].
460 Vodafone "Submission to the New Zealand Commerce Commission on process paper and draft pricing review determinations for Chorus' unbundled copper local loop and unbundled bitstream access services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [G5]
461 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [3.1].
462 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand – Review of issues from UCLL and UBA submissions – cross submission for the UCLL and UBA draft determination" 20 March 2015, p. [85].
463 Refer to Chapter 1.
464 The other networks include LFCs (Enable, NorthPower, WEL, UltraFastFibre), mobile (Vodafone, Spark, 2Degrees) and fixed wireless (Vodafone RBI, Woosh, Farmside etc).
465 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [492].

970. We note and accept Professor Vogelsang's comments in relation to the relevant output quantity and coverage support our inclusion of all demand, where he states:[466]

> Since the MEA is both an actual replacement of the copper lines and the hypothetical replacement, the relevant state of demand is that for retail copper access before its decline in demand. This holds to the extent that former copper access subscribers have not vanished but have migrated or are migrating to either mobile or UFB services.

971. Accordingly, we consider that on balance we should include all demand in our UCLL model. This has the result of HFC demand being added to our December 2014 UCLL draft determination paper demand base.

972. We recognise that this approach continues to set a level of demand that is greater than Chorus' existing network demand (copper and fibre) – a point that Chorus and its consultants have raised repeatedly during this process.[467] However, as stated above, our objective is to model appropriate scale for the provision of the UCLL service that (in conjunction with the network footprint) results in an average unit cost that meets our TSLRIC objectives and Section 18 purpose.

973. Consistent with our approach to UCLL network footprint above, we consider that the appropriate scale for the UCLL service is national demand – serving all active fixed line connections.

There is no demand growth or migration of hypothetical efficient operator connections

974. Our modelling assumptions in relation to demand growth and migration are relevant for calculating unit costs over time. We must determine to what extent changes in the market – population growth and/or migration to or away from the network – should be modelled.

Our earlier views

975. In our December 2014 UCLL draft determination paper, we noted that our constant demand assumption (ie, no migration) was efficient because it resulted in a price that covered any piece-meal refurbishment, replacement or expansion of the hypothetical efficient operator's network.[468]

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466 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [23(a)].

467 Chorus "Cross submission for Chorus in response to Draft pricing review determination for Chorus' unbundled copper local loop service and Unbundled Bitstream Access Services (2 December 2014) and Process and issues update paper for the UCLL and UBA pricing review determinations (19 December 2014" 20 March 2015, paragraph [309-312].

468 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [509].

976. We also agreed with Professor Vogelsang's thoughts on this matter, when he advised that:[469]

> TSLRIC is conceptually based on an expanding market, where additional capacity is being installed. Since a large portion of the copper-related costs are sunk and some overcapacities develop, true forward-looking costs will therefore be much lower than TSLRIC as traditionally calculated by regulators. Also in this stage of the market an operator in a competitive environment would wish to take advantage of wholesale demand to defend its position against competing technologies. But if TSLRIC were still measured based on the old technology this would lead to price increases because of the smaller quantity base over which then fixed costs would have to be spread. Summing up, in the face of long-term declining demand relying on the TSLRIC standard for the old technology would induce unnecessary over-capacities and allocative inefficiencies in copper networks.

Submissions

977. There are a number of factors that determine the demand for regulated UCLL. During this process we have heard from submitters on aspects such as population growth, migration to Chorus' UFB network, migration to LFC networks, and fixed to mobile substitution.[470,471,472,473,474]

Analysis

978. Our December 2014 UCLL draft decision to assume constant demand was not because we think these factors are irrelevant considerations, or that their cumulative effect necessarily results in a constant level of demand. We set out below the challenges with assuming non-constant demand as we see them.

979. While we acknowledge Chorus' submission that starting demand should be Chorus' current demand and adjusted based on Chorus' forecasts, [475] we expect that other submitters are likely to have a different view from Chorus. Network Strategies

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469 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 8 September 2014, paragraph [10].

470 Vodafone "Submission to the New Zealand Commerce Commission on process paper and draft pricing review determinations for Chorus' unbundled copper local loop and unbundled bitstream access services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [G7-G12].

471 Spark "UBA and UCLL FPP pricing review draft decision - submission" 20 February 2015, paragraphs [81-85].

472 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraphs [15.9-15.14].

473 Chorus "Cross submission for Chorus in response to Draft pricing review determination for Chorus' unbundled copper local loop service and Unbundled Bitstream Access Services (2 December 2014) and Process and issues update paper for the UCLL and UBA pricing review determinations (19 December 2014" 20 March 2015, paragraphs [313-326].

474 Analysys Mason "Report for Chorus – UCLL and UBA FPP draft determination cross submission" 20 March 2015, section [2.5].

475 Chorus "Submission for Chorus in response to Draft pricing review determination for Chorus' unbundled copper local loop service and Unbundled Bitstream Access Services (2 December 2014) and Process and issues update paper for the UCLL and UBA pricing review determinations (19 December 2014)" 20 February 2015, paragraph [294].

submissions on population growth with CEG's and Analysys Mason's subsequent critique is an example of the differing views on demand factors. [476,477]

980. Network Strategies (supported by Spark,[478] Vodafone,[479] and Wigley and Company)[480] acknowledge the number of fixed lines in New Zealand has been stable since the late 1990s despite the number of households increasing by 19.5% during the same period. However, in conjunction with population projections for both Auckland and Wellington from various local and central government sources, suggest that future population growth will drive significant household fixed line demand, which due to our constant demand assumption will result in mobile-only household growth.[481]

981. On the basis of this analysis, Network Strategies goes on to find that the UCLL cost would decline by 8.5% if population growth was accounted for. However, we note Analysys Mason's and even Network Strategies own submission, [482,483] that an assumption of constant costs is obviously not appropriate and undermines the claimed per unit cost reductions.

982. Even before considering the cost implications raised by Network Strategies, the historic fixed line and population growth trends viewed alongside the other data provided by Network Strategies, do not provide sufficient evidence to support modelling a level of demand above what is proposed in this further draft.

983. New Zealand's population growth is undoubtedly positive, however, this trend has not translated into household fixed line growth on the copper network. It is not clear to us why this trend persists, but it is equally unclear from the data presented to us to date that this trend is likely to break during the regulatory period. Accordingly, we do not support translating population growth into additional modelled UCLL demand.

476 CEG "Issues from submissions UCLL and UBA" March 2015, paragraphs [61-65].

477 Analysys Mason "Report for Chorus – UCLL and UBA FPP draft determination cross submission" 20 March 2015, section [2.5.3].

478 Spark "UBA and UCLL FPP pricing review draft decision - submission" 20 February 2015, paragraphs [81-85].

479 Vodafone "Submission to the New Zealand Commerce Commission on process paper and draft pricing review determinations for Chorus' unbundled copper local loop and unbundled bitstream access services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [G7-G12].

480 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [15.9-15.14].

481 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand – Commerce Commission draft determination for UCLL and UBA – a review of key issues" 20 February 2015, p. 10-16.

482 Analysys Mason "Report for Chorus – UCLL and UBA FPP draft determination cross submission" 20 March 2015, section [2.5.3].

483 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand – Commerce Commission draft determination for UCLL and UBA – a review of key issues" 20 February 2015, p. 21.

984. Conversely, Analysys Mason argues, on behalf of Chorus, that demand for UCLL will decrease as UFB is taken up, and that Chorus' total demand for UFB and UCLL will decline as customers move onto LFC and other networks such as mobile.[484]

985. As discussed earlier in this Attachment, we do not support excluding demand on the basis of competition, since the effect on TSLRIC prices would be contrary to the normally observed effects of competition. Currently, we cannot see how such an approach could be in the long-term benefit of end-users, although we note our expert, Professor Vogelsang, considers such adjustments could be considered.[485]

986. Accordingly, we have maintained our earlier draft decision that there is no demand growth or migration of hypothetical efficient operator connections.

The hypothetical efficient operator serves all demand from Day 1

987. Our modelling assumptions in relation to demand take-up and network utilisation are relevant for calculating unit costs over time. In accordance with our assumption that the hypothetical efficient operator serve all active fixed line demand, we set demand to be equal to that level from the first year of the analysis. We have described this as the "fully-loaded demand assumption".[486]

Our earlier views

988. In our December 2014 UCLL draft determination paper, we noted that (coupled with constant demand) our fully-loaded demand and instantaneous take-up assumptions were efficient because they resulted in a price that covered any piece-meal refurbishment, replacement or expansion of the hypothetical efficient operator's network.[487]

Submissions

989. In response, WIK, on behalf of Spark and Vodafone, states that it fully supports the principle of a fully-loaded network assumption. Vodafone also, separately, provides its support for instantaneous demand take-up, as does Wigley and Company.[488,489,490]

484 Analysys Mason "Report for Chorus – UCLL and UBA FPP draft determination cross submission" 20 March 2015, section [2.5].

485 Vogelsang "Reply to Comments on my November 25, 2014, paper 'Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand'" 16 April 2015, paragraphs [23 and 96].

486 The term fully loaded demand means no more and no less than that we have set demand for first year of our analysis equal to the sum of copper, fibre and HFC fixed line subscribers as at August 2014.

487 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [509].

488 WIK-Consult "Submission in response to the Commerce Commission's 'draft pricing review determination for Chorus' unbundled bitstream access service' and 'draft pricing review determination for Chorus' unbundled copper local loop service' including the cost model and its reference documents" 20 February 2015, paragraph [413].

489 Vodafone "Submission to the New Zealand Commerce Commission on process paper and draft pricing review determinations for Chorus' unbundled copper local loop and unbundled bitstream access services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [G7].

Analysis

990. We continue to hold the view that (coupled with constant demand) our fully-loaded demand and instantaneous take-up assumptions are efficient because they result in a price that covers any piece-meal refurbishment, replacement or expansion of the hypothetical efficient operator's network.

The hypothetical efficient operator does not serve Christchurch Red Zone properties

991. As we set out in our December 2014 UCLL draft determination paper,[491] there are about 8,000 properties within the Residential Red Zone that are either vacant or will shortly be vacated (based on data from Corelogic NZ Limited). Once these properties have been vacated any remaining buildings will be demolished.

992. Based on CERA's assessment, the land is unlikely to have significant building undertaken within the regulatory period. Consequently, the UCLL demand within the Christchurch Earthquake Residential Red Zone area is deemed to be zero for the purposes of our modelling.

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490 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [3.1].

491 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [514-515].

Attachment B: Selecting the MEA for the UCLL service

Purpose

993. This Attachment sets out our considerations, and responds to submissions from interested parties, on our selection of the MEA for the UCLL service.

Our draft decisions

994. We have taken a "core functionality" approach to determine the service that the MEA technology must be capable of providing. Our view is that the "core functionality" approach allows us to model an equivalent service that best meets our TSLRIC objectives and the requirements of the Act. This approach allows us to identify and optimise the UCLL service and therefore determine, for the purpose of the hypothetical efficient operator, the efficient forward-looking incremental costs it would face in providing the service.

995. In our view, an efficient replacement for a copper network would not necessarily allow for layer 1 access by access seekers across the whole network. While we acknowledge that access to layer 1 services allows competition and provides choice for end-users, which is in accordance with the section 18 purpose, we consider that it is not necessary for the hypothetical efficient operator to provide this level of functionality across the whole network.

996. Therefore, we remain of the view that the "core functionality" of the service is simply to allow access seekers to provide voice and broadband service to end-users. We consider it is reasonable to assume that the hypothetical efficient operator, entering the market would have certain regulatory obligations placed on it in this regard, so we also consider that the MEA should be able to provide, to a large extent, a point-to-point, unbundleable layer 1 service.

997. In this context, we have considered which technologies the hypothetical efficient operator would deploy that would allow it to meet its regulatory obligations. Where the capability of Chorus's copper access network means that end-users can receive voice-only or low-speed data services, we consider that a replacement network that provides unbundleable, point-to-point service provides significantly more capability than required, and that this would not be an appropriate MEA. Accordingly, the unbundleability and point-to-point features of the MEA network are not required throughout the whole network and we have considered Fixed Wireless Access (FWA), as the appropriate alternative technology, for lines that we identify as low capability lines.[492]

998. In our view a hypothetical efficient operator replacing the existing copper network would ensure it deploys the most future proof technology, which in our view is a Fibre to the Home (FTTH) network, with FWA on the edges of the network. Therefore, having regard to the "core functionality" and the other key features that we consider the MEA technology should be capable of providing, such as

[492] For further details on our approach to FWA modelling, see Attachment D.

unbundleability and a point-to-point connection, it is our view that a hypothetical efficient operator would be likely to deploy a point-to-point FTTH network, given its longer useful life and its additional capability, which limits the likelihood of obsolescence.

Analysis

Our framework for determining the MEA for the UCLL service

999. Having decided to use the concept of a MEA to model the TSLRIC costs of providing the UCLL service, we must now determine that MEA.

1000. In our December 2013 UCLL process and issues paper, we suggested that TSLRIC requires us to model a hypothetical network that "as a minimum, should provide the same functionality as the existing UCLL service".[493] As we explain in this section, we no longer hold that view.

1001. Chorus has submitted that our choice of MEA is limited by the words “the service” in the Act’s definition of “TSLRIC”, and that we are therefore constrained to a MEA that has the same functionality as Chorus’ actual copper network.[494]

1002. We consequently sought legal advice on that point, on which we consulted. Dr James Every-Palmer’s advice of 12 March 2014 summarised the various interpretations as follows:[495]

> In my view, there are four candidate interpretations for the phrase “the service” in terms of the application of the TSLRIC concept:
>
> (a) the actual service provided by Chorus;
>
> (b) the service described in the relevant STD;
>
> (c) the designated access service as described in Schedule 1; or
>
> (d) a more abstract description of the regulated service that is technology neutral and captures its core functionality.

1003. Dr Every-Palmer went on to prefer option (d) above, on the basis that it is supported by a mix of contextual and purposive indicators in the Act.[496]

1004. In our July 2014 regulatory framework and modelling approach paper, we expressed a view that we intend to consider the efficient cost today for an equivalent service, unconstrained by Chorus’ (or end-users’) historic technology choices, but capturing

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[493] Commerce Commission “Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle” 6 December 2013, paragraph [96].

[494] Chorus "Submission in response to the Commerce Commission’s Process and issues paper for determining a TSLRIC price for Chorus’ unbundled copper local loop service in accordance with the Final Pricing Principle" 14 February 2014, paragraph [11].

[495] James Every-Palmer “FPP determination: Issues re service description and the modern equivalent asset - a report prepared for the Commerce Commission” 12 March 2014, paragraph [13].

[496] Ibid, at paragraph [16].

the "core functionality" of the regulated service.[497] This approach is what Dr. Every-Palmer states as interpretation (d) – that is, a more abstract description of the regulated service that is technology neutral and captures its "core functionality". The term "core functionality" refers to the essential features of the relevant service, rather than the full functionality of the core network (being the part of the network used by multiple services). In this respect, we note that the existing functionality of the network may or may not be efficient.

1004.1 Chorus' submission recorded its disagreement with Dr Every-Palmer's view. Chorus continued to submit that we must model a service that focusses heavily on the functionality and technology of its existing network.[498] This is consistent with Chorus' broader preference on the nature of our cost modelling exercise, which is to base our modelling closely on its actual network.

1004.2 The interpretation preferred by Chorus focusses closely on the literal words of the Act's definition of TSLRIC, in particular "the facilities and functions that are directly attributable to, or reasonably identifiable as incremental to, the service". These words lead Chorus to focus heavily on the functionality of its existing network, and conclude that the MEA must be capable of delivering the full functionality of the existing STD service, not just its "core functions". Chorus submitted that concepts like "core functionality" do not appear in the Act and cannot be read in.[499]

1004.3 CallPlus took a similar view, suggesting that the modelling of the UCLL service (and UBA service) should be based on the existing footprint of commercially available DSL services, which in its view is consistent with the purpose and context of the Act.[500]

1005. In the December 2014 UCLL draft determination paper we noted that we found these submissions unsupported by the statutory language, context and broader scheme of the Act, and therefore unpersuasive.[501] As Dr Every-Palmer suggested, if such an interpretation of the Act was intended, we would have expected Parliament to be clear and unequivocal that this was its intent.

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497 Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [105].

498 Chorus "Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014)" 11 April 2014, paragraphs [58-67].

499 Chorus "Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014)" 11 April 2014, paragraphs [9-11], [58] and [61].

500 Orcon and CallPlus "Submissions by CallPlus and Orcon following the further consultation paper and the workshops" 11 April 2014, paragraph [2.11].

501 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [257].

1005.1 Our view, consistent with submitters other than Chorus and CallPlus, was that Parliament intended us to undertake a TSLRIC exercise by building a TSLRIC cost model to determine the costs incurred by a hypothetical operator using the most efficient means at any point in time to provide the service.[502] As Spark put it:[503]

> The difficulty with Chorus' and Callplus' proposed approaches is that, by tying the MEA tightly to characteristics of the current Chorus network and the way in which Chorus provides services today, it artificially bounds the scope for Commission's assessment of efficient costs. This means the Commission can't set a price that best reflects FPP or section 18 outcomes.

1005.2 Accordingly, we concluded that TSLRIC did not require us to be constrained in our modelling choices by Chorus' existing network.

1006. Consistent with its earlier submissions, Chorus submitted that the MEA should be capable of delivering the full functionality of the UCLL STD service.[504] Chorus suggested that an approach that focusses on "core functionality" introduces a significant element of subjectivity, and therefore unpredictability, into the TSLRIC exercise.[505]

1007. It is our view that based on the TSLRIC exercise we are undertaking we are required to make a judgement about what the service is that we are modelling. We consider Chorus' approach at odds with the purpose of a TSLRIC exercise: to constrain the choice of MEA to a subset of modern equivalents because of features of access to Chorus' historic network is contrary to the forward-looking exercise required by the Act. Accordingly, our view is that the "core functionality" approach allows us to model an equivalent service that best meets our TSLRIC objectives and the requirements of the Act. This approach allows us to identify and optimise the UCLL service and therefore determine, for the purpose of the hypothetical efficient operator, the efficient forward-looking incremental costs it would face in providing the service.

502 See for example Telecom "UCLL and UBA FPP: further consultation and supplementary paper - Submission" 11 April 2014, p. 1; Orcon "Cross submission on the further consultation on issues relating to Chorus' UCLL and UBA services" 30 April 2014, paragraph [7.4]; Telecom "UCLL and UBA FPP: further consultation and supplementary paper - Cross submission" 30 April 2014, p. 2 and paragraph [31].

503 Telecom "UCLL and UBA FPP: further consultation and supplementary paper - Cross submission" 30 April 2014, paragraph [15].

504 Chorus Submission on Draft UBA and UCLL pricing review determinations, CONFIDENTIAL, 20 February 2015, paragraph [358].

505 Chorus Submission on Draft UBA and UCLL pricing review determinations, CONFIDENTIAL, 20 February 2015, paragraph [361].

Selecting the MEA for the UCLL service

1008. Having decided that the MEA must be capable of providing the "core functionality" of the UCLL service, we now set out our view of what we consider to be the "core functionality".

1009. In our December 2014 UCLL draft determination paper we stated our view that the service we model must allow an access seeker to provide voice services and broadband services to end-users.[506] That is, the service must allow end-users to send and receive traffic.

1010. We also noted that we had given weight to other network features, such as point-to-point and the ability to unbundle at layer 1, in selecting our MEA.[507] While we gave weight to those features, we noted that we did not consider them to be determinative for our MEA selection.

1011. Chorus submitted that if the concept of "core functionality" was to be used, then the core functionality needed to be correctly defined.[508] In Chorus' view, our definition of "core functionality" omitted to define the layer at which the service is provided. Chorus then provided its alternative definition of "core functionality:[509]

> The core functionality of the service is therefore best described as a physical connection providing a point-to-point transmission *medium* between the end-user and a hand-over point which enables RSPs to utilise their own equipment to provide a voice and data communications service to end-users.

1012. Our view is that Chorus' definition of "core functionality" identifies features that the MEA network, to some extent, should be capable of providing. However, we consider Chorus' definition to be too restrictive for the purpose of our TSLRIC exercise. An efficient replacement for a copper network would not necessarily allow for layer 1 access by access seekers across the whole network. While we acknowledge that access to layer 1 services allows competition and provides choice for end-users, which is in accordance with the section 18 purpose, we consider that it is not necessary for the hypothetical efficient operator to provide this level of functionality across the whole network.

1013. However, we consider that it is reasonable to expect that to some degree a hypothetical efficient operator entering the market would be subject to regulatory obligations. Therefore we consider it appropriate, given the section 18 purpose statement, that if there were to be a ubiquitous network rolled out, that it would have to allow access seekers to be able to unbundle in order to provide facilities

[506] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [529].
[507] Ibid, paragraph [530].
[508] Chorus, Submission on Draft UBA and UCLL pricing review determinations, CONFIDENTIAL, 20 February 2015, paragraphs [368-371].
[509] Chorus, Submission on Draft UBA and UCLL pricing review determinations, CONFIDENTIAL, 20 February 2015, paragraph [370].

based competition on most lines. On these lines, we consider fixed line technologies to be the appropriate MEA for the UCLL service.

1014. Therefore, we remain of view that the core functionality of the service is simply to allow access seekers to provide voice and broadband service to end-users. We also consider that the MEA should be able to provide, in the main, a point-to-point, unbundleable layer 1 service.

1015. In this context, in order to determine the MEA we need to consider which technologies the hypothetical efficient operator would deploy that would allow it to meet its regulatory obligations. Network Strategies, for Spark and Vodafone, submitted that an efficient operator would utilise FWA in areas of low line density, which would produce a far wider footprint than the RBI footprint.[510] In our view, deploying FWA to the extent proposed by Network Strategies is unlikely to meet the requirement to deploy an equivalent replacement network. Alternatively, Analysys Mason observed that in overseas models FWA is restricted to lines that are not capable of providing a broadband service. We consider this approach to be restrictive as FWA is likely to be capable of providing an equivalent service to what is currently received.[511]

1016. Where the capability of Chorus's copper access network means that end-users can receive voice-only or low-speed data services, we consider that a replacement network that provides unbundleable, point-to-point service provides significantly more capability than required, and that this would not be an appropriate MEA. Accordingly, the unbundleability and point-to-point features of the MEA network are not required throughout the whole network and we have considered alternative technologies, such as FWA, for lines that we identify as low capability lines.[512]

1017. Wigley and Company submitted that we chose P2P as the MEA as GPON cannot be unbundled.[513] Wigley and Company submitted that this is contrary to the Act, which specifically envisages GPON unbundling.

1018. We note that we did not exclude GPON as a MEA candidate in the December draft. Following our consideration of the MEA factors set out above we stated that we preferred to model a fibre network. Then, noting that we had given additional weight to technologies that provide a point-to-point connection and unbundleability, we selected a point-to-point FTTH network. That is, our decision was not made solely on the basis of unbundleability.

510 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Modelling Fixed Wireless Access" CONFIDENTIAL, 20 February 2015, pp. 11-12. See also Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [40] and Vodafone, Submission on Draft UBA and UCLL pricing review determinations, CONFIDENTIAL, 20 February 2015, paragraph [E1.4].

511 Using a modern technology such as LTE or LTE advanced.

512 For further details of our approach to modelling FWA, see Attachment D.

513 Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraph [14.1].

1019. We recognise that a point-to-multipoint GPON network can be unbundled at layer 1. However, as we have set out above, we now consider that the MEA technology must be provided over a point-to-point architecture. Given GPON is provided over a point-to-multipoint architecture, we no longer consider it eligible for consideration as the MEA for the UCLL service.

1020. In our December 2014 UCLL draft determination paper, following advice from TERA, we considered the following factors in determining which eligible technology we would select as the MEA for the UCLL service:

1020.1 technological performance;

1020.2 cost;

1020.3 operator strategy; and

1020.4 subscriber and retail price.[514]

1021. A number of parties have criticised our application of the above factors in determining the MEA for the UCLL service, for example:

1021.1 Analysys Mason has previously submitted that TERA placed considerable weight on operator strategy and that it did not believe that operator strategy was correct as a means of selecting the MEA, or consistent with the choice of the most efficient technology to provide the UCLL service according to a specified list of criteria.[515]

1021.2 Spark submitted that our analysis of operator strategy amounted to a description of the decisions made by incumbent operators in New Zealand – which are a product of contractual arrangements and subsidies provided by the Government. Spark concluded that real world considerations, such as the UFB and RBI rollouts, are only relevant to the extent they are efficient.[516]

1022. We consider that we are primarily guided on our selection of the MEA technology by our above "core functionality" considerations, and that the additional factors above provide limited additional guidance.

1023. However, we note Spark's submission regarding operator strategy that a hypothetical efficient operator would not be limited to a single national network.

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514 Although we noted that we gave little weight to this factor given the uncertainty of retail pricing and consumer preferences.

515 Analysys Mason "Report for Chorus - Response to Commission consultation on regulatory framework and modelling approach for UCLL and UBA" 6 August 2014, p. 9.

516 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [239].

Spark submits that an efficient operator would connect to the lowest cost, fit for purpose, access network to provide services to customers.[517]

1024. In our view a hypothetical efficient operator replacing the existing copper network would ensure it deploys the most future proof technology, which in our view is a FTTH network, with FWA on the edges of the network. In this regard, we note WIK's earlier submission supporting the use of a point-to-point FTTH network:[518]

> We support the use of a P2P topology for the fibre network as the basis for the FTTH model because this is the most flexible and future-proof architecture which also meets the fibre unbundling requirements in New Zealand at a later stage.

1025. Therefore, having regard to the "core functionality" and the other key features that we consider the MEA technology should be capable of providing, such as unbundleability and a point-to-point connection, it is our view that a hypothetical efficient operator would be likely to deploy a point-to-point FTTH network, given its longer useful life and its additional capability, which limits the likelihood of obsolescence.

1026. On lines where unbundleability and point-to-point connection factors are not necessary, we consider FWA to be the MEA technology. As explained above, for these lines we consider that a fixed line solution would be inefficient, and therefore prefer to model a wireless solution. In reaching our view we note TERA's advice that FWA is superior to mobile since it allows more stable download speeds.[519]

1027. However, we recognise that the MEA should identify the efficient costs of providing the UCLL service. Given a fibre MEA possesses higher technological capability than the existing copper network we consider whether an adjustment to the cost of the fibre is required in the following section.

MEA adjustment

1028. In the December 2014 UCLL draft determination paper our view was that we would adjust the cost of our FTTH/FWA MEA if the Fibre to the Node (FTTN) network was less costly than the FTTH/FWA network in order to reflect the different capabilities of the network.[520]

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517 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [254].

518 WIK-Consult "Report for Telecom New Zealand and Vodafone New Zealand - Submission - In response to the Commerce Commission's "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)"" 5 August 2014, paragraph [24].

519 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Modern Equivalent Assets and relevant scenarios" July 2014, p. 25.

520 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [558].

1029. We also noted that we had rejected a MEA adjustment on the basis of consumer preference or technological performance as both would be difficult to estimate in practice and would likely introduce a degree of unpredictability.[521]

1030. Vodafone agreed with our decision to model both a fibre and copper-based network, to enable a downward adjustment if the copper-based network proved a lower cost solution.[522]

1031. As noted above, Spark submitted that the cost of the alternative networks should be considered on an exchange-based level.[523] In response, Chorus submitted that the lowest cost network should be selected as the MEA, and if we decide to select the MEA on an exchange-based level, then operating expenditure should be increased to reflect the additional support systems of operating multiple platforms.[524]

1032. Our view remains that the MEA is FTTH/FWA. It is, in our view, clearly what a hypothetical efficient operator would deploy now to provide the "core functionality" that we discuss above. TERA's advice is that conventional TSLRIC practice is to adopt a single MEA.

1033. However, we recognise that a copper-based UCLL service could have lower capital costs in some parts of the network. Our further draft decision is to make no adjustment for this lower capital cost, or for the offsetting higher operating costs that would be required if the hypothetical efficient operator actually built a mixed network.

1034. TERA is not aware of any regulator undertaking TSLRIC determination of prices by modelling a network with FTTH in some exchange service areas and FTTN in others. We welcome submissions on the appropriate way to apply TSLRIC cost modelling to a notional network that is not the MEA. In particular, how could the operating costs of a network with FTTH in some exchange areas and FTTN in others be modelled consistent with conventional TSLRIC practice?

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521 Ibid, paragraph [567].

522 Vodafone, Submission on Draft UBA and UCLL pricing review determinations, CONFIDENTIAL, 20 February 2015, paragraph [D1.1].

523 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [254].

524 Chorus Cross submission on Draft UBA and UCLL pricing review determinations, CONFIDENTIAL, 20 March 2015, paragraphs [78-80].

Attachment C: Network optimisation

Purpose

1035. This Attachment sets out our further draft decisions on the:

1035.1 degree of optimisation in the access model;

1035.2 optimisation of exchange buildings in the model; and

1035.3 use of private roads, motorways, access ways and railway corridors in the model.

Our further draft decisions

Degree of optimisation

1036. Optimising on a scorched earth basis by eliminating or moving nodes essentially amounts to shifting cost between the access network and the core network, but may not change the total costs of the network materially. Accordingly, we have adopted an optimally structured network approach which is constrained only by the existing number of exchanges and cabinets in Chorus' copper network and their existing locations, and follows the road network. All other aspects are open to optimisation.

1037. We have implemented minor modifications to the exchange boundaries of Chorus' copper network to take into account the location of notional exchanges and network connectivity constraints imposed by the adoption of a theoretical network that is based on the road network.

1038. We have redefined the MDF coverage areas by computing them using a Voronoï algorithm instead of using the existing MDF coverage areas in Chorus' copper network.

Optimisation of exchange buildings

1039. We have modelled the size of exchange buildings based on a bottom-up calculation of the required space and equipment.

1040. Where available, we have used data provided by Chorus to complement the bottom-up calculation to model the most efficient deployment.

Treatment of private roads and motorways

1041. The model includes use of motorways as, in our view, a hypothetical efficient operator would be likely to make use of motorways where it is efficient to do so. Our model has also made use of private roads on the basis that a hypothetical efficient operator would pay consent costs and obtain access to lay fibre on private land where efficient to do so.

Degree of optimisation

Submissions

1042. In December 2013 we set out the following approaches to optimising the modelled network:[525]

1042.1 No optimisation (which occurs in a top-down or bottom-up approach). Under this option, the number, location, topology and function of exchanges and cabinets in the current network are retained in the analysis. Additionally, the existing network infrastructure (for instance ducts and poles) is also retained and the network is not optimised to reflect projected demand.

1042.2 Complete optimisation (“scorched earth”). Under this option, the network is fully optimised. This scorched earth approach allows complete redesign of the network, without considering any past investment and existing node locations/numbers. However, this approach may not reflect a number of real world issues such as the sunk costs and the irreversible nature of some of the investments that the regulated operator has made (for example, the number and the location of local exchanges).

1042.3 Scorched node optimisation. This approach lies midway between the previous two options. Under this option, the number, locations and functions of major network nodes (eg, exchanges) are left as they are. The access network is then optimised with respect to the number, location and function of the minor nodes (eg, cabinets) and the efficient routing and dimensioning of the local access network between these points and end-users’ premises. There is therefore some degree of trade-off between efficiency and real world/historic investment considerations.

1042.4 Modified scorched node optimisation. This option is a variant of the scorched node approach. Under this approach, there is a greater degree of flexibility on the level of network scorching that occurs.

1043. We noted that a modified scorched node approach is widely used internationally by regulators. The approach has significant practical advantages as it corresponds to a more realistic efficiency standard and acknowledges (to a degree) real world investment decisions made by the network operator, while allowing for optimisation where efficiencies can be identified. It also allows for a greater degree of flexibility in approach.[526]

1044. In response to our December 2013 paper, Wigley and Company for Orcon submitted that the Act requires us to model the MEA using a scorched earth approach, as any other approach would not reflect forward-looking costs.[527]

[525] Commerce Commission “Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle” 6 December 2013, paragraph [93].

[526] Commerce Commission “Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle” 6 December 2013, paragraph [95].

[527] Wigley and Company "UBA AND UCLL FPP Price Review Determinations – Memorandum for Cross submissions on behalf of Orcon" 30 April 2014, paragraphs [2.1]-[2.26].

1045. In our December 2014 UCLL draft determination paper we stated that we considered both a scorched node and modified scorched node level of optimisation to be consistent with "forward-looking". In particular, both approaches estimate the forward-looking costs that a network operator would incur if it built a new network today using assets collectively referred to as the MEA.[528] Neither approach says anything about the costs of those parts of the network that are considered immovable.

1046. We therefore disagreed with Wigley and Company and found that the Act afforded us discretion in the degree of optimisation built into the model.

1047. Our view was that while a scorched earth approach is also consistent with a forward-looking approach, we preferred the modified scorched node approach as better suited to meet our TSLRIC objectives. In particular:

1047.1 a scorched earth approach may set an unrealistic standard for incremental build-outs for which a modified scorched node approach is better suited. Given a national roll-out is less likely than an incremental build, we consider that a modified scorched node approach is likely to better promote efficient investment; and

1047.2 regulators in other countries have also typically adopted a scorched node or modified scorched node approach.[529] In our view, a modified scorched node approach therefore better aligns with our TSLRIC objective of predictability, including the fact that it is an orthodox approach.

1048. Accordingly, we adopted a modified scorched node approach for the modelled network and we defined this as meaning modelling an "optimally structured network" which is constrained by the existing number of nodes and their existing locations and follows the road network.[530] In our view, this strikes an appropriate balance of the considerations described above when considered in light of our TSLRIC objectives.

1049. In its submissions on our December 2014 UCLL draft determination paper, Chorus generally supported the use of the modified scorched node approach as being consistent with orthodox TSLRIC.[531]

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528 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop hypothetical efficient operator service" 2 December 2014, paragraph [577-578].

529 Commerce Commission "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" 6 December 2013, paragraph [94].

530 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [579].

531 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [91].

1050. Chorus did however raise three concerns regarding the level of optimisation:[532]

1050.1 Modelling exceeds network deployment guidelines.

1050.2 Modelling makes no provision for spare capacity in the fibre model.

1050.3 Modelling assumes the availability of motorways and private roads for network deployment, without accounting for the additional costs of access.[533]

1051. Analysys Mason for Chorus found the scorched node assumption appropriate, as it is very commonly used in regulatory cost models and retains the existing points of interconnection and the current definition of the access network boundary.[534]

1052. Analysys Mason agreed with Chorus that our modelling exceeds network deployment guidelines and recommended that the fibre architecture should be revised to minimise the opportunity for unacceptably serious single point of failure.[535]

1053. Spark also agreed that a modified scorched node approach is a common approach taken by regulators internationally and supported its application.[536]

1054. While Spark agreed to the use of the modified scorched node approach, it found that more should have been done to optimise the model network and listed the following areas where it disagreed with our approach:[537]

1054.1 Optimisation of exchange service area boundaries.

1054.2 Shortest path algorithm.

1055. We address this submission in paragraphs 1076-1083 below.

1056. Spark also argued that the use of modified scorched node means that we should value re-usable asset at DORC. Please refer to Attachment E on asset valuation which addresses this point and to the analysis below.

1057. WIK submitted that the use of existing ODF locations in the FTTH network and of the existing sites of the FWA only make sense if the Commission assumes a re-use of

532 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [93].

533 As this submission relates to the use of motorway and private roads, it will be addressed later in this Attachment.

534 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross submission" CONFIDENTIAL, 20 March 2015, p. 7.

535 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 26.

536 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [59].

537 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [59a-b].

assets.[538] As with Spark's similar submission on asset re-use, we address this submission as part of our draft decision of asset valuation.

1058. WIK also disagreed with our decision not to optimise the exchange service area boundaries and found that our use of the shortest path algorithm should be replaced by an augmented shortest path algorithm, which minimises trench cost rather than simple cable length.[539]

1059. Vodafone submitted that a proper application of a scorched node (or modified scorched node) approach would permit some optimisation of exchanges, such as changing the MDF/ODF boundaries, modifying the number of ODFs/MDFs and modifying the number and location of street cabinets in the copper-based network.[540]

1060. Wigley and Company found that – given the constraints of scorched node approach – the TERA model route length algorithm appeared appropriate and provided appropriate optimisation.[541]

1061. Wigley and Company generally found that the use of the scorched node approach enables widespread use of re-usable assets and that we therefore were inconsistent in our December 2014 draft decision, where assets were not re-used.[542] As with Spark's similar submission on asset re-use, we address this submission as part of our draft decision of asset valuation.

1062. We have also received a large number of submissions addressing very specific and technical details relating to the actual dimensioning of the network. We have discussed these "technical" submissions with TERA. Responses to these points are set out in TERA's review of submissions and have therefore not been included in this Attachment.[543] We have reviewed this document and we agree with TERA's responses to the submissions made.

Analysis

1063. Following submissions and cross submissions we have further considered the nature of our hypothetical efficient operator and how this impacts our choice of network optimisation.

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538 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [62].

539 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [113-116].

540 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [D5.2].

541 Wigley and Company "Submission on backdating in relation to draft UCLL and UBA pricing review determinations" 20 February 2015, paragraph [3.1].

542 Wigley and Company "Submission on backdating in relation to draft UCLL and UBA pricing review determinations" 20 February 2015, paragraphs [12.1-12.4].

543 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Analysis of the industry comments following the December 2014 draft determinations" June 2015.

1064. As defined in Chapter 1, our hypothetical efficient operator operates in a world where Chorus' copper does not exist in its current form. Our hypothetical efficient operator is therefore not constrained by the legacy decisions of Chorus.

1065. However, as also explained in Chapter 1, real world information, and indeed that reflecting the legacy decisions of Chorus, may be used to inform our assessment of what constraints a hypothetical efficient operator would be likely to face and decisions it would be likely to make.

1066. We accept that this position would theoretically lead to a scorched earth approach being our starting point for network optimisation rather than a modified scorched node approach. However, we do not agree that optimising on a fully scorched earth basis would necessarily lead to lower costs.

1067. This is because optimising on a scorched earth basis by eliminating or moving MDFs simply amounts to shifting cost between the access network and the core network. This may not materially reduce the total costs of the network as each end-user will still have to be connected back to the node and from the node further back in the network.[544]

1068. The reason for this is as follows:

1068.1 Optical fibre can reach significantly longer than copper cables, so a scorched earth optimisation utilising this greater reach would likely have fewer MDFs.

1068.2 But as the number of MDFs decreases, the average length of the local access increases, and therefore so does the average cost. The total cost of the network may not be changing materially, because a cable down every street is still needed. Instead costs are being transferred from the core network which is not part of the UCLL-service to the local access network (which is part of the UCLL-service).

1069. This is illustrated by considering two extremes:

1069.1 Only one single national MDF exists. The cost of connecting every end-user to this MDF is included in the UCLL price. The cost of capacity from every town in New Zealand to the MDF has now been transferred from the core network to UCLL. This will clearly lead to a very high UCLL price.

1069.2 One MDF exists at the boundary of each end-user. UCLL therefore only consists of a lead-in cable and a terminal. This will obviously lead to a very low price for UCLL.

1070. Accordingly, in these circumstances there is no real optimisation taking place. Rather, we have to make a judgement call as to how much of the link between the access seeker and the end-user is included in UCLL.

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[544] James Allan from Analysys Mason made a similar argument at the conference: Commerce Commission, "UBA and UCLL pricing review determination conference transcript", 15-17 April 2015, p. 84.

1071. This analysis tells us that a scorched earth approach to modelling the UCLL network does not amount to optimisation in an efficiency sense. Changing the number of "handover points" simply shifts how much of the link from the end-user to the access seeker is included in UCLL and how much is included in UBA. The whole link must be present for the service to be provided. Further, we note that it is only the locations of these MDFs that we are treating as fixed. We have considered the case for optimisation of all other aspects of those MDFs.

1072. We also consider that there are a number of other factors which support the case for keeping the MDF locations fixed, as follows:

1072.1 The current node placement provides a good indication of the network design constraints that a hypothetical efficient operator would face, as we have no reason to believe that Chorus' network was deployed inefficiently. It can therefore reasonably be assumed that the locations of the nodes kept constant in our model are, by and large, efficient.

1072.2 Deploying a network based on scorched earth involves a great deal of technical uncertainty which requires large judgement calls leading to larger risk of regulatory error.

1072.3 Optimisation based on the existing nodes is a commonly accepted modelling interpretation of TSLRIC and we are not aware of any jurisdictions where a scorched earth approach to optimisation has been used.

1073. For the reasons given above, we consider our optimally structured network approach to represent only a limited (but necessary) compromise to the scorched earth concept.

1074. Having decided on this approach to optimisation, we disagree that the number and location of exchanges and street cabinets should be optimised.

1075. Following consideration of submissions, we agree that a number of optimisations can be made under our applied approach. In particular, we agree that the exchange service area boundaries and the shortest path algorithm potentially can be optimised.

1076. We have therefore calculated the effect of redefining the MDF coverage areas by using a Voronoï algorithm instead of using Chorus coverage areas.[545] We have also calculated the effect of optimised paths through minimising the length of the trench network instead of the length of each line.

1077. By using the Voronoï algorithm, the total network area has been divided into smaller coverage areas based on the shortest distance to the location of the MDFs. The result is that for each MDF there is a corresponding coverage area consisting of all address points closer to that MDF than to any other MDF.

[545] A Voronoï algorithm divides an area into regions based on distance to points in a specific subset of the area. That set of points is specified beforehand, and for each point there is a corresponding region consisting of all locations closer to that point than to any other.

1078. Optimising the MDF coverage areas results in lower total network costs and we consider that a hypothetical efficient operator would follow this approach. We have therefore implemented the new MDF coverage areas in the updated model.

1079. We have also tested the impact of changing the shortest path algorithm in line with the submissions, which suggested using an augmented algorithm.

1080. The aim of the shortest path algorithm used in our December 2014 UCLL draft determination paper was to derive the shortest path between each address point and its parent MDF. This includes building new trenches if needed.

1081. The aim of the augmented algorithm is to avoid building new trenches in order to minimise the length of the trench network. The distance between the building and its parent MDF is potentially longer than with the original shortest path algorithm leading to more cables, joints and ducts to be installed.

1082. Naturally, we found that the augmented algorithm does decrease the length of the trench network and therefore the total trenching cost of the network.

1083. However, we also found that the augmented algorithm leads to more cables, joints and ducts needed to connect each building and therefore higher costs for this part of the network. The combined effect of a shorter trench network but more cables, joints and ducts leads to higher total network costs. This approach is therefore unlikely to be followed a hypothetical efficient operator and we have therefore decided not to change our calculation of the shortest path.

1084. We agree with Chorus and Analysys Mason that our modelling has resulted in cases where a trench contains more than 5,000 fibres and therefore exceeds the design guidelines mentioned by Chorus as it creates an unacceptable single point of failure in the network. We have therefore decided to include the costs of reinforcing those trenches which contain more than 5,000 fibres.

1085. The updated trenching costs analysis from Beca includes the costs of reinforcing.

1086. We do not agree with Chorus that a provision for (additional) spare capacity in the fibre model should be made.

1087. The size of cables is discrete and almost never matches exactly the actual demand and therefore always includes spare capacity. For example, if demand is 45, a cable with 50 fibres will be deployed (because there is no cable with 45 fibres) and the spare capacity will be 10%.

1088. As such, we find that the fibre model already includes sufficient spare capacity.

Optimisation of exchange buildings

Submissions

1089. In our December 2014 UCLL draft determination paper we stated that as a consequence of network equipment becoming smaller in size and exchange equipment no longer being used by Chorus, a number of Chorus' buildings would not be fully utilised leaving empty space within the buildings. This raised the issue of whether to maintain the size of Chorus sites to reflect the historical deployment or to model optimised sites that reflect what a hypothetical efficient operator would deploy, given the modern equipment available.

1090. Modelling the actual size of Chorus' sites and basing the cost on this is equivalent to a top-down approach to costing buildings, where the costs are based on the cost of the actual buildings and on Chorus providing a service it no longer provides (PSTN-voice).

1091. We considered that adopting this approach is likely to overestimate the cost for a hypothetical efficient operator, as it will include costs which are not relevant given the modern equipment available and the services provided. In addition, we would expect that with ongoing technological development these larger sites would not be required.

1092. Accordingly, we adopted a bottom-up approach to model the size of buildings based on the modelled demand of the services provided and the modern equipment required to provide those services. We considered that this approach was consistent with how a hypothetical efficient operator would dimension exchange buildings.

1093. We also used data provided by Chorus regarding relevant modern sites consisting of blueprints of a number of sites and linking their current sites with the relevant modern buildings. Where available, TERA drew on this information to determine what, in its expert opinion, is the most efficient deployment.

Analysis

1094. We have not received any submissions regarding the optimisation of the size of exchange buildings.

1095. We therefore still find that a bottom-up approach which has been tested against actual dimensioning rules for modern sites provides the best indication of how a hypothetical efficient operator would build its exchange buildings.

Use of private roads and motorways in the model

Submissions

1096. In our December 2014 UCLL draft determination paper we stated that the optimised network follows the road network. Models overseas often exclude use of motorways as gaining access is generally prohibitively difficult. However, in New Zealand network operators have access to motorways under the Act which defines a road as:[546]

[546] Telecommunications Act 2001, s 5.

road includes—

(a) a street and any other place to which the public have access, whether as of right or not; and

(b) land that is vested in a local authority for the purpose of a road as shown on a deposited survey plan; and

(c) all bridges, culverts, ferries, and fords that form part of any road, street, or any other place referred to in paragraph (a) or paragraph (b).

1097. The National Code of Practice for Utility Operators' Access to Transport Corridors (legislated under the Utilities Act 2010), provides a mechanism for an application for a utility operator to have access to carry out works on a motorway corridor by applying for a Corridor Access Request.[547] Information provided by the Telecommunication Companies shows that fibre network is regularly placed on private land and motorways.[548] While there is no automatic right of access for utility companies to work on roads, we consider that it is common practice in New Zealand for telecommunications cables (copper and fibre) to be installed in road, rail and motorway corridors.

1098. Accordingly, our model included use of motorways as a hypothetical efficient operator would be likely to make use of motorways where it is efficient to do so. There are, however, likely to be additional consent and traffic management costs incurred in laying fibre along motorways.

1099. Our model also made use of private roads on the basis that a hypothetical efficient operator would pay consent costs and obtain access to lay fibre on private land where efficient to do so. Consequently, a degree of weighting to minimise the use of private roads and motorways when calculating the shortest path from an individual property to an exchange building was included.

Analysis

1100. As stated above Chorus has submitted that the potential additional costs of accessing motorways and private roads have not been included.[549]

1101. We agree that we have not included an additional cost for accessing motorways.

1102. The reason for this is that the cost weighting in the model is not the same as the cost of providing the service.

1103. The network cost weighting is a mechanism for allowing the model to traverse along the correct network paths without the need to manually review each path. The weighting figures used only reflect the general desires of the network design which is

547 National Code of Practice for Utility Operators' Access to Transport Corridors, paragraph 4.1.1.

548 Notice to Supply Information to the Commerce Commission Sections 98(a) and (b) Commerce Act 1986, 17 April 2014, paragraph [6.5].

549 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [93.3].

to use the public road network where possible rather than the private road network unless it is necessary to connect to a building on the private network and avoid the motorway unless there is no alternative.

1104. As a result, the model only includes trenching along 34 metres of motorway.

1105. The way the cost weighting has been used for the private roads in the model provides for two key scenarios:

1105.1 The first is that from a network modelling perspective the private roads will not be used to connect public roads. This reflects what would happen in reality; that a hypothetical efficient operator would not put fibre through a private property when it is possible to place the fibre alongside a public road unless there was a financially sound reason for doing so.

1105.2 Secondly, where there is a building associated with a private road then the fibre network must travel along the private road as there is no alternative until such point as it reaches the public road network. The cost weighting in the model is irrelevant at this point as the path must be taken and effectively becomes the shortest path with the cost for each metre of private road being a constant and therefore cancelling out.

1106. The model also optimises the paths taken which effectively removes portions of the network that are not relevant – that is those sections of public and private road that do not need to have fibre in order to service buildings, are not fibred and therefore while part of the road network, do not contribute to the hypothetical efficient operator's cost.

1107. As the network cost weighting is not related to any potential additional costs of trenching along motorways or private roads, we have not included additional costs for this.

Attachment D: Network Deployment

1108. Having selected the MEA (see Attachment B), we need to consider another layer of detail regarding how our network will be rolled out; where (or to which end-users) will Fixed Wireless Access (FWA) be deployed, how will we decide how much of the access network will be on poles rather than buried, and how much of the network can share costs with other infrastructure (eg, electricity distribution networks).

1109. In this Attachment we discuss these decisions under the three broad headings FWA, aerial deployment, and infrastructure sharing.

FWA in the UCLL MEA

1110. We propose that FWA should be considered part of the UCLL MEA.[550] However, following consideration of submissions, we are now proposing a slightly modified approach to the way we utilise FWA.

1111. In particular, we will be using the current RBI FWA coverage areas to derive costs for service provision to end-users who currently receive only low-speed data or voice-only service. We will then apply these costs to voice-only and low-speed data end-users nationally (as described in more detail below).

1112. We note in this regard that we are proposing to model the deployment of FWA by deriving a cost in the cost model and applying it to selected end-users rather than physically modelling the position of the FWA sites. As we describe in more detail below, we consider that this best balances a number of competing concerns and difficulties which arise in the context of modelling FWA.

Background to our FWA choice

1113. We first proposed FWA technology as a candidate MEA, at the "edges" of the hypothetical network, in our 2013 process and issues paper.[551] Both Vodafone and Spark were in favour of the use of FWA as an MEA in low-density areas.[552,553] Chorus, however, did not believe that FWA was available as an MEA, since it cannot be unbundled at layer 1. Analysys Mason for Chorus submitted that, although Sweden had used FWA in their MEA, it had only been used in the ultra-rural geotype, where the existing service does not include broadband.[554]

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550 A full discussion of FWA in the MEA is presented in Attachment B.

551 Commerce Commission "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" 6 December 2013, paragraph [104.4].

552 Vodafone "Comments on process and issues paper for the unbundled copper local loop (UCLL) final pricing principle" 14 February 2014, paragraph [B3].

553 Telecom "Submission on Process and issues paper for determining a TSLRIC UCLL price" 14 February 2014, paragraph [93].

554 Analysys Mason "Report for Chorus - Response to Commission" 12 February 2014, section [1.4.2]. citing European Commission, Brussels, 12/05/2011 C(2011) 3431 SG-Greffe (2011) D/7587 Commission decision concerning Case SE/2011/1205: Further details of price control remedies – review of the LRIC model Comments pursuant to Article 7(3) of Directive 2002/21/EC.

1114. In our July 2014 consultation paper, we disagreed with Chorus' restrictive interpretation of the MEA for UCLL, and proposed to deploy FWA at Vodafone's RBI sites.[555] Chorus continued to disagree with the use of FWA, arguing that FWA: (i) could not be unbundled at layer 1; (ii) could not be used as the MEA for UBA; and (iii) connections would have a high failure rate.[556] Telecom and Vodafone, on the other hand, argued that our proposed deployment was too limited.[557] They suggested a binary approach whereby FWA should be deployed wherever it is more efficient (ie, has the lowest cost).

1115. Network Strategies for Telecom NZ and Vodafone NZ submitted that an efficient operator would utilise FWA in areas of low line density, but that this would still produce a footprint considerably wider than the RBI footprint.[558]

1116. In our December 2014 draft determination paper, we said that although we had given weight to such factors as "point-to-point" and "ability to unbundle at layer 1", we did not consider them determinative for our MEA selection. For instance, we had given less weight to the ability to unbundle in rural areas where unbundling is unlikely to be feasible.[559] We therefore disagreed with Chorus' "all or nothing" view that FWA should be excluded because it could not be unbundled at layer 1. Instead we proposed a more nuanced approach. Specifically, we considered that FWA met the "core functionality" of the UCLL service but we agreed that it would not be an appropriate nationwide MEA.[560] Accordingly, we maintained our view that FWA remained a suitable candidate MEA in the relevant circumstances.

1117. In the 2014 draft UCLL determination paper we proposed that:

1117.1 we would continue to use the RBI footprint as our FWA coverage area;

1117.2 our FWA service would be LTE at 700 MHz;

1117.3 we would cap the number of end-users at 67 per FWA site, allowing us to maintain an average throughput of 250 kbps per end-user, consistent with our treatment of UBA;

555 Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [164].

556 Chorus "Submission in response to the Commerce Commission's consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paragraphs [317–335].

557 Telecom "UCLL and UBA FPP: consultation on regulatory framework and modelling approach" 6 August 2014, para 127, and Vodafone New Zealand "Comments on consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, paragraphs [G2.1–G2.6 and following recommendations].

558 Network Strategies "Final report for Telecom New Zealand and Vodafone New Zealand - Key issues in modelling UBA and UCLL services - Commission consultation on regulatory framework and modelling approaches for FPP process" 6 August 2014, p. 4.

559 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraphs [530-531].

560 Ibid. Paragraph [531].

1117.4 we would choose the most expensive end-users within the RBI coverage area to serve with FWA, thus ensuring the most efficient allocation of FWA resources.

1118. Chorus continued to disagree with the use of FWA as an MEA at all, saying “FWA is not capable of delivering either the full functionality or core functionality of the regulated service: in particular, it is not capable of delivering an unbundled Layer 1 service to RSPs.[561] Chorus also said that our allowance for spectrum costs was too low.

1119. Spark and Vodafone submitted that our approach was far too conservative, and was not efficient.[562] They maintained their view that FWA should be deployed wherever it is cheaper.

1120. Network Strategies for Vodafone and Spark submitted comments on our approach to FWA.[563] Its submission made the following points regarding our FWA model:

1120.1 Our coverage was too restricted. FWA would be efficient over a wider area that the RBI coverage provided.

1120.2 We had been too conservative with our assumptions regarding the throughput available from an FWA site (and therefore the number of customers that could be served).

1120.3 Our assumptions regarding the coverage that could be achieved with LTE at 700 MHz were conservative, since we used Vodafone’s existing RBI coverage.

1120.4 Our approach of only serving the most expensive end-users in the RBI coverage area was unrealistic from a network planning perspective, and could lead to counterintuitive results.

1120.5 We had not considered the use of microwave backhaul in our model.

1120.6 We had overstated spectrum fees.

1120.7 Other points related to demand assumptions and errors in our model.

1121. As a further response to our FWA modelling, Network Strategies presented a report on its own FWA model in which is modelled the cost of FWA to serve the parts of zones 3 and 4 where the ESA has not yet been unbundled[564]. There were a number

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561 Chorus “Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, para [17].

562 Spark “Submission on UBA and UCLL FPP pricing review determination” CONFIDENTIAL, 20 February 2015, paras [9] and [40] in particular; and Vodafone “Submission on process paper and draft pricing review determinations for Chorus’ Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason’s TSLRIC models” 20 February 2015, para [1.8].

563 Network Strategies “Final report for Spark New Zealand and Vodafone New Zealand - Modelling Fixed Wireless Access” CONFIDENTIAL, 20 February 2015, section 2.

564 Ibid, sections 3 and 4

of key components and assumptions underpinning the Network Strategies model including the following:

1121.1 The cost was calculated by identifying suitably mixed areas, engineering the FWA service in detail for each specific area, thus calculating the cost per customer in each sample area.

1121.2 The modelling assumed site sharing with Vodafone's existing sites plus some additional sites.

1121.3 The model assumed sharing at some sites, where land rental was shared.

1121.4 The model also assumed that the hypothetical efficient operator would also provide mobile services from new and co-located sites. The hypothetical efficient operator's mobile business thus also shared the site costs.

1121.5 It used our modelling assumptions in a number of areas, including maintaining a minimum throughput of 250 kbps.

1121.6 Network Strategies recommended that the costs derived from the engineered sample areas should then be applied to end-users in zones 3 and 4 in ESAs that had not yet been unbundled.

1122. We have considered submissions received on both of our 2014 draft pricing review determinations. We have agreed with submissions that we should allow for growth in demand of UBA throughput per end-user, a change from our previous position of allowing for 250 kbps per user with no growth.[565]

1123. This means, in practical terms, allowing 1.9 Mbps per end-user for FWA if we are to continue our policy of making our FWA service consistent with UBA.

Our revised approach to FWA

1124. Following consideration of submissions we have sought to develop a workable solution to modelling FWA. In particular, we note that developing an approach to modelling how the hypothetical efficient operator would deploy FWA is a two-step process. First, how do we identify the areas where FWA should be deployed? Second, once that area has been defined, how do we choose which end-users in those areas should be served by FWA?

1125. Turning to the first step, we note that it very difficult to develop a workable and sensible solution short of modelling the entire country. Unfortunately, submissions did not provide us with a more workable solution that we considered was fit for purpose.

1126. Network Strategies' approach was to model the cost of providing FWA to the parts of Chorus' Zones 3 and 4 (the rural zones) yet to be unbundled. Network Strategies

565 Our "Draft pricing review determination for Chorus' unbundled bitstream access service draft determination", 2 July 2015, Attachment B para [782].

provided no justification for choosing Zones 3 and 4 in its submission beyond pointing out that this focus is "outside dense urban areas (that is, Chorus' Zone 1 and 2)".[566]

1127. We could also have sought to develop a more comprehensive "green fields" model. However, to do this, we would need to quantify the value that end-users place on the ability to unbundle at layer 1, as well as contend with the large number of material issues that would arise in a "green fields" context. Many of these issues arise from the need to identify the optimum position for the nodes, and the likely cost of providing access, power, and the like, since these costs depend on variables which are not being modelled.

1128. Indeed, TERA has advised us that such an approach would be complex to the point of being infeasible to apply, while the development of a value for unbundle-ability would be very subjective and difficult to measure. Taken together, we consider that this would compromise any gained accuracy.

1129. Accepting that it is simply infeasible in the circumstances to identify sensibly all geographic areas where the hypothetical efficient operator would deploy FWA, we have developed a revised approach to modelling FWA. In particular, we have used the current RBI coverage areas to derive the costs of deploying FWA, and have then applied those costs to certain categories of end-users across the whole network. Accordingly, FWA is implemented in a cost modelling sense only. Our approach does not seek to identify the actual geographic areas where a hypothetical efficient operator would deploy FWA. As we have described above, such an approach is riddled with difficulty which we consider would materially impair the quality of the results it would produce.

1130. We have used the current RBI coverage areas to derive the costs of deploying FWA, and have then applied those costs to certain categories of end-users across the whole network. Against that background, we have taken the following approach:

1130.1 We have identified three categories of end-users: voice-only (fed by more than 6 km of copper), low speed (capable of less than 1 Mbps, over 5300 m but less than 6 km of copper), and full speed (the rest);

1130.2 We have used RBI coverage areas to derive FWA costs for each of voice-only and low speed end-users, ensuring that only end-users inside the capital cost boundary were included; and

1130.3 We have applied these costs across the network to all customers in each category.

566 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Modelling Fixed Wireless Access" CONFIDENTIAL, 20 February 2015, para [3.2].

1131. In calculating the costs per end-users in RBI areas we have allocated:

1131.1 150 kbps of throughput to each voice-only end-user (assuming no growth, this is voice only);

1131.2 1 Mbps to low-speed customers (starting at 150 kbps and growing at the normal rate of 50% per annum for 5 years); and

1131.3 1.9 Mbps for full speed customers (starting at 259 kbps and growing at the normal rate of 50% per annum for 5 years);

1131.4 We have also increased the assumed throughput available per FWA site.

1132. We have assumed tower sharing (with two other networks), but we have not assumed that our hypothetical efficient operator has entered the mobile business. Such an assumption would be difficult to reconcile with the broader view of our hypothetical efficient operator; we are not assuming that it has entered the electricity distribution business or the retail telecommunications business. To be consistent, we must assume that it does not enter other businesses to take advantage of potentially lower costs in the access business.

Responses to Submissions

We have changed our approach to modelling FWA significantly. We therefore present our responses to submissions as follows:

- **FWA coverage too restricted**: RBI sites were chosen as a proxy. Our view remains that we value unbundling, so we disagree with the view that the choice of FWA should be made purely on cost. Our view is that FWA should be used for lines where costs are particularly high and unbundling is unlikely – our judgement is that, on balance, the number of customers fed by RBI felt about right.
- **Conservative throughput assumptions**: we agree and have increased our throughput assumptions.
- **Conservative coverage assumptions**: we agree that using the 700 MHz band would increase the coverage area compared to the 900 MHz band that Vodafone uses. We are also aware that topology and other factors can reduce coverage within existing coverage areas. We chose a conservative range to mitigate this factor.
- **Serving the most expensive users**: building a cost model is different to building a network. There are things that are done in the real world that can't be taken account of in the modelling world (eg, incremental build). This is something we can do in the modelling world that could not be done in the real world. The approach we have taken is consistent with our thought experiment.
- **Use of microwave backhaul**: the use of microwave backhaul is not forward-looking. Vodafone advised us that it is progressively replacing its microwave backhaul with optical fibre. For these reasons, we consider optical fibre to be the preferable choice of MEA.
- **Spectrum fees**: we agree these were too high, and have scaled the spectrum costs according to the number of end-users are served by FWA.

- **Demand assumptions**: we agree that end-users outside the TSO area should not have been served by FWA.

Aerial deployment

1133. Aerial deployment refers to the use of pole instead of burying of distribution cables and lead-in cables (known as underground deployment). Aerial deployment has a lower capital cost than underground, but has higher operational costs. Aerial is also more amenable to the sharing of infrastructure with other networks (notably electricity distribution networks) than underground construction.

Our draft decisions

1134. We have considered modelling aerially in areas where there is existing EDB aerial infrastructure. We have estimated this area to be approximately 49% of the UCLL network footprint based on data we have sourced from electricity distribution business (EDB) information disclosure.

1135. We have also considered the LFCs' experience in deploying their UFB networks using existing aerial infrastructure, which indicates that the hypothetical efficient operator would not be able to fully utilise existing aerial infrastructure. Accordingly we have made a downward adjustment of 2% to the percentage of aerial deployment for distribution cables and lead-in cables.

1136. Accordingly, for the access model, we have modelled:

1136.1 45% of lead-in cables using aerial infrastructure;

1136.2 47% of distribution cables using aerial infrastructure.

Percentage of aerial deployment

1137. In our December 2014 UCLL draft determination we stated that the hypothetical efficient operator would seek to deploy its network aerially in areas where there is existing aerial infrastructure.[567] While the hypothetical efficient operator may seek to deploy aerially in other areas we were uncertain of its ability to gain consent and the resulting cost of gaining that consent. Accordingly, we considered that a hypothetical efficient operator would deploy aerial infrastructure in areas with existing aerial infrastructure.

1138. To determine the level of aerial deployment in the model we then used Electricity Distribution Business (EDB) information disclosure data, alongside UFB aerial deployment information from Chorus and the LFCs:[568]

1138.1 For the lead-in cables we used EDB data to calculate a weighted average of end-users served by aerial.

567 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [609].

568 Ibid, paragraphs [614]-[618].

1138.2 For distribution cable, we considered Chorus' UFB aerial target of 20% as a floor for aerial deployment as its UFB rollout is limited to urban areas while the percentage of EDB aerial was our ceiling. We noted that we had also considered information provided by the other LFCs. Having considered this information, we decided to model 36% of the network using aerial deployment.[569]

1139. Chorus, highlighting advice from Incite, submitted that the hypothetical efficient operator would not have access to its own existing aerial network and would therefore find it extremely difficult to gain resource consent for a completely new service pole network.[570] Chorus concluded that we should revisit our assumptions to reflect the restrictive nature of Chorus' suite of consents.[571]

1140. We note that the Incite advice appears to be based on the incorrect premise that the hypothetical efficient operator's network is built in addition to the existing aerial networks. In this regard, we recognise the difficulty in comparing the current situation occurring in New Zealand with the hypothetical scenario we consider below, where the hypothetical efficient operator replaces Chorus' poles.

1141. As stated above, there does not seem to be a great deal of guidance on the likelihood of whether a hypothetical efficient operator would gain consent in the scenario of a new network being built overnight to replace the existing network.

1142. In our view, given the hypothetical network we are building, we consider it reasonable to assume that the hypothetical efficient operator would be granted consent given that the aerial deployment approach we propose below assumes no additional aerial network is built and therefore there is minimal change in visual effect.

1143. However, we recognise that the hypothetical efficient operator may incur consent costs in gaining this consent. There is considerable uncertainty as to what this amount should be given that the hypothetical build scenario differs from what Incite has considered where an operator builds on top of the existing networks. For instance, Network Strategies, citing a consultation paper document on National Environmental Standards for Telecommunications Facilities, noted that while ensuring compliance with consents would have led to additional costs in the past, this situation may no longer apply.[572]

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569 We note that TERA also modelled 36% of feeder cable aerially in the FTTN model. Our view is that a network operator would not deploy feeder cable aerially. Accordingly, we have modelled all feeder cable in the FTTN model underground.

570 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [488.1].

571 Ibid, at paragraph [489].

572 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 56.

1144. Chorus submitted that our aerial development parameters should ensure that the hypothetical efficient operator's aerial build is compliant with the rules it is required to follow.[573] To the extent possible, we have ensured that our aerial modelling meets the required guidelines in New Zealand.[574] However, a pragmatic approach is required in modelling aerial deployment. For example, we do not have specific information regarding the actual location of existing pole networks throughout New Zealand. Accordingly, we have used the EDB information available to us as a proxy for determining the replacement cost of aerial deployment by the hypothetical efficient operator.

1145. Regarding our approach to modelling aerial deployment, Chorus submitted that the joint build scenario we had modelled was unrealistic as the hypothetical efficient operator would face a pre-existing network owned by EDBs and risked overstating the feasibility of aerial deployment.[575] Chorus highlighted a number of constraints that it had experienced in deploying its UFB network that we would have to take into account, including:[576]

1145.1 whether a suitable pole is present and/or can be erected;

1145.2 whether the hypothetical efficient operator has an arrangement with the pole owner permitting it to access the pole;

1145.3 pole congestion; and

1145.4 costs of aerial deployment relative to underground.

1146. Chorus concluded that aerial deployment in all areas where there is existing aerial network is not possible in New Zealand, and such an assumption is not appropriate.[577] Chorus noted that the hypothetical efficient operator would face the same constraints as Chorus, and that Analysys Mason had modelled Chorus' 20% aerial UFB target in its model.

1147. Vodafone agreed with Chorus that the joint build scenario was unlikely. However, Vodafone submitted that given the hypothetical efficient operator is – by definition – efficient, the hypothetical efficient operator must be assumed to deploy aerially as much as is feasible. Vodafone recommended using the EDB data only to determine the percentage of aerial distribution.[578]

573 Ibid, paragraph [487.2].
574 For example, pole heights and road crossing heights.
575 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraphs [477]-[479].
576 Ibid, at paragraph [495].
577 Ibid, at paragraph [162].
578 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraphs [F2.3], [F2.4], and [F2.11].

1148. Spark submitted that it was unsure how we had determined the percentage of aerial distribution and that it appeared to be an average of EDBs and the Chorus target of 20%. Spark recommended that we use EDB data only to determine the percentage of aerial distribution absent compelling evidence on the contrary.[579]

1149. We agree with Vodafone and Spark that the hypothetical efficient operator will maximise aerial deployment to the largest extent feasible in areas with existing aerial infrastructure, where deploying aerially costs less than underground. Accordingly, to determine the percentage of aerial deployment we look to where it is feasible for the hypothetical efficient operator to deploy aerially.

1150. As noted above and in the December 2014 UCLL draft determination paper, while the hypothetical efficient operator may seek to deploy its network aerially in areas without existing aerial plant, we are uncertain of its ability to gain consent or the costs incurred in gaining consent.[580] We have not received any sufficient information and evidence as yet to justify a change to our position. As such we consider that the hypothetical efficient operator would deploy aerially to areas where there is existing aerial plant.

1151. Therefore, our view remains that the existing EDB aerial infrastructure provides a reasonable starting point for our proxy for the areas where the hypothetical efficient operator would seek to deploy its network aerially. The hypothetical efficient operator would therefore seek to deploy up to 49% of its distribution cables aerially.[581]

1152. Chorus submitted that the hypothetical efficient operator would not deploy aerially in all places where poles are available and aerial deployment is legally permitted.[582] Given our view that the hypothetical efficient operator would seek to maximise its use of existing aerial infrastructure, we have considered the LFCs experience in deploying their UFB networks using existing aerial infrastructure. While the LFCs experience is restricted to certain regions of New Zealand, we consider it reasonable to assume that the hypothetical efficient operator would achieve similar levels of aerial utilisation across New Zealand:

1152.1 Northpower has noted that its default design principle is aerial reticulation, and only if after due consideration this was not possible or feasible, an underground construction methodology is used. Northpower has since clarified that instances of undergrounding in aerial areas is very rare, of which there are only a few instances.

579 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraphs [289]-[293].

580 We are not aware of Chorus or the LFCs seeking to deploy new aerial networks in areas where there is no existing aerial infrastructure.

581 We note that the 49% is based on updated 2014 EDB information disclosure data, which can be found at http://www.comcom.govt.nz/dmsdocument/13272.

582 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [142].

1152.2 Ultrafast Fibre has noted that, generally, overhead construction is cheaper and should be the first option considered. However if drilling down one side of the street for feeder and/or many of the drops are underground, it may be more economical to use underground distribution. Further information provided by Ultrafast Fibre indicated that a small proportion of its network is deployed underground in areas where there is existing aerial infrastructure.

1153. The information provided by Northpower and Ultrafast Fibre suggests that full utilisation of existing aerial by the hypothetical efficient operator is not possible. We have also considered Chorus' submission that its 20% target is reasonable. Given that our hypothetical efficient operator is assumed to be building a network from scratch (without re-using existing underground infrastructure), we consider that Chorus' UFB target of 20% will underestimate the efficient level of aerial deployment undertaken. Based on deployment experience of Ultrafast Fibre and Northpower, our view is that a reduction to the EDB aerial percentage of 2% takes into account areas that the hypothetical efficient operator would be unable to utilise existing aerial infrastructure. Accordingly, we have modelled 47% of distribution cables using aerial infrastructure.

1154. For lead-in cables, we have applied the same approach as the December 2014 UCLL draft determination paper. Accordingly, we have approximated the number of premises served by aerial lead-in cables by assuming a uniform distribution of end-users across the network, and calculating a national weighted average percentage of end-users served by aerial lead-in cables. The table below outlines how we have calculated the percentage of end-users served by aerial lead-in cables.

1155. For consistency with our approach to aerial distribution cable, we have applied a downward adjustment to the estimated percentage of customers served by aerial lead-ins by 2%. Accordingly, we have modelled 45% of lead-in cables using aerial infrastructure.

1156. We consider our approach consistent with our TSLRIC objective of efficient cost recovery. As we set out above, a hypothetical efficient operator replacing Chorus' network today would seek to minimise the cost of deploying its network. Therefore, in our view, the hypothetical efficient operator seeking to maximise its aerial deployment is consistent with including only those costs efficiently incurred in providing the UCLL service.

Table 10: Estimated customers served by aerial infrastructure by EDB area[583]

	Customer base	Est % of EDB customer overhead	Average number of customers served by overhead
Alpine Energy	31,212	56%	17,496
Aurora Energy	82,656	58%	22,372
Buller Network	4,578	80%	3,583
Centralines	8,328	74%	6,217
Counties Power	37,507	61%	22,322
Eastland Network	25,556	68%	17,158
Electra	112,875	53%	59,691
Electricity Ashburton	17,727	27%	4,421
Electricity Invercargill	17,247	7%	1,145
Horizon Energy	24,722	46%	11,188
MainPower	36,717	29%	10,917
Marlborough Lines	24,445	62%	13,793
Nelson Electricity	9,067	18%	1,639
Network Tasman	37,291	48%	17,579
Network Waitaki	12,306	87%	9,790
Northpower	54,134	67%	35,821
Orion	189,962	44%	77,046
OtagoNet	14,798	95%	13,973
Powerco	321,957	56%	187,790
Scanpower	6,770	65%	4,347
The Lines Company	23,499	71%	17,842
The Power Company	34,574	80%	27,620
Top Energy	30,603	26%	7,953
Unison	109,316	40%	35,885
Vector	536,035	44%	230,132
Waipa Networks	23,830	67%	15,802
Wellington Electricity	164,789	41%	80,428
WEL Networks	84,707	48%	34,335
West Power	13,092	52%	6,743
Total	**2,077,208**	**47%**	**995,026**

583 Data sourced from http://www.comcom.govt.nz/dmsdocument/13272. Updated customer numbers were not available at the time of calculation.

Modelling aerial deployment

1157. The scenario that TERA modelled in the December 2014 UCLL draft determination was essentially a "joint build" between the hypothetical efficient operator and the EDB. TERA assumed that there was no existing aerial network and modelled a joint rollout between the hypothetical efficient operator and the EDB with costs allocated equally between the two.

1158. As noted above, both Chorus and Vodafone submitted that the scenario modelled was not realistic:

1158.1 Chorus submitted that the commercial reality in New Zealand is that lines companies have existing pole networks and would not engage in a new build. Instead, lines companies would charge commercial tariffs for pole access.[584]

1158.2 Likewise, Vodafone submitted that the hypothetical efficient operator would enter into commercial negotiations with existing infrastructure owners and that the sharing cost would reflect the marginal additional cost to an EDB of hosting the hypothetical efficient operators' equipment.[585]

1159. It was not our intention to reflect a joint build scenario. However, we recognise that the cost allocation methodology used implied a scenario where the hypothetical efficient operator and the EDB equally shared the cost of deploying a new aerial network. Accordingly, we have amended our cost allocation to reflect that the hypothetical efficient operator is building a network that replaces Chorus' copper network only. In areas where the hypothetical efficient operator deploys its network aerially, the hypothetical efficient operator would erect telecommunication poles on the "minor" side of the road for lead-in cables (replacing Chorus' poles) and lease pole space from the EDB on the "major" side of the road to deploy its distribution cables.

1160. To better reflect the build scenario described above, we have made the following changes to the aerial network model in order to more accurately reflect the cost to the hypothetical efficient operator of rolling out aerial infrastructure:

584 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [140].

585 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, paragraph [H2.2].

1160.1 Electricity poles capable of carrying both electricity and telecommunications distribution cables are deployed on the "major" side of the road, and telecommunications poles for lead-in cables deployed on the "minor" side of the road. The cost of the poles are then allocated as follows:

1160.1.1 100% of the cost of the telecommunications poles is allocated to the hypothetical efficient operator. Our view is that the hypothetical efficient operator would have a similar reciprocal agreement with the EDBs as Chorus. We consider this approach consistent with the existing practice in New Zealand where Chorus owns the poles on the "minor" side of the road and has a reciprocal sharing agreement with the EDBs for lead-in cables.[586]

1160.1.2 For the EDB's electricity poles, we have determined an allocation of costs that reflects the cost to the hypothetical efficient operator of leasing pole space to deploy its distribution cables. We note that Chorus provided pole lease costs showing it pays[ ]**CNZCI** for distribution and lead-in cables and [ ]**CNZCI** for lead-in cables only. Ultrafast Fibre pays [ ]**UFFCI** for access for approved telecommunications equipment. Accordingly, we modelled an annual rental cost of $25 per pole for the use of EDB poles for deployment of distribution cables only.

1160.2 In addition, Chorus has submitted that the hypothetical efficient operator would incur the cost of poles which require replacement. We agree – an EDB is unlikely to incur the cost itself if it does not need to replace the pole for its own use. Accordingly, we have included a mark-up to reflect the cost of replacing these poles. While we do not have information on how much of the existing aerial network would need to be replaced to carry additional overhead cables, Chorus has estimated that between [ ]**CNZCI** of poles that Chorus proposes to use for aerial deployment will require replacement. Having considered Chorus' information, in our view the hypothetical efficient operator would also incur the cost of replacing 10% of electricity poles as those poles are not currently capable of carrying distribution cables.

1161. Chorus has also submitted that the hypothetical efficient operator would incur costs relating to the consenting and planning of aerial deployment.[587] As we set out above, there is considerable uncertainty as to the amount of consenting costs the hypothetical efficient operator would occur. However, we have included an allowance of [ ]**CNZCI** for consenting, based on information provided by

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[586] Chorus "Submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paragraphs [390]-[392].

[587] Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [150.3].

Chorus.[588] However, this information is not complete for a national rollout and we seek submissions on an appropriate amount, supported with evidence that should be allocated for consenting costs that would be incurred by the hypothetical efficient operator.

1162. We have also received a large number of submissions addressing technical details such as the size and number of poles used in the model. We have discussed these technical submissions with TERA. Responses to these points are set out in TERA's review of submissions and have therefore not been included in this Attachment.[589] We have reviewed this document and we agree with TERA's proposed amendments to the model.

Infrastructure sharing

1163. This section sets out our further draft decisions on the level of underground infrastructure sharing with utility companies, and the level of sharing of FWA towers with mobile operators.

Our further draft decisions

1164. Include 5% of underground infrastructure sharing with utility companies.

1165. Include sharing of FWA towers with two mobile operators.

Underground infrastructure sharing

1166. In our December 2014 UCLL draft determination paper we did not consider the possibility of our hypothetical efficient operator sharing underground infrastructure with utility companies.

1167. Consequently, underground infrastructure was not shared with utility companies.

1168. In its submissions to our December 2014 UCLL draft determination paper, WIK stated that the hypothetical efficient operator would deploy its MEA network to the most efficient degree of cost efficiency, including sharing trenches with other network operators, with utilities' infrastructure and with the infrastructure public transport organisations or public authorities may operate.[590]

1169. WIK considered infrastructure sharing to be:[591]

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588 Chorus "Submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" CONFIDENTIAL 6 August 2014, paragraph [374.2].

589 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Analysis of the industry comments following the December 2014 draft determinations" June 2015.

590 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [117].

591 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [389].

1169.1 state of the art in other jurisdictions;

1169.2 a win-win situation for both cooperating operators and of more importance in competitive markets due to the higher pressure of saving cost due to the lack of guaranteed monopoly returns even for the ducts managed inefficiently; and

1169.3 an option a hypothetical efficient operator would try to exploit.

1170. WIK further stated that – based on the experience with its own cost models – the relevant range of trenching cost reductions due to proper sharing assumptions is in the range of 5% to 30% of trenching cost.[592]

1171. In its submissions to our December 2014 UCLL draft determination paper, Network Strategies argued for underground infrastructure sharing referencing Ireland as an example of a country where existing electricity infrastructure has been utilised on a nationwide basis to deploy FTTH.[593]

1172. In its submissions to our December 2014 UCLL draft determination, Spark stated that it is currently involved in an increasing number of trench-sharing projects with a number of other utilities, and expects this practice to continue to increase in prevalence.[594]

1173. In its submissions to our December 2014 UCLL draft determination paper, Vodafone quoted a 2012 Chorus' investor presentation,[595] saying:

> Wherever economically viable existing trenching will be used', '[w]herever economically viable the existing copper connection 'lead in' duct or pole infrastructure will be utilised' and '[w]e'll be reusing as much of the existing network as we can for the UFB deployment and identifying opportunities to work with councils and utilities to reduce deployment costs is something we're really focussed on. This can involve trench sharing or linking with footpath programs to avoid reinstatement costs.

1174. In its submissions to our December 2014 UCLL draft determination, Chorus acknowledged that some degree of asset sharing should be allowed for network deployed underground but considered that this should be limited to 5%.[596]

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592 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [390].

593 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Modelling Fixed Wireless Access" CONFIDENTIAL, 20 February 2015, pp. 47-50.

594 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [68].

595 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [F1. 2].

596 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [128].

1175. Following submissions and cross submissions we have considered underground infrastructure sharing with utility companies from the perspective of what the hypothetical efficient operator can be expected to do.

1176. In particular, we consider that re-opening trenches and/or adding cables to existing ducts is unlikely to be a practical or economically viable solution.

1177. It is therefore our view that underground infrastructure sharing in practice is only possible in cases where the different kinds of infrastructure are being rolled-out simultaneously.

1178. In a TSLIRC context where the hypothetical efficient operator is rolling out its network overnight and the utility infrastructure is already in place, significant underground infrastructure sharing with utility companies therefore seems unlikely.

1179. If underground infrastructure sharing were to happen, it would be utility companies taking advantage of the hypothetical efficient operator's roll-out. This would in particular be relevant for electricity companies wanting to underground overhead power lines.

1180. According to Vector, the decision to underground in specific areas depends on a number of criteria, including:[597]

1180.1 the condition of the lines and equipment in the area;

1180.2 their performance history (capacity and faults);

1180.3 the number of customers who will benefit; and

1180.4 the level of other utility works planned for each area.

1181. As such, in our context, underground infrastructure sharing is primarily based on decisions made by the utility company rather than the hypothetical efficient operator, reflecting, eg, the efficiency, needs, company policy, etc. of the utility company rather than the hypothetical efficient operator.

1182. We agree with WIK that the hypothetical efficient operator would deploy its MEA network to the most efficient degree of cost efficiency. However, unless the hypothetical efficient operator can find a utility company which – at the time the hypothetical efficient operator rolls out its network – is interested in sharing the infrastructure, the argument for including underground infrastructure sharing in the model on this basis becomes less compelling.

1183. That said, we agree that given the opportunity to share its infrastructure in order to reduce costs, an efficient operator would definitely do this if possible. We note in this regard that underground infrastructure sharing between electricity companies

[597] http://vector.co.nz/undergrounding.

and telecommunication companies is taking place in both New Zealand and overseas.

1184. Accordingly, there is merit in including a limited amount of underground infrastructure sharing in the model as this will reflect what currently happens in New Zealand and overseas and therefore will reflect what the hypothetical efficient operator could sensibly do.

1185. In order to determine what percentage of underground infrastructure sharing can be considered, we have looked at data from the LFCs.

1186. UltraFast Fibre shares between [ ]**UFFCI** of its underground network with other utilities depending on areas with the average for the total network being [ ]**UFFCI**.

1187. Enable lists the level of trench sharing as [ ]**ECI** and only pertaining to the existing network where some trenching was shared with [ ]**ECI**.

1188. Against that background, we do not agree with WIK's statement that proper sharing assumptions will reduce the trenching costs by as much as 30%.

1189. The combination of the percentages provided by LFCs, Chorus' submission and the lower end of WIK's range lead us to include 5% of underground infrastructure sharing with utility companies.

Sharing of FWA towers with mobile operators

1190. In our December 2014 UCLL draft determination paper we did not consider the possibility of the hypothetical efficient operator sharing FWA towers with mobile operators.

1191. Consequently, the costs of the FWA towers were not shared with mobile operators.

1192. In its submissions to our December 2014 UCLL draft determination paper, WIK stated that radio towers usually are capable of hosting several base stations and that the hypothetical efficient operator would therefore share as many sites as possible with mobile operators.[598]

1193. We agree with WIK that the hypothetical efficient operator would deploy its MEA network to the most efficient degree of cost efficiency and that given the opportunity to share its infrastructure in order to reduce costs, an efficient operator would definitely do this if possible.

1194. Compared to sharing underground infrastructure, sharing FWA towers is different, as it does not require simultaneous roll-out for the sharing to be efficient and therefore take place.

[598] WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [119].

1195. FWA towers can be accessed after they have been deployed and given that they are capable of carrying other companies' infrastructure, there is no reason why the hypothetical efficient operator would not share as much as possible in order to reduce costs.

1196. A significantly higher degree of sharing of FWA towers compared to underground infrastructure sharing is therefore likely and we have sought to reflect that in our model.

1197. We also note that we have not received any submissions quantifying the degree of sharing of FWA towers. We consider that there is no reason why the hypothetical efficient operator would not share as much as possible in order to reduce costs.

1198. The FWA towers modelled are based on Vodafone's RBI-sites which are capable of hosting several base stations. Indeed, according to the Rural Broadband Agreement between Vodafone and MBIE, Vodafone's FWA towers must be constructed to enable co-location of at least two other access seekers (other than Vodafone).[599]

1199. For all the above reasons, we consider that we should assume that the costs of the FWA towers in the model should be shared between the hypothetical efficient operator and two mobile operators, thus reducing the impact the costs of the FWA towers have on the results of the model.

1200. This will be the most cost efficient network deployment and therefore consistent with our regulatory framework in Chapter 1.

[599] Rural Broadband Agreement, 20 11, Schedule 1, p. 17.

Attachment E: Asset Valuation

Purpose

1201. In this Attachment we explain what we have previously said on asset valuation in the context of TSLRIC, the key issues raised during the consultation process, our framework for carrying out the UCLL pricing review determination, and our current view on the appropriate asset valuation methodology to be used in our TSLRIC model.

1202. As we noted in the December 2014 UCLL draft determination paper, the treatment of existing potentially re-usable civil engineering assets such as ducts is a key issue.[600]

Our further draft decision

1203. Our further draft decision is to continue to use optimised replacement cost (ORC) for all assets as our asset valuation methodology. The main reasons for this are:

    1203.1 ORC is consistent with our framework for carrying out the UCLL pricing review determination and the concept of the hypothetical efficient operator, ie, the hypothetical network is built from the ground up, and is not constrained by the legacy choices made regarding the existing network that provides the regulated services.

    1203.2 ORC is consistent with the relevant TSLRIC objectives/outcomes, in particular encouraging efficient build/buy decisions, allowing for efficient cost recovery and incentivising the regulated entity to minimise its costs.

    1203.3 Section 18 purpose statement considerations.

What we have previously said on asset valuation

1204. Some submitters made reference to our previous statements to criticise our asset valuation decision in the December 2014 UCLL draft determination paper and the reasons why we believed that ORC for all assets is the most appropriate asset valuation methodology for our TSLRIC modelling.[601] Therefore, we consider it appropriate to briefly set out our previous statements on these matters.

1205. In summary and as discussed below, we have consistently (i) noted that a range of asset valuation methodologies are open to us when implementing TSLRIC; and (ii) expressed a preference for ORC in the context of a TSLRIC-based FPP.

1206. Our initial views on the application of a TSLRIC methodology were set out in a discussion paper in 2002, which examined the major conceptual and practical issues relevant to implementing a TSLRIC pricing methodology and included a section on

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600 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [620].

601 Eg, Spark "Submission on UBA and UCLL FPP pricing review determination" 20 February 2015, paragraph [307].

asset valuation.[602] We noted that a range of asset valuation methodologies could potentially be used, including opportunity cost, historic cost, replacement cost, or optimal deprival value. Following consideration of these options, we proposed to use ORC as the asset valuation methodology in estimating the TSLRIC of providing interconnection services.[603] Submissions in response to the 2002 consultation generally agreed with the use of ORC.[604] In our TSLRIC principles paper issued in 2004, we confirmed our view that ORC is the appropriate asset valuation methodology where the final pricing principle is TSLRIC.[605] This was also the asset valuation approach that we proposed in our draft FPP determination on interconnection services issued in April 2005.[606]

1207. In our 2010 submission to the Ministry of Economic Development (MED) consultation on the implications of structural separation, we noted that asset valuation is an important issue when setting pricing principles, and that TSLRIC can use a combination of replacement costs and historic costs.[607] While we noted that historic costs could be used for sunk investments and replacement costs for assets which were subject to realistic replacement, this was not intended as an endorsement or to signal a change in our approach, and we did not in that submission express a preferred option for valuing assets in a TSLRIC exercise.

1208. In our July 2014 regulatory framework and modelling approach paper, we noted that while there are different ways of interpreting forward-looking in the context of TSLRIC, it will generally involve looking at ORC.[608, 609]

602 Commerce Commission “Application of a TSLRIC Pricing Methodology – Discussion Paper” 2 July 2002.

603 Ibid, section 6.2. We noted that in bottom-up TSLRIC models, ORC is typically used and considered most consistent with TSLRIC. We also noted that even if existing assets were to be included as part of the MEA, historic costs are unlikely to reflect the forward-looking costs of providing the service.

604 For example, TelstraClear submitted that “the asset valuation approach should be an optimised, forward-looking approach, consistent with TSLRIC principles. The optimal network architecture and technology choice should be determined”. TelstraClear also noted that where a tilted annuity approach is used, ORC is required in order to allow the access provider to fully recover the cost of its investment (TelstraClear “Submission on the Commerce Commission’s Discussion Paper ‘Application of a TSLRIC Pricing Methodology – 2 July 2002’ ” 16 August 2002, paragraphs [49], [50]).

605 Commerce Commission “Implementation of TSLRIC Pricing Methodology for Access Determinations under the Telecommunications Act 2001 PRINCIPLES PAPER” 20 February 2004, paragraph [142].

606 Commerce Commission “Draft Determination on the Application for Pricing Review for Designated Interconnection Services” 11 April 2005, paragraph [98]. We were not required to issue a final determination in this case, as the initial application for a pricing review was withdrawn following a commercial agreement between the parties.

607 Commerce Commission “Commerce Commission Response to MED Discussion Document ‘Regulatory Implications of Structural Separation’” October 2010, p. 27.

608 Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [129].

609 We acknowledged that there are differing views on the meaning of forward-looking costs, with both Telecom and Vodafone arguing that an ORC valuation should not be applied to assets which can be re-used by Chorus in supplying the UCLL service, and Chorus supporting the use of ORC. We also referred to a report submitted by Frontier Economics for Vodafone, Telecom, and CallPlus in February 2014, which claimed that long-lived re-usable assets should be valued in a way that recognises past recoupment of sunk costs, such as Depreciated ORC (DORC) (ibid, paragraphs [137], [142]).

1209. In our December 2014 UCLL draft determination paper, we considered a number of different asset valuation methodologies, including ORC, DORC, and the dual asset valuation approach recommended by the European Commission (EC). Our preference was to use ORC to value all the assets of the hypothetical efficient operator, including both reusable and non-reusable assets. We listed the main reasons for preferring ORC: [610]

1209.1 ORC is consistent with the interpretation of forward-looking costs in the context of TSLRIC.

1209.2 ORC is consistent with our previous approach to TSLRIC and therefore our TSLRIC objective of predictability.

1209.3 ORC is likely to best incentivise the efficient build or buy choice and so is consistent with our objective of promoting efficient investment.

1210. We also considered the Supreme Court decision on the TSO net cost, as well as the EC recommendation to value civil engineering assets using a historic cost approach. We concluded that neither the Supreme Court decision nor the EC recommendation altered our preference for an ORC approach in the current context of implementing a TSLRIC-based FPP.[611]

Key issues raised in submissions and cross submissions

1211. In submissions and cross submissions on the December 2014 UCLL draft determination paper, a range of views were expressed on the asset valuation methodology that should be used for the TSLRIC modelling. The main issue relates to the treatment of certain classes of assets which may be unlikely to be replicated, namely civil engineering assets including ducts, trenches, and manholes, and whether these should be valued on a replacement cost basis or in a way which takes account of the historical recovery of such costs.

1212. The key issues raised by interested parties include the following:

1212.1 The use of ORC leads to over-recovery of costs (Spark, Vodafone, Wigley and Company).

1212.2 The use of ORC is inconsistent with the *Vodafone TSO* case[612] (Spark and Wigley and Company).

1212.3 The use of ORC is inconsistent with Chorus and LFCs re-using their existing assets in their UFB deployments.

1212.4 ORC is the only option available under TSLRIC pricing (Chorus).

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[610] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [637].

[611] Ibid, paragraphs [660], [693].

[612] *Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138, [2012] 3 NZLR 153.

1212.5 More weight should be placed on the European Commission's recommendation to use a dual asset valuation methodology (Spark, Vodafone, Wigley and Company).

1213. For the reasons set out in the following sections, we continue to be of the view that ORC should be used to value all assets of the hypothetical efficient operator in the present context.

Our framework for carrying out the UCLL pricing review determination

1214. As explained in Chapter 1, in this pricing review determination we must apply the FPP, and the FPP for the UCLL service is TSLRIC.[613]

1215. TSLRIC is defined in the Act as 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".[614] The definition of TSLRIC also includes a reasonable allocation of forward-looking common costs.

1216. The Act's definition of TSLRIC does not, however, provide explicit guidance on the approach to be taken on the valuation of assets under a TSLRIC-based FPP. As explained in Chapter 1:

1216.1 Under our framework for carrying out the UCLL pricing review determination, a hypothetical efficient operator builds and operates an entirely new network from scratch, using modern efficient technology.

1216.2 The hypothetical network is not constrained by legacy choices made regarding the nature of assets or the mix of technology employed. This involves the assumption that all assets within the legacy network no longer exist, and modern and efficient technology is used to build and operate the hypothetical network.

1216.3 Such an approach is consistent with the economic theory behind the TSLRIC pricing principle, and also with the Court of Appeal's characterisation of TSLRIC[615].

1217. In making our draft asset valuation decision, we were also guided by the TSLRIC objectives/outcomes set out in Chapter 1.

Setting out the options available to us

1218. We continue to have the view that forward-looking TSLRIC models can apply a number of other approaches to asset valuation and it is open to us to choose such an approach.

613 Telecommunications Act 2001, Schedule 1, Part 2, Subpart 1.
614 Telecommunications Act 2001, Schedule 1, clause 1.
615 *Chorus v Commerce Commission* [2014] NZCA 440 at [30].

1219. The following options have been raised in submissions and cross submissions and are considered as part of this draft determination:

1219.1 ORC: supported by Chorus.[616]

1219.2 Historic cost/re-use: supported by Spark, Vodafone, WIK, and Wigley and Company. [617, 618, 619, 620] These submitters generally support the EC recommendation to use a "dual asset valuation" approach involving historic cost for re-usable and "non-replicable" assets, and ORC for "replicable" assets.

1219.3 DORC: previously supported by Spark and Frontier Economics. [621, 622]

1219.4 Optimal deprival value (ODV): referred to by Wigley and Company, and by Spark at the FPP conference. [623, 624]

1220. A number of parties submitted that we are constrained in terms of the asset valuation options that we are able to consider in the context of a TSLRIC-based FPP. For example:

1220.1 Chorus has argued that the only option available to us is ORC, as the forward-looking TSLRIC pricing principle by definition excludes historical considerations, and the use of historic costs would be a departure from orthodox forward-looking TSLRIC.[625]

1220.2 Wigley and Company has argued that our proposal in the December 2014 UCLL draft determination not to value existing assets such as trenches at "historical or other reduced cost … is not available as it does not apply and is

[616] Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 February 2015, paragraphs [89], [90].

[617] Spark "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [57].

[618] Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [F1.4].

[619] WIK "Submission in response to the Commerce Commission's "Draft pricing review determination for Chorus' unbundled bitstream access service" and "Draft pricing review determination for Chorus' unbundled copper local loop service"" 20 February 2015, section 1.1.2.

[620] Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [14.3].

[621] Telecom "Submission on Process and issues paper for determining a TSLRIC UCLL price" 14 February 2014, paragraphs [23], [24].

[622] Frontier Economics "Determining a TSLRIC price for Chorus' UCLL service" February 2014.

[623] Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraphs [13.2], [13.3].

[624] FPP Conference transcript, p. 107.

[625] Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" 20 February 2015, paragraphs [89], [90].

contrary to the judgment of the Supreme Court in *Vodafone v Telecom* [2011] NZSC 138".[626]

1221. We disagree. While we see some concerns with the use of some asset valuation options, we believe that a range of asset valuation methodologies is open to us.[627] As noted above, we have consistently expressed this view, together with a preference for ORC, in our previous statements on these matters.

1222. We have set out our assessment of the various asset valuation options in the following section, which includes our views on the approach taken by the *Vodafone TSO* case and the EC approach.

Assessing the options

Optimised Replacement Cost

1223. In this section we set out the reasons we propose to use ORC as our asset valuation methodology for all assets. In summary, ORC is consistent with:

1223.1 Our framework for the UCLL pricing review determination and the concept of the hypothetical efficient operator.

1223.2 The relevant TSLRIC objectives/outcomes.

1223.3 Section 18 purpose statement considerations.

1224. We also address the various criticisms that have been made of the ORC approach.

ORC is consistent with our framework for carrying out the UCLL pricing review determination and the concept of the hypothetical efficient operator

1225. Consistent with our TSLRIC concept of a hypothetical efficient operator building and operating an entirely new network from scratch, using modern efficient technology, we have not sought to model a hypothetical efficient incumbent which reuses Chorus's existing assets.

1226. Instead, as discussed in Chapter 1, we have assumed that the hypothetical efficient operator builds a new network from scratch, using modern efficient technology and which is not constrained by legacy decisions on network design or the types of assets employed. The use of ORC, which is based on the cost of deploying new and efficient assets today, is aligned with the economic framework underpinning our TSLRIC concept. These costs are then recovered, using a tilted annuity, over the full economic life of the assets.

ORC is consistent with the relevant TSLRIC objectives/outcomes

1227. The use of ORC is consistent with efficient investment by promoting entry decisions on whether to build network infrastructure or to purchase regulated access to

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626 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services", 20 February 2015, paragraphs [13.2], [13.3].

627 Eg, the use of historic cost may not be informative about forward-looking TSLRIC-based costs.

existing infrastructure. Encouraging such build or buy decisions is an important rationale which underpins the conceptual framework for TSLRIC pricing and which remains relevant in the New Zealand context where there has been competitive bypass of parts of Chorus's UCLL network by local fibre companies. In our view, by maintaining incentives for efficient infrastructure-based investment, the use of ORC is likely to facilitate competition such as that emerging between LFCs and Chorus, which is expected to provide long-term benefits for end-users both in terms of pricing and innovative new services.

1228. Other regulators have revisited this rationale for setting regulated access prices on the basis that competitive bypass of the local loop network is considered unlikely. For example, the ACCC has moved away from TSLRIC pricing for fixed access services and towards a "building blocks" approach.[628] The EC is recommending the use of historic costs for non-replicable assets and is also encouraging the deployment of next generation access (NGA) networks through mandating access to ducts.

1229. However, as explained in Chapter 1, we consider that there are some important differences between New Zealand and the European Union such that, on balance, there is not a sufficiently strong case to follow the EC and move away from the traditional approach to implementing TSLRIC.[629]

1230. Also, competitive bypass of Chorus's UCLL network has been occurring in New Zealand, and there is the prospect of further potential bypass through the government's planned expansion of the UFB deployment.

1231. We also consider that use of ORC is consistent with the TSLRIC objective of allowing for efficient cost recovery. In determining the ORC of the modern equivalent asset (MEA), costs are based on the most efficient technology used to supply the regulated service. Such capital costs are recovered using a tilted annuity, the parameters of which reflect the expected economic life of the asset, expected price trends, and the cost of capital.

1232. TSLRIC pricing, which is based on the costs of a hypothetical efficient operator building a new network rather than on the actual costs of the regulated entity, also provides an incentive for the regulated entity to minimise its costs. If regulated prices were determined on the basis of the actual costs incurred by the regulated entity (as under a historic cost approach), any cost reduction would flow more directly through into the asset base used to determine regulated prices. This will tend to reduce the incentives for the regulated entity to minimise costs in the first

[628] In its 2010 review of accessing pricing principles for fixed line services, the ACCC noted that the building blocks approach could be implemented using a range of asset valuation approaches, ranging from scarp value to ORC. The ACCC proposed an initial RAB value based on depreciated actual cost. See ACCC "Review of the 1997 telecommunications access pricing principles for fixed line services Draft Report" September 2010, section 5. As noted below, in implementing its "building blocks" approach in its July 2011 final access determination, the ACCC also took into account the importance of price stability.

[629] We also note that the ACCC recently reviewed and amended the pricing principle for fixed line access in Australia. In contrast to the EC varying the implementation of TSLRIC, the ACCC rejected TSLRIC and replaced it with a "building blocks" approach (ACCC "Review of the 1997 telecommunications access pricing principles for fixed line services Draft Report" September 2010).

place.[630] We expect these incentives to be stronger under a TSLRIC pricing principle which is based on ORC. While efforts to minimise costs may still have some influence on a TSLRIC-based access price, for example to the extent that the TSLRIC model might be guided by real-world considerations, such a link will tend to be less direct as the regulated price would be based on the ORC of the hypothetical efficient operator rather than on the actual costs of the regulated entity. The regulated entity may therefore have stronger incentives to minimise costs.

1233. A further TSLRIC objective which we discuss in Chapter 1 is to prevent monopoly pricing. We discuss below criticisms made by RSPs of the use of ORC, including that ORC may provide windfall gains to the access provider. We note that the conceptual approach of TSLRIC focusses on the forward-looking efficient costs of the MEA used to build a network from scratch, rather than the actual costs of the regulated entity. The regulated entity may experience both windfall gains and windfall losses as a result.

Section 18 purpose statement considerations

1234. As discussed above, we consider that the use of ORC is consistent with incentivising efficient investment decisions, in particular in relation to competitive bypass of the regulated entity. This has been the case in New Zealand with the LFCs, and with the planned expansion of the UFB deployment. To this extent, the use of ORC is likely to give best effect to the section 18 purpose to promote competition for the long-term benefit of end-users.[631]

Criticisms of ORC

1235. A number of interested parties criticised the proposed application of ORC to non-replicable" assets such as ducts. Parties referred to the Supreme Court's concerns over the use of replacement cost in the Vodafone TSO case, as well as to the Australian Competition Tribunal decision on Telstra. The main concern expressed by RSPs over the use of ORC is that it would result in over-recovery of costs. We turn to each of these criticisms below.

Vodafone TSO case

1236. The background to the *Vodafone TSO* case was described in Chapter 1. In summary, it concerned the calculation of the net cost to an efficient service provider of meeting the TSO obligations, by delivering a residential telephone connection to commercially non-viable customers (CNVCs).

1237. For the reasons explained below, we remain of the view that the Supreme Court's concerns about the use of a replacement costs methodology are not applicable here.

[630] Some incentive may remain to the extent that the regulated entity can achieve and retain cost reductions between resets.

[631] The subsidised nature of the UFB deployment suggests that the prospect of further entry beyond the UFB programme may be limited.

1238. The majority in the Supreme Court were critical of our decision to use a replacement cost valuation methodology for sunk legacy assets that were partially or wholly depreciated and would not in reality be replaced by Telecom in the future.[632]

1239. In the UCLL December draft determination we distinguished the *Vodafone TSO* case on the basis that the Supreme Court's decision:[633]

1239.1 was made in a different context;

1239.2 was backward-looking (while the TSLRIC exercise is forward-looking).

1240. Chorus agrees that the *Vodafone TSO* case is distinguishable and also points to the Court's comments about the low precedent value of the case.[634]

1241. Vodafone have indicated that the *Vodafone TSO* case does not have much to say in the context of our TSLRIC exercise, other than in relation to the question of asset stranding. [635, 636]

1242. On the other hand, other submitters (particularly Spark and Wigley and Company) argue that the case is indistinguishable and binding on us. In particular, they have submitted the following:

1242.1 The fact that the *Vodafone TSO* case was concerned with backward-looking compensation (ie, "the fact that the TSO process set prices for a specified period that was in the immediate past, rather than in the immediate future") rather than forward-looking makes no difference to the logic applied by the Court. [637, 638]

1242.2 The case was actually concerned with forward-looking costs.[639]

1242.3 The only significant difference with the present circumstances is that the case concerned TSLRIC+ (and not TSLRIC).[640]

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632 *Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138 at [70-72].

633 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [658].

634 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [285].

635 Transcript of the conference held between 15 April 2015 and 17 April 2015, p. 221.

636 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [D8.1(e)].

637 Spark "UBA and UCLL FPP pricing review draft decision" CONFIDENTIAL, 20 March 2015, paragraph [123].

638 Spark "Submission on UBA and UCLL FPP pricing review determination" 20 February 2015, paragraph [333].

639 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [13.12].

640 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [13.10].

1242.4 The majority of the Supreme Court drew support from its decision from a decision of the Australian Competition Tribunal (the *Telstra* case), which decided that the replacement cost approach was not appropriate for the relevant circumstances. [641]

1243. After reviewing submissions and cross submissions and while we acknowledge Wigley and Company's and Network Strategies' comments made at the conference that the TSO decision could be characterised as forward-looking, as explained in Chapter 1 we remain of the view that the decision in the *Vodafone TSO* case is distinguishable for purposes of this FPP process. [642, 643]

Our circumstances are different

1244. The issues in the *Vodafone TSO* case arose from the definition of "net cost".[644] As we have explained above, the purpose of the concept of "net cost" was to permit Telecom to recover the incremental cost that Telecom, acting as efficiently as possible in light of available technologies, would incur to satisfy the TSO obligations.

1245. As the majority of the court explained, the model which we constructed was required to be based on the premise that the efficient service provider (ESP) would be "a proxy for a firm which will continue to employ old assets".

1246. The majority's concern was that the adoption of a replacement cost methodology attributed a modern replacement cost to an asset that would not be replaced in reality and that this would "artificially inflate the value of the old asset and provide a windfall for [Telecom] in terms of an enhanced return on and of capital employed." The majority described this as a "free lunch".[645]

1247. In practice the context within which we are undertaking the current TSLRIC modelling exercise is different from that considered in the *Vodafone TSO* case. In that case, Telecom (as it was then) was not faced with the prospect of having significant parts of its copper network being overbuilt by fibre, and the majority was therefore concerned that the installed copper network, which was considered unlikely to be replaced, was being revalued. However, a significant proportion of

641 Spark "Submission on UBA and UCLL FPP pricing review determination" 20 February 2015, paragraph [333] and Russell McVeagh "Memorandum to Telecom on UCLL and UBA Final Pricing Reviews" 30 April 2014, paragraphs [9(b),12].

642 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [13.10].

643 Transcript of the conference held between 15 April 2015 and 17 April 2015, p. 224,226.

644 As noted above, "net cost" was defined under section 5 of the Act as "[t]he unavoidable net incremental costs to an efficient service provider of providing the service required by the TSO instrument to commercially non-viable customers". Under s 84(1) of the Act, the calculation of net cost must take into account two considerations (i) the range of direct and indirect revenues and associated benefits derived from providing telecommunications services to commercially non-viable customers, less the costs of providing those telecommunications services to those customers and (ii) the provision of a reasonable return on the incremental capital employed in providing the services to those customers.

645 *Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138, [2012] 3 NZLR 153 at [70-72].

Chorus' UCLL network is currently being replaced with fibre under the UFB, with end-users migrating from copper-based to fibre-based services.

1248. At a conceptual level, in determining a TSLRIC-based price under the FPP, we have not sought to model the efficient costs of Chorus or of an entity which is otherwise able to reuse Chorus's existing assets. That is, the operator we are modelling is not intended to be "a proxy for a firm which will continue to employ old assets".

1249. As explained earlier in this Chapter, consistent with our TSLRIC concept of a hypothetical efficient operator building and operating an entirely new network from scratch, using modern efficient technology, we are have not sought to model a hypothetical efficient incumbent which reuses Chorus's existing assets.

1250. While the efficient entity we have modelled is subject to real world constraints, it stands alone from Chorus, and does not seek to fully replicate Chorus characteristics. In limited cases we have referred to some characteristics of Chorus' network to inform our hypothetical efficient operator modelling. This does not mean that we are modelling an efficient incumbent. We have done this where it is simply impractical to model a pure hypothetical efficient operator network and where doing so would arguably give rise to a greater risk of regulatory error.

1251. Accordingly, the issue of Chorus receiving a "free lunch" does not arise. In the *Vodafone TSO* case, the concern was whether Telecom was overcompensated for investments actually made.[646] Here, our task is to set an efficient price which we consider is best set relative to the costs of a new entrant.[647]

1252. In light of the above considerations, we have revisited the adoption of our hypothetical efficient operator concept and considered whether it would be appropriate to replace it with a model of an operator that is an efficient version of Chorus.

1253. We remain of the view that our hypothetical efficient operator concept is the most appropriate approach to implementing TSLRIC. In particular, we consider that this approach is the best fit with the statutory requirement to model "forward-looking" and "long-run" costs, and consistent with the traditional economic framework for implementing TSLRIC.

1254. We also note that an "efficient Chorus" approach might be difficult to apply and could lead to irrational results. For example, there does not appear to be any reason to limit that approach to trenches and ducts. If the "efficient Chorus" had the existing copper network at its disposal it is not clear why it would construct a MEA. This would tend towards a cost model based on the use of the existing network. We are satisfied that such a model would not be consistent with Parliament's intention in adopting a TSLRIC model.

646 *Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138 at [41].

647 In the *Vodafone TSO* case Elias CJ noted the difference between the TSO context (where we were required to calculate the incremental cost of serving uneconomic customers) and price regulation (which is the current context) in the selection of a valuation methodology (at [15]).

1255. While we have previously noted similarities between the TSO net cost assessment and TSLRIC modelling, we consider that it is appropriate to use a replacement cost valuation methodology in this pricing review determination for the reasons stated above. [648]

Vodafone TSO case has limited value as a precedent for economic regulation generally

1256. We have just explained why we consider that the *Vodafone TSO* case is distinguishable in relation to the choice of valuation methodology.

1257. We also note that both Blanchard J and Elias CJ noted that the decision would have limited precedential value because of the "unique nature of the Part 3 regime" and subsequent legislative changes.[649] As explained above, the TSO was entered into under the "old Part 3 regime" and was concerned with supply to CNVCs by Telecom.[650] Finally, as noted by the High Court in the Input Methodologies judgment, the *Vodafone TSO* case dealt with the meaning of the specific statutory definition of "net cost" rather than the use of a more broadly expressed decision-making power.[651]

1258. Therefore, we consider it is reasonable to assume that the Supreme Court was concerned not to develop principles which might apply post the 2011 amendments given the materially different concepts those amendments introduced. As demonstrated above, the difference between a net cost calculation and FPP TSLRIC exercise supports the Court's view in this regard.

1259. We are also of the view that the market context in which we are determining a TSLRIC-based price for the UCLL service is materially different from that considered in the *Vodafone TSO* case. The Supreme Court's concern over the revaluation of Telecom's copper network related to a period in which that copper network was not being overbuilt. In contrast, Chorus' copper network is currently and to a significant extent being overbuilt through the UFB.

The Telstra case also involved different circumstances

1260. The decision of Blanchard J in the *Vodafone TSO* case drew support from the decision of the Australian Competition Tribunal in the *Telstra* case.[652] That case considered the interpretation and application of TSLRIC when setting a forward-looking price for the unconditioned local loop service (ULLS), the equivalent of our UCLL service.

648 Commerce Commission "Application of a TSLRIC Pricing Methodology – Discussion Paper" 2 July 2002, paragraph [33]; Commerce Commission "Implementation of TSLRIC Pricing Methodology for Access Determinations under the Telecommunications Act 2001 – Principles Paper" 20 February 2004, [38-42]; Commerce Commission "Draft Determination on the Application for Pricing Review for Designated Interconnection Services" 11 April 2005, paragraphs [65-67].

649 *Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138 at [7, 64.].

650 A terminology use in the *Vodafone TSO* case (*Vodafone New Zealand Limited v Telecom New Zealand Limited* [2011] NZSC 138 at [62], footnote [49]).

651 *Wellington International Airport Ltd v Commerce Commission* [2013] NZHC 3289 at [999].

652 *Application by Telstra Corporation Ltd* [2010] ACompT 1.

1261. In the *Telstra* case, the Tribunal characterised the objective of the modelling exercise as being to estimate the “ongoing costs that Telstra would incur in providing ULLS as efficiently as possible”.[653] In the context of that objective, the Tribunal considered that:

1261.1 A TSLRIC model was not a good way of measuring Telstra’s ongoing costs because those ongoing costs had no relationship to the costs that would be incurred by a hypothetical new entrant, in circumstances where Telstra could not face even hypothetical competition and there was no prospect of competition *for* the market (that is, replication of Telstra’s existing network).[654]

1261.2 Allowing Telstra a return on the replacement costs of a new network was inappropriate because it did not reflect the fact that Telstra already had trenches, ducts, etc, already in place. It would not reflect Telstra’s “legitimate business interests”, one of the criteria prescribed by the relevant legislation, because Telstra was only entitled to a reasonable return on its prudent past investment. Consequently, the costs of a hypothetical new entrant, as estimated by the Telstra model, did not provide the basis for a price that would promote the long-term interests of end-users.[655]

1262. In the New Zealand context, the use of TSLRIC is required by the Act. Furthermore, we do not see it as being used as a way of measuring the incumbent’s ongoing costs. Rather, we consider that it is appropriate in applying TSLRIC to look at the costs of a hypothetical efficient operator building and operating a new network. Accordingly, we do not consider that the concerns about using a replacement costs valuation methodology are relevant to the hypothetical efficient operator construct. In our circumstances, where we are required to implement an FPP based on TSLRIC, we consider that a hypothetical efficient operator building a MEA which is valued using ORC will produce an outcome which will best promote competition for the long-term benefit of end-users of telecommunications services in New Zealand.

1263. A particular difference between the New Zealand and Australian context is that build/buy incentives remain relevant in New Zealand. In particular:

1263.1 The *Telstra* decision was made in the context of the recently-contracted National Broadband Network project which involved the national deployment of fibre and the copper network ultimately being “cut off”.

1263.2 By contrast, all parties in the present process appear to accept that the copper network will remain relevant in significant areas of the country for some time. Thus, in New Zealand build versus buy incentives remain relevant.

653 Ibid at [230].
654 Ibid at [231-239].
655 Ibid at [240-246].

1263.3 There has been competitive bypass of parts of Chorus' UCLL network by LFCs (using underground and aerial infrastructure), and further bypass may emerge as a result of the Government's planned expansion of UFB. We therefore take a different view to the Tribunal on the relevance of build/buy signals.

1264. We therefore consider our approach is correct given the different context of the *Telstra* decision and the different circumstances in New Zealand.

1265. Finally, as explained earlier in this Chapter, we believe that our individual decisions (as applicable) and our overall decision best gives, or is likely to best give, effect to the section 18 purpose statement of promoting competition in telecommunications markets for the long-term benefit of end-users.

Other criticisms of ORC

1266. Spark also claims that we have not established a sound basis for concluding that ORC is the most efficient methodology. In its view, both DORC and dual asset valuation are consistent with forward-looking costs and should therefore be considered as appropriate options for asset valuation.[656]

1267. We discuss below the DORC and dual asset valuation methodologies. As noted below:

1267.1 The use of a DORC valuation is expected to produce the same annualised capital costs as ORC, when a tilted annuity approach is applied with parameters which are estimated in an unbiased manner. Spark agreed with this at the FPP conference, although it qualified its agreement since the FPP conference. [657,658]

1267.2 The use of a dual asset valuation approach as proposed by the EC involves the use of historic cost for non-replicable assets such as ducts, and replacement cost for other assets. However, we note that according to Spark's economic advisor, WIK, the use of historic costs is unlikely to be informative about forward-looking costs.[659]

1268. Vodafone was also critical of the use of ORC, claiming that it would result in Chorus being compensated twice for fully depreciated assets which remain in use. Vodafone noted WIK's estimate that the use of ORC results in a threefold inflation of Chorus' book value of the relevant assets.[660] Vodafone supported WIK's recommendation that, given the difficulty of using a dual valuation methodology, a 20% deduction to investment value should be adopted.

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656 Spark "Submission on UBA and UCLL FPP pricing review determination" 20 February 2015, paragraph [316].

657 FPP Conference Transcript, p.108.

658 Spark "Response to UBA and UCLL FPP conference questions" 28 May 2015.

659 WIK, "Wholesale pricing, NGA take-up and competition" 7 April 2011, p. 23.

660 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [F1.2(b)].

1269. As we noted in the December 2014 UCLL draft determination paper, and as discussed further below, a significant concern that we have with alternative asset valuation methodologies such as historic cost is their treatment of fully depreciated assets which remain in use.

1270. In terms of the EC approach, as explained above, we consider that there are some important differences between New Zealand and the European Union such that, on balance, there is not a sufficiently strong case to follow the EC and move away from the traditional approach to implementing TSLRIC.[661]

1271. Having said this, it is our understanding that under the EC approach (as explained in Chapter 1), such assets would be removed from the asset base which is used to determine regulated prices. This would mean that although the asset continues to have an economic value, its cost would be set at zero by the regulator, and access would effectively be provided for free. As Spark noted at the FPP conference, the forward-looking value of an asset should reflect the value to the owner of retaining the asset, which in the case of an asset which remains in demand, would not be zero.[662]

1272. In such cases, where an asset which has been fully depreciated in an accounting sense but remains in use, the issue would appear to be more to do with the life of the asset. We consider that our further draft decision on asset lives, including 50 years in the case of ducts, is appropriate. We note that no interested party has submitted any evidence to suggest that an asset life of 50 years for ducts is inappropriate. We discuss asset lives in more detail in Attachment H.

1273. Also, there are also a number of practical issues with the EC's recommended approach. For example, a decision would be required as to what types of assets are re-usable and non-replicable (and to which historic costs would be applied). The EC refers to ducts. However, in New Zealand, the UFB deployments by local fibre companies (LFCs) have involved LFCs bypassing existing Chorus ducts (through either using existing LFC ducts, installing new LFC ducts, and/or the use of aerial deployment), replicating at least some parts of Chorus's existing duct network. In addition, the EC recommendation refers to the indexing of historic costs, although it is not clear how this would be implemented.

1274. Several RSPs have pointed to WIK's estimate that ORC will result in a threefold inflation of Chorus' book value of the relevant assets[663]. We note that such a comparison fails to take into account a number of important factors.

661 We also note that the ACCC recently reviewed and amended the pricing principle for fixed line access in Australia. In contrast to the EC varying the implementation of TSLRIC, the ACCC rejected TSLRIC and replaced it with a building blocks approach (ACCC, "Review of the 1997 telecommunications access pricing principles for fixed line services Draft Report" September 2010).

662 FPP Conference transcript, p. 107.

663 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [F1.2(b)].

1274.1 First, an ORC valuation of any given asset will be recovered over the full economic life of the asset, whereas the depreciated book value of an asset will be recovered over a shorter period reflecting the expected remaining life of the asset.

1274.2 Second, the list of Chorus assets to which WIK refers includes not only the “non-replicable” categories referred to by the EC (such as access ducts), but also a wide range of other asset types, including electronic equipment, copper and fibre cables, and IT-related categories.[664] Of the asset categories which WIK claim as being either fully or significantly depreciated, none of these asset types are of the “civil engineering” category referred to by the EC. We are unaware of any RSP claiming that electronic equipment and cables should be valued at historic cost.

1275. We further note that TSLRIC is focussed on the forward-looking costs of building a new network, rather than the under- or over-recovery of historically incurred costs of the regulated firm.

1276. In this regard, determining a regulated price under a forward-looking TSLRIC pricing principle differs from a “building blocks” approach where the regulatory asset base is locked in with reference to the firm’s actual costs, as is the case under the regulatory framework in Part 4 of the Commerce Act 1986, and the “building blocks” approach adopted by the ACCC following its 2010 review of the pricing principles applicable to fixed access services in Australia.[665]

1277. While one of the objectives of TSLRIC pricing is to limit the regulated entity’s ability to set prices at the monopoly level, the approach is to set an efficient price without directly attempting to model a reasonable return for the incumbent based on its actual costs.

1278. In the December 2014 UCLL draft determination paper, we recognised that Chorus may have accumulated gains from supplying the UCLL service over time, although we did not consider this to be relevant for a forward-looking TSLRIC modelling exercise.[666] As noted above, we remain of this view.[667] We also note that the TSLRIC pricing principle is typically focussed on the forward-looking efficient costs of building a network, rather than the actual costs of the regulated entity. As a result of

664 WIK “Submission in response to the Commerce Commission’s “Draft pricing review determination for Chorus’ unbundled bitstream access service” and “Draft pricing review determination for Chorus’ unbundled copper local loop service”” 20 February 2015, paragraph [45].

665 The initial RAB value established by the ACCC was not based purely on historic cost. The ACCC considered a range of values, from depreciated actual cost to DORC, and made a number of adjustments in order to promote pricing stability. ACCC, “Inquiry to make final access determinations for the declared fixed line services”, July 2011, p. 37-38.

666 Commerce Commission, "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [643].

667 In this regard, we further note that in its Final Access Determination, the ACCC has stated its view that “on balance, Telstra is unlikely to have significantly under- or over-recovered depreciation on its network assets under the previous TSLRIC+ approach”. ACCC “Inquiry to make final access determinations for the declared fixed line services” July 2011, p. 45.

this break from actual costs, TSLRIC pricing may also generate potential windfall losses for the regulated entity, for example through the use of optimisation, network deployment (including assumptions around the level of aerial deployment) and selecting the least-cost MEA in the TSLRIC cost model.

Optimal Deprival Value

1279. As noted earlier, we have previously considered the use of optimised deprival value in the context of a TSLRIC-based FPP, which would be based on the cost to the asset owner if deprived of the asset.[668] In practice, ODV equals the depreciated replacement cost, except where the asset would not be replaced. If the rational choice is not to replace the asset, then the ODV of the asset is equal to the economic value of the asset, where the economic value is the present value of expected net income.

1280. We have previously concluded that the use of ODV can potentially create a circularity problem, as the deprival value of an asset that is not replaced will depend on the regulated price (which in turn is dependent on the asset value).[669]

1281. None of the submissions received on the December 2014 UCLL draft determination proposed that ODV be used as the asset valuation methodology.[670]

1282. We do not propose to use ODV in the pricing review determination.

DORC as an alternative to Optimised Replacement Cost

1283. A number of RSPs have supported the use of DORC as an appropriate option for asset valuation, as it takes into account the elapsed life of the asset. For example, Spark's submission on the December 2014 UCLL draft determination paper stated that DORC is consistent with efficient forward-looking costs.[671] In February 2014, in a report commissioned by Vodafone, Telecom (now Spark), and CallPlus, Frontier Economics supported the use of DORC for assets such as ducts, and outlined an approach to obtain a DORC valuation, based on the asset's ORC valuation adjusted for the expected remaining life of the asset.[672, 673] Telecom (now Spark), CallPlus, InternetNZ, Consumer NZ, and TUANZ all supported Frontier's proposed approach.[674]

1284. In its cross submission on the December 2014 UCLL draft determination, CEG argued that Network Strategies and WIK were incorrect to say that Chorus would receive a

668 Commerce Commission "Application of a TSLRIC Pricing Methodology – Discussion Paper" 2 July 2002, paragraph [189].
669 Ibid, paragraph [198].
670 ODV was however discussed at the FPP conference. See FPP Conference Transcript, p. [99, 107].
671 WIK "Submission in response to the Commerce Commission's "Draft pricing review determination for Chorus' unbundled bitstream access service" and "Draft pricing review determination for Chorus' unbundled copper local loop service"" 20 February 2015, paragraph [316].
672 Frontier Economics "Determining a TSLRIC price for Chorus' UCLL service: A Report Prepared for Vodafone New Zealand, Telecom New Zealand and CallPlus" February 2014, p. 36.
673 See Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [676].
674 Ibid, paragraph [677].

windfall as a result of using replacement costs instead of depreciated replacement costs. [675] CEG argued that using DORC should give the same result as ORC when economic depreciation is used to determine annualised capital costs (such as is done through a tilted annuity). CEG noted that as an asset approaches the end of its useful life, its value falls, although this value must be recovered over a shorter period (ie, the remaining life of the asset, rather than the full life).

1285. At the FPP conference, CEG criticised the approach proposed by Frontier in its February 2014 submission to determine a DORC valuation, arguing instead that DORC should be forward-looking, and should reflect the costs saved by not having to replace the asset today. CEG noted that the revenues based on such a DORC valuation over the remaining life would be the same as using an ORC valuation over the full life of the asset.[676]

1286. Spark agreed with CEG, provided the tilts and asset life are correctly estimated.[677]

1287. However, in a written response to questions raised at the FPP conference, Spark qualified its agreement at the FPP conference:[678]

> On the CEG premise, under specific circumstances – i.e. comparing an asset whose economic depreciation is modelled using a tilted annuity and where all the other parameters of the tilted annuity method (including a stable estimate of WACC and a linear price trend assumption) are identical – the depreciation charge will evolve in the same way in all periods during the life of the asset. Provided the specific circumstances remain constant, the use of a tilted annuity methodology has the effect that the HEO will have a modelled yearly depreciation cost comparable to that of an operator who invested earlier. As CEG note, this is simply maths. Unfortunately, this is only part of the equation as it does not take in to account the return “on” the capital employed.

1288. Spark went on to note that it did not support the blanket application of a replacement cost methodology, as such an approach overstates the efficient costs of providing the service when applied to assets that are not expected to be replaced in the future.

1289. Spark submitted that if such an approach were to be used, DORC was preferable over ORC. In Spark’s view, the use of DORC more accurately captures the efficient return on capital (as the ORC-based return on capital will exceed the actual return required by the regulated firm); DORC is less susceptible to differences between expected and actual parameters (such as the asset lives and the tilts); and DORC reflects the remaining earning potential of the asset.[679]

1290. Having reviewed submissions and cross submissions on the December 2014 UCLL draft determination, we consider that DORC and ORC should produce the same

[675] CEG cross submission “Issues from submissions UCLL and UBA” March 2015, paragraphs [19] to [22].
[676] See FPP Conference Transcript, p. 103.
[677] Ibid, p. 108.
[678] Spark, “Response to UBA and UCLL FPP conference questions” 28 May 2015, paragraph [7].
[679] Ibid, paragraphs [10-15].

results, as long as the parameters in the tilted annuity are correctly estimated in an unbiased manner.

1291. We also note that DORC will not produce the sort of outcome that proponents of asset reuse have in mind, namely to use depreciated historic cost over the remaining life of the asset.[680] We discuss this approach later in this Attachment.

1292. In

1293. Table 11 below, we illustrate how the use of a depreciated replacement cost valuation approach, which takes into account the elapsed economic life of assets, can generate the same annualised capital costs as an ORC valuation approach. The examples below also show how the resetting of prices using ORC should ensure a consistent annualised capital cost, given the assumptions made around the tilt and asset life parameters that are used in the tilted annuity formula.

1294. Under Scenario 1 in Table 11, a new asset is installed with an initial asset value (AV) of $100, expected economic life of 10 years, WACC of 10%, and with an expected price trend (tilt) of 2% per annum. For example, in the first year of operation, the tilted annuity calculates an annual capital charge of $15.09, which is comprised of a return on capital (WACC) of $10 and a return of capital (depreciation) of $5.09. The annual capital charge gradually increases over time (reflecting the 2% price trend). The present value of the stream of annual capital charges is equal to the original investment value of the asset ($100).

1295. Scenario 2 shows the effect of implementing a DORC approach halfway through the life of the asset (year 6). Under this approach, the depreciated replacement cost of the asset would be based on the revenues expected over the remaining life of the asset. In the example, the depreciated replacement cost would be $65.50 (which is equivalent to the present value of the annual capital charges over years six to 10 in Scenario 1), and the tilted annuity would be applied to this value to determine the annual capital costs over the expected remaining five years of the asset's life. As is highlighted in the table, these costs are identical to those determined over the same period under the ORC approach, as claimed by CEG and as agreed by Spark.

1296. Scenario 3 assumes that after five years, a new determination is made in which ORC is applied (ie, the asset is valued on the basis of a new replacement). The value of the new asset is based on the original asset value in the first determination ($100), indexed by the price trend (2% p.a.). This gives a new replacement cost of $110.41 at the start of the second determination. Using the same tilted annuity inputs (asset life 10 years, WACC 10%, and tilt 2%), the resulting annualised capital charges are again identical to those for the same years in the original ORC determination (Scenario 1) and where DORC was used to value the asset (Scenario 2).

[680] Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [93].

Table 11: ORC and DORC valuations

Scenario 1: ORC implemented at 1st determination (year 1)

Initial AV	100
WACC	10%
Asset life (years)	10
Tilt	2%

Year	AV	Annual Capital Charge	WACC	Deprn
1	100.00	15.09	10.00	5.09
2	94.91	15.40	9.49	5.90
3	89.00	15.70	8.90	6.80
4	82.20	16.02	8.22	7.80
5	74.40	16.34	7.44	8.90
6	65.50	16.66	6.55	10.11
7	55.39	17.00	5.54	11.46
8	43.93	17.34	4.39	12.94
9	30.98	17.68	3.10	14.59
10	16.40	18.04	1.64	16.40

NPV check 0.00

Scenario 2: DORC implemented at 2nd determination (year 6)

Initial AV (=PV of remaining charges)	65.50
WACC	10%
Asset life (years)	5
Tilt	2%

Year	AV	Annual Capital Charge	WACC	Deprn
1	65.50	16.66	6.55	10.11
2	55.39	17.00	5.54	11.46
3	43.93	17.34	4.39	12.94
4	30.98	17.68	3.10	14.59
5	16.40	18.04	1.64	16.40

NPV check 0.00

Scenario 3: ORC implemented at 2nd determination (year 6)

Initial AV (=initial AV in 1st determination, indexed by Tilt)	110.41
WACC	10%
Asset life (years)	10
Tilt	2%

Year	AV	Annual Capital Charge	WACC	Deprn
1	110.41	16.66	11.04	5.62
2	104.78	17.00	10.48	6.52
3	98.26	17.34	9.83	7.51
4	90.75	17.68	9.08	8.61
5	82.14	18.04	8.21	9.82
6	72.32	18.40	7.23	11.17
7	61.15	18.77	6.12	12.65
8	48.50	19.14	4.85	14.29
9	34.21	19.53	3.42	16.10
10	18.11	19.92	1.81	18.11

NPV check 0.00

1297. The scenarios shown in Table 11 confirm the view expressed by CEG and Spark that as long as the tilted annuity parameters are correctly estimated, the ORC and DORC approaches to asset valuation should produce the same annualised capital costs when applying a tilted annuity. Although Spark has claimed since the FPP conference that the return on capital employed has not been taken into account,[681] the annualised capital charges shown in Table 11 above do include both a return of capital (depreciation) and a return on capital (WACC).

1298. The analysis above also indicates that the use of ORC at future resets should not lead to revaluation gains or losses, as long as the tilts are correctly estimated.

1299. We are not persuaded by the reservations put forward by Spark since the FPP conference to prefer DORC over ORC.[682] In particular, an ORC valuation will be recovered over the expected full economic life of the asset, while a DORC valuation would be recovered over a shorter period reflecting the expected remaining economic life of the asset.[683] In addition, Spark has not demonstrated that DORC will be less susceptible to the value of the tilted annuity parameters.

681 Spark "Response to UBA and UCLL FPP conference questions" 28 May 2015, paragraph [7].
682 Ibid, paragraphs [10-15].
683 As shown above, allowing for the different asset lives under an ORC valuation (Scenario 1 below) and a DORC valuation (Scenario 2) should produce the same annualised capital charges.

1300. Our current view is that the use of a DORC valuation methodology should result in the same outcomes as ORC, as long as the parameters used in the tilted annuity are correct.[684]

Historic cost

1301. A number of RSPs supported the use of historic cost valuation for certain classes of re-usable and non-replicable assets such as ducts. For example, according to Vodafone, the proposal not to allow reuse of existing assets of telecommunications operators and other utilities is inconsistent with what a hypothetical efficient operator would do and Chorus' actual UFB deployment. Vodafone also claimed that our proposed approach in the UCLL December 2014 draft determination did not take into account regulatory best practice such as the EC's recommendation.[685]

1302. WIK also submitted that the application of ORC to all assets is not in line with current regulatory developments or operator behaviour,[686] noting statements from Chorus that 40% of its UFB deployment is based on existing trenching. [687, 688] WIK argued that a profit-maximising operator would reuse existing assets for the deployment of a new network as long as the opportunity cost of using existing assets are lower than the greenfield cost of a new replacement network.

1303. WIK also argued that the Commission's "orthodox" view of TSLRIC for the UCLL service is becoming out-dated due to changes that have occurred in Australia and the European Union. WIK notes that under the EC's "brownfield" approach, regulators should not assume the construction of an entirely new civil infrastructure network for deploying NGA.[689]

1304. Given the difficulties of implementing such an approach in the context of a cost model, WIK proposed a "pragmatic" allowance for asset reuse, by deducting 20% from the investment cost of a new network. WIK said that based on its experience, such a general deduction would reflect the difference between "brownfield" (with reuse) and "greenfield" (no reuse) costs of deployment.[690]

1305. In WIK's view, an allowance for reuse is more consistent with other modelling decisions in the Commission's draft determination, including the use of scorched

[684] One drawback of a DORC methodology is that it requires additional information, in particular relating to the average age of the assets being valued (and the expected remaining life of the assets).

[685] Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [F1.1].

[686] WIK "Submission in response to the Commerce Commission's "Draft pricing review determination for Chorus' unbundled bitstream access service" and "Draft pricing review determination for Chorus' unbundled copper local loop service"" 20 February 2015, paragraph [37].

[687] WIK "Submission in response to the Commerce Commission's "Draft pricing review determination for Chorus' unbundled bitstream access service" and "Draft pricing review determination for Chorus' unbundled copper local loop service"" 20 February 2015, paragraph [37].

[688] Ibid, paragraph [54].

[689] Ibid, paragraph [42].

[690] Ibid, paragraph [59].

node optimisation and the use of existing sites for FWA.[691] Wigley and Company makes a similar point, that we are applying a scorched node approach to optimisation "which enables widespread use of re-usable assets."[692]

1306. Wigley and Company also argued that TSLRIC modelling is substantially the same as for the TSO, noting that the Commission has previously referred to the TSO cost determinations as being consistent with TSLRIC[693]. According to Wigley and Company, the Supreme Court decision is binding on the Commission and requires historic cost or similar to be used instead of ORC.[694] Wigley and Company also noted that the Australian Competition Tribunal has rejected the use of ORC in relation to Telstra's hypothetical new entrant valuation model; that the EC has recommended that trenches be valued at historic cost; and that we do not apply ORC to reusable assets in the context of electricity and gas.[695]

1307. Wigley and Company also claimed that ORC valuation is inconsistent with Professor Vogelsang's view that re-use of existing civil works is usually the most efficient way forward, and that historic cost is generally more predictable than a replacement cost approach.[696]

1308. CEG submitted that if an asset remains in use, it will continue to have a forward-looking value, and it would be inappropriate to exclude fully depreciated assets from a forward-looking costing. [697]

1309. In relation to Vodafone's comment on the reuse of existing assets of telecommunications operators and other utilities, we have allowed for some sharing of infrastructure between the hypothetical efficient operator and other utilities such as electricity companies. Our approach to infrastructure sharing is discussed in Attachment D.

1310. In our view, a concern with historic cost valuation is the treatment of fully depreciated assets which remain in use. The exclusion of fully depreciated ducts could send a negative signal for future investment and potential bypass. To this extent, the use of a historic cost valuation is likely to undermine the objective of promoting efficient build/buy investment decisions.[698]

691 Ibid, paragraphs [62], [63].
692 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [12.2].
693 Ibid, paragraph [13.13].
694 Ibid, paragraph [13.6], [13.15].
695 Ibid, paragraph [13.17].
696 Ibid, paragraph [14.2].
697 CEG submission "Uplift asymmetries in the TSLRIC price" 20 February 2015, paragraph [116].
698 We also note that under the regulatory framework established under Part 4 of the Commerce Act, fully depreciated assets would not necessarily be priced at zero (which is what would occur under the EC recommendation) under the initial asset valuation if that would result in a significant downward price shock which was inconsistent with section 52A(1)(a) of the Commerce Act (which relates to incentives to innovate and invest in replacement, upgraded, and new assets).

1311. The exclusion of fully depreciated ducts would also appear to be inconsistent with the reference to "total quantity" of facilities and functions which is part of the definition of TSLRIC in the Act, as well as the reference to "long-run" which, as we discuss in Chapter 1, is a period over which all factors of production can be varied.

1312. Another concern with the use of historic costs as a basis for valuing assets is that it may not be informative about forward-looking TSLRIC-based costs. WIK has previously identified this as a drawback of historic cost pricing (see paragraph 1267.2 above). The costs that have been historically incurred by Chorus in deploying ducts are unlikely to reflect, in the words of the Court of Appeal, "the costs of an efficient access provider over a sufficient period of time (long-run), on a "forward-looking" basis (reflecting the notional costs to an operator if it built a new network) rather than of Chorus's actual costs."[699]

1313. In relation to WIK's proposal to apply a 20% deduction to investment costs, we note that WIK's 20% deduction is not substantiated or supported by evidence in WIK's submission.

1314. WIK simply claim that the 20% is based on its experience of the savings that can be achieved by a "brownfield" deployment that allows for re-use of assets. It is not clear to us how or to what extent WIK has taken account of factors such as the proportion of Chorus underground network which is ducted (as opposed to directly buried) and hence capable of being re-used, and the average age of ducts in New Zealand relative to other jurisdictions in which WIK has experience.

1315. We note that according to information supplied by Chorus in response to a section 98 request, while Chorus has been targeting 40% of its UFB deployment using existing ducts, the proportion of Chorus' underground network that is ducted is significantly lower on a nationwide basis than it is in Chorus' UFB areas. Chorus has also been investing a significant amount in new ducts for the UFB build in recent years. The average investment in ducts in each of 2012, 2013, and 2014 was [ ]**CNZCI**, compared to an average annual investment of [ ]**CNZCI** over the period from 2005-2011.[700]

1316. We asked TERA to estimate the impact of allowing re-use of existing ducts, based on the information provided in Chorus' response to the section 98 request, including the proportion of Chorus' underground network which is ducted and the 2014 net book value recorded for ducts. TERA estimated that the resulting price for the UCLL service (with re-use) would be approximately 9% lower than our base case price.

1317. We do acknowledge that the use of historic cost to set regulated access prices has some advantages, such as potentially ensuring there is neither over- or under-recovery of historically incurred costs. WIK has previously referred to this as an attraction of historic cost valuation.

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699 *Chorus v Commerce Commission* [2014] NZCA 440 at [30].

700 Derived from Chorus "CONFIDENTIAL INFORMATION (CI) Copy of Response to Commerce Commission s98 request Q2 2".xlsx

1318. This also appears to have been a consideration which prompted the EC's recommendation on the treatment of what it refers to as re-usable but "non-replicable" assets, as well as the ACCC's move away from TSLRIC-based pricing for fixed access services.

1319. However, for the reasons outlined earlier in this draft determination, we consider that there are some important differences between New Zealand and the European Union, such that, on balance, there is not a sufficiently strong case to follow the EC and move away from the traditional approach to implementing TSLRIC.

1320. In our view, the EC approach for reusable civil engineering assets is unlikely to assist in determining the forward-looking TSLRIC of the UCLL and UBA services under the FPP.

1321. A number of submissions have also referred to recent developments in Australia. We note that in its 2010 review of pricing principles for fixed line access, the ACCC ended up moving away from the TSLRIC pricing principle and towards a "building blocks" approach.[701] According to the ACCC:[702]

> In telecommunications, both in Australia and internationally, the forward looking perspective to measuring TSLRIC+ for fixed line services involved continually revaluing the existing sunk assets used in providing these services. This revaluation was based on the asset's optimised replacement cost and occurred each time a pricing determination was made. …
>
> In recent times, a consensus appears to have been reached among industry participants that a BBM ("building block model") should replace TSLRIC+ as the pricing approach to telecommunications services. All submissions to the Discussion Paper were in favour of moving to a BBM.

1322. The ACCC noted that the main difference between the BBM and TSLRIC+ is that under the former, asset values are "locked-in" using an initial regulatory asset base (RAB) as the basis for setting indicative prices.[703,704]

1323. Although the ACCC has moved away from the TSLRIC pricing principle and replaced it with a "building blocks" approach for fixed line services in Australia, the FPP that we are required to implement in relation to the UCLL service remains forward-looking TSLRIC.

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701 ACCC "Review of the 1997 telecommunications access pricing principles for fixed line services Draft Report" September 2010.

702 ibid, pp. 15 and 16.

703 ibid, p. 17.

704 The ACCC has also noted that "there is no uniquely 'correct' value for the initial RAB. An element of judgement is therefore required to determine a suitable range of potential values for Telstra's sunk investment in network assets and then to settle on a value within this range that forms a sound basis for estimating prices." ACCC, "Inquiry to make final access determinations for the declared fixed line services" July 2011, p. 37.

Our preference is for ORC applied to all assets

1324. Having considered the points raised in submissions, cross submissions, and at the FPP conference, we remain of the view that ORC is the most appropriate asset valuation methodology to apply to all assets when determining a regulated price in accordance with a TSLRIC-based FPP.

Attachment F: Asymmetric risk

Purpose

1325. This Attachment outlines how we have treated the issue of compensation for asymmetric risks in our TSLRIC model for the UCLL service. We discuss our earlier views in respect of the treatment of asymmetric risks, views of submitters, and our subsequent analysis and draft decisions.

Our draft decisions

1326. Our draft decisions in respect of asymmetric risks are:

1326.1 to provide for an *ex ante* allowance for the asymmetric risk of catastrophic events, through the use of Chorus' costs as a starting point for the costs incurred by a hypothetical efficient operator, including insurance costs, and with appropriate efficiency adjustments (as discussed in Attachment M – Opex regarding the efficiency adjustments we apply to opex);

1326.2 to provide for an *ex ante* allowance for the asymmetric risk of asset stranding due to technological change, by adopting asset lives that recognise the risk of asset stranding; and

1326.3 to not provide any *ex ante* allowance for the asymmetric risks of asset stranding due to competitive developments or future regulatory decisions regarding re-optimisation.

Relevance of asymmetric risks to TSLRIC

1327. A firm faces asymmetric risk when its distribution of returns is truncated at the one extreme, without an offsetting truncation at the other end. The two main forms of asymmetric risk are:[705]

1327.1 risks that arise through infrequent events that could produce large losses, such as natural disasters and terrorist threats; and

1327.2 risks that derive from events such as the threat of technology change, competitive entry or expansion.

1328. We have previously considered asymmetric risks in the context of regulating services under Part 4 of the Commerce Act 1986. Such risks will exist within the telecommunications sector. While a number of the relevant issues we need to consider will be the same in the Part 4 and telecommunications contexts, we note that:

[705] See Commerce Commission "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper" 22 December 2010, paragraph [H12.4].

1328.1 asset valuation under TSLRIC that is based on optimised replacement costs for a hypothetical efficient operator is quite different to regulation under Part 4 where actual investment is recorded in the regulatory asset base and a return of and on capital is preserved, which significantly mitigates asset stranding risk in Part 4 regulation; and

1328.2 our expectations are that the rate of technological change in telecommunications is greater than that for services regulated under Part 4, which carries with it a greater risk of investments becoming obsolete.

1329. In our December 2014 UCLL draft determination paper, we considered whether to provide for an *ex ante* allowance for asymmetric risks in the following four categories:[706,707]

1329.1 Catastrophic risks.

1329.2 Asset stranding due to technological change.

1329.3 Asset stranding due to competitive developments.

1329.4 Asset stranding due to future regulatory decisions (re-optimisation).

1330. In the sections below we outline our approach to the treatment of asymmetric risks for each of these categories, including considering submissions and cross submissions on the relevant issues.

Catastrophic risks

Preliminary views in the December 2014 UCLL draft determination paper

1331. In our December 2014 UCLL draft determination paper we provisionally decided to provide an *ex ante* allowance for catastrophic risk.[708] Our draft reason for this was that we would expect the hypothetical efficient operator to incur efficient costs and prudently insure against catastrophic risk. We included an allowance for the asymmetric risk of catastrophic events in our TSLRIC model by:

1331.1 including costs for seismic bracing and backup generators; and

1331.2 using Chorus' insurance costs, which provide cover for catastrophic events.

Views of submitters

1332. In its submission, Chorus agreed that we should include *ex ante* compensation for catastrophic risk, but did not agree that these risks are adequately compensated for

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[706] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [701.2].

[707] We noted also in our December 2014 UCLL draft determination paper that we would not consider further the issue of an *ex post* allowance for asymmetric risks. We continue to hold this view.

[708] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [703].

by including costs for seismic bracing and backup generators.[709] Chorus, along with its consultants CEG, noted that Chorus incurs capital expenditure on risk management in other areas, such as fire protection, lightning protection and security.[710]

1333. In addition, Chorus and CEG submitted that not all of Chorus' catastrophic event risks can be, or are, insured against.[711] For example, CEG stated in its submission that Chorus' insurance for catastrophic risks does not include coverage for distribution and transmission lines outside CBD areas of the five major cities, or for events arising from riots, or acts of terrorism or war.[712]

1334. In contrast, Vodafone and WIK agreed that catastrophic risk would be insured against by the hypothetical efficient operator,[713] and WIK agreed with our approach to consider insurance costs and costs for seismic bracing and backup generators to compensate for this risk.[714]

1335. In cross submissions, Spark submitted in response to Chorus' argument for additional *ex ante* compensation for catastrophic risk that the MEA network used in the TSLRIC model delivers functionality greater than Chorus' existing copper network, so this inherently compensates for catastrophic risk.[715]

1336. WIK's cross submission report for Spark and Vodafone noted that we have already explicitly accounted for asymmetric catastrophic risk by including allowances for insurance for catastrophic risk, as well as costs relating to seismic bracing and backup

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709 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraphs [671]-[672].

710 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [673]; CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [64].

711 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [674]; CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [61].

712 CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [61].

713 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [K3]; WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop service including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [77].

714 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop service including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [77].

715 Spark "UBA and UCLL FPP pricing review draft decision" CONFIDENTIAL, 20 March 2015, paragraph [236a].

generators.[716] Furthermore, WIK stated that the WACC parameters compensate for any residual uninsurable risk.[717]

Our current draft views

1337. We continue to hold the view that we should include *ex ante* compensation for catastrophic risk in our TSLRIC model. Consistent with our regulatory framework to consider the efficient costs incurred by a hypothetical efficient operator, we consider that the efficient costs of a hypothetical efficient operator would include costs arising from catastrophic risks.

1338. We note also in this regard that an *ex ante* allowance for catastrophic risk is consistent with the efficiency properties of TSLRIC provided for by the TSLRIC objectives/outcomes that we give weight to. For example, reflecting the efficient costs associated with catastrophic risks is consistent with efficient cost recovery and providing incentives for cost minimisation.

1339. In respect of Chorus' and CEG's view noted above that there is additional capital expenditure on risk management (beyond that for seismic bracing and backup generation) that is not accounted for in our model, we note that we have used cost data provided by Chorus as a starting point to determine the costs for assets required by the hypothetical efficient operator to dimension the network. To the extent that Chorus' costs reflect the range of costs incurred by Chorus in respect of catastrophic risk management, then this would provide sufficient allowance for catastrophic risk. We note also that we have adjusted Chorus' costs to reflect the likely costs of a hypothetical efficient operator, as discussed in Attachment M – Opex regarding the efficiency adjustments we apply to opex.

1340. We agree with Chorus and CEG's view that there may be some catastrophic event risks which are not specifically insurable. Nonetheless, we would expect that diversification would minimise the impact of uninsurable catastrophic event risks. Prudent investors in our hypothetical efficient operator would be diversified across a range of locations, sectors and asset classes. Moreover, the hypothetical efficient operator itself would also be diversified across different geographies and asset types (eg, underground versus overhead assets). Therefore, the impact of catastrophic event risks that occur in one particular geographic area or influence one particular asset type, for example, can be expected to be mitigated through diversification.

1341. Uninsurable catastrophic event risks may also have a relatively minor impact. As an indication of the possible impact of certain natural disasters on the cost of capital, in

[716] WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service unbundled copper local loop services including the cost model and its reference documents - TSO/geospatial modelling related aspects" 31 March 2015, paragraph [70].

[717] WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service unbundled copper local loop services including the cost model and its reference documents - TSO/geospatial modelling related aspects" 31 March 2015, paragraph [70].

our recent Orion customised price path decision we noted that the cost of natural disasters would likely have a less than 0.1% impact on the WACC.[718]

1342. As a final point, we also note the following in regards to certain catastrophic events, such as riots, acts of terrorism and war.

1342.1 We consider that there is a low probability of these events occurring in New Zealand, particularly in respect of acts of war but also to a lesser extent riots and terrorism, and so we query the materiality of the expected losses that would arise from these events.

1342.2 Some of the expected losses arising from some of these events (such as acts of war) might be considered systematic risks affecting all firms in the market, so could be captured in the asset beta. We are not convinced that between insurance, the asset beta and the hypothetical efficient operator's operating expenditure (eg, via repairs and maintenance) that there is any material residual asymmetric risk arising from riots, terrorism or war that requires compensation.

1342.3 Events such as acts of war are likely to result in a response from the government, and we do not consider they should be events that the regulatory regime should attempt to provide compensation for.

1343. Our draft decision therefore remains that we will provide for *ex ante* compensation for catastrophic risk in our TSLRIC model through the use of Chorus' insurance costs and other costs (including for seismic bracing and backup generation) as the best available information on the likely costs incurred by our hypothetical efficient operator. We note also that these costs have been adjusted to reflect the greater efficiency of our hypothetical efficient operator compared with Chorus, as discussed in Attachment M – Opex.[719]

Asset stranding due to technological change

Preliminary views in the December 2014 UCLL draft determination paper

1344. In the December 2014 UCLL draft determination paper we recognised the greater level of technological change in the telecommunications sector that may result in future asset stranding, and provisionally decided to provide an *ex ante* allowance for

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718 Commerce Commission "Setting the customised price-quality path for Orion New Zealand Limited" 29 November 2013, paragraph [C31]. The estimate was based on the Global Assessment Report on Disaster Risk Reduction estimate of the total expected global loss from earthquakes and cyclone wind damage as around US$180 billion per annum. Relative to the market value of capital provided to listed companies, this implied a cost of 0.30% per dollar of capital per annum. As some of the cost of loss would be insured, and shared amongst various parties, we considered that the impact on the cost of capital would be substantially less than 0.30% per annum, and almost certainly less than 0.1% per annum.

719 For example, the 40% fibre efficiency adjustment discussed in Attachment M – Opex is applied to network insurance, but not to non-network insurance. We consider this to be appropriate to reflect the likely difference in insurance premiums between Chorus' old copper network and the hypothetical efficient operator's new fibre network. This difference is unlikely to be as stark in respect of insurance for non-network assets.

asset stranding due to technological change.[720] We provided this allowance by adopting Chorus' asset lives, which we considered recognised the risk of asset stranding.

Views of submitters

1345. Vodafone, along with its consultants WIK, submitted that the risk of asset stranding due to technological change is anticipated by network owners, and so is a systematic risk that is already reflected in the asset beta of the WACC.[721] Vodafone, WIK and Network Strategies have also all submitted that the approach to asset stranding due to technological change set out in the December 2014 UCLL draft determination paper is inconsistent with the approach taken by other regulators (although we were not provided with any evidence as to the approach taken by other regulators).[722]

1346. Wigley and Company similarly submitted that technological change in telecommunications is dealt with through the asset beta in the WACC. It submitted also that Chorus is somewhat insulated from asset stranding risks due to the subsidised UFB roll-out, and that technological change can also create opportunities for new services and increased revenues.[723]

1347. Chorus agreed with the Commission that compensation should be included for the risk of asset stranding due to technological change, but submitted that adopting Chorus' asset lives did not compensate for this risk.[724] Chorus submitted that this was because of limitations in its financial statements to adequately consider technological obsolescence, including that the accounts only reflected actual events that have occurred or assumptions of known developments in the immediate future, and that they were developed to meet particular accounting standards.[725] CEG noted

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720 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [711].

721 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [K3]; WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop service including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [78].

722 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [K3]; WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop service including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [78]; Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, p. 83.

723 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraphs [10.29]-[10.31].

724 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraphs [677]-[679].

725 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update

that the accounting standard appears to be to provide for asset impairment only when a certain threshold of certainty is reached that an asset will become obsolete.[726]

1348. L1 Capital submitted a similar view in respect of accounting decisions on asset lives. It noted that for active assets like switches and DSLAMs, asset lives do incorporate some of the issues relating to stranding due to technological change, because auditors can observe a regular pattern of replacement. However, for underground assets, L1 Capital submitted that they are typically reported in financial accounts at their physical lives, rather than reflecting any stranding risk.[727]

1349. In cross submissions, Vodafone submitted that a number of conservative assumptions used in determining the TSLRIC-based price protect against asymmetric risk, and any further adjustment would be double counting.[728] Network Strategies, in its cross submission report for Spark and Vodafone, stated that Chorus' participation in the UFB process signalled it had taken into account any potential stranding of its existing legacy infrastructure.[729]

1350. WIK, in its cross submission report for Spark and Vodafone, noted in regards to asset lifetimes in the financial accounts that it is a fair assumption that Chorus has made a prudent choice of asset lifetimes.[730] WIK also stated that, because major parts of Chorus' assets are fully depreciated but still in use, then these are not stranded assets. WIK argued that to apply shorter asset lives to these assets serves no efficient purpose.[731]

1351. CEG, in its cross submission report for Chorus, disagreed with the submissions of Vodafone and WIK, and stated that technological change does create diversifiable risk that is not captured in the asset beta.[732] CEG went on to note that if there is some positive probability of asset stranding, then the probable cost of this must be included in the modelled cash flows.[733] Analysys Mason made a similar point, noting that if there is a material probability of asset stranding in the future, then expected

Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [679].

726 CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [96].

727 L1 Capital "Submission on draft UCLL and UBA pricing review determinations" 20 February 2015, p. 12.

728 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, paragraphs [D4.1]-[D4.3].

729 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 71.

730 WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 19 March 2015, paragraph [71].

731 WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 19 March 2015, paragraph [72].

732 CEG "Issues from submissions UCLL and UBA" March 2015, paragraph [44].

733 CEG "Issues from submissions UCLL and UBA" March 2015, paragraph [53].

economic lifetimes of assets are reduced, and this effect needs to be taken into account.[734]

1352. Chorus also disagreed with the submissions of Vodafone and WIK that the risk of asset stranding due to technological change is captured in the asset beta. Chorus submitted that:[735]

1352.1 it is "unsafe" to assume that all telecommunications operators face the same or similar risk of technological change;

1352.2 the current comparator set used to determine the asset beta has limitations regarding the extent to which it provides a comparison with New Zealand conditions; and

1352.3 the asset beta does not compensate for the truncation of returns caused by technological change.

Our current draft views

1353. We agree with Vodafone, WIK and Wigley and Company that, to the extent that some of the risk of technological change in telecommunications is systematic risk, then this will be captured in the asset beta of the WACC.

1354. However, while some of the risk of technological change may be systematic (or market) risk that is related to the state of the market as a whole, there may also be non-systematic elements to this risk, which are unique to the firm. We agree with Chorus' cross submission, which notes that different telecommunications firms (eg, new entrants, incumbents and those with international business activities) are likely to face differing levels of exposure to technological change.[736] Indeed, the set of comparator firms used to estimate the asset beta of the WACC cover a wide range of telecommunications businesses. While there may be some implicit allowance for technological change reflected in these businesses' asset betas, it is impossible to know the extent to which it differs from the hypothetical efficient operator's exposure to technological change.

1355. Professor Vogelsang comes to a similar conclusion, where he notes that the risk of technological change is not fully reflected in the asset beta. Nonetheless, he states

[734] Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross submission" CONFIDENTIAL, 20 March 2015, paragraph [2.9.2].

[735] Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraphs [301]-[303].

[736] Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [301].

also that there may be some element of technological risk that is captured in the beta, but it is unclear how large this effect is.[737]

1356. In respect of non-systematic risks associated with asset stranding, there may be a (partially) mitigating factor. In particular, we agree with the point made by Wigley and Company that technological change can result in positive cash flows, due to opportunities for new and better services. Nonetheless, it is not clear that these positive cash flows would be sufficient to ensure that any risks associated with asset stranding are symmetric, particularly given the greater level of technological change in the telecommunications sector.[738]

1357. On balance, and particularly in light of the extent of technological change that occurs in the telecommunications sector, we continue to hold the view that there may be some asymmetric risk of asset stranding that requires *ex ante* compensation. Faced with some expectation that technology change will strand the hypothetical efficient operator's existing assets, we would expect this firm to set higher prices so as to recover the efficient costs of those assets over their expected economic lifetime. In this regard, we consider that an *ex ante* allowance for asset stranding risk due to technological change is consistent with the efficiency properties of TSLRIC provided for by the TSLRIC objectives/outcomes that we give weight to. For example, reflecting the efficient costs associated with asset stranding risks is consistent with efficient cost recovery and providing incentives for cost minimisation.

1358. Turning now to the question raised by submissions of Chorus, CEG and L1 Capital, which is whether adopting Chorus' asset lives adequately compensates for this risk. We recognise that asset lives which are developed to meet accounting standards may not necessarily take into account the risk of asset stranding in precisely the same way as would be reflected in the economic lifetime of assets. Nonetheless, the evidence we have before us is that Chorus' asset lives do at least take into account to some extent the potential for obsolescence due to technological change. In particular we note the following points.

1358.1 Chorus' 2014 Financial Statements noted that:[739]

> The determination of the appropriate useful life for a particular asset requires management to make judgements about, amongst other factors, the expected period of service potential of the asset, the likelihood of the asset becoming obsolete as a result of technological

[737] Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [45].

[738] As noted above, Wigley and Company also suggest that Chorus is insulated to some extent from asset stranding risks due to the subsidised UFB roll-out, as copper that is stranded by fibre could result in customers shifting from one part of Chorus' business to another. We note, however, that this reflects the risk of asset stranding to Chorus, not the hypothetical efficient operator. While we are considering only the risk of asset stranding to the hypothetical efficient operator, we note in respect of the risk of asset stranding to Chorus that any insulation of stranding risks only applies to the extent that copper is displaced by fibre (rather than other technologies), in areas where Chorus is the UFB provider, and over the remaining lifetime of Chorus' copper assets.

[739] Chorus "Financial Statements for the year ended 30 June 2014" August 2014, p. 10.

advances, the likelihood of Chorus ceasing to use the asset in its business operations and the effect of government regulation.

1358.2 Chorus stated at the conference that the essence of the lifetimes in its accounts is economic lifetimes, where a reasonable decision is made as to how long the assets will have economic value.[740]

1358.3 In further information provided by Chorus as to how the asset lives in its financial accounts are calculated, Chorus stated that it "reviews the useful life of assets annually, assessing the expected period of service, and the likelihood of the asset becoming obsolete as a result of technology advances".[741]

1359. As noted above, CEG discussed the accounting standard for asset impairment, and stated that this standard provides for asset impairment only when a certain threshold of certainty is reached that an asset will become obsolete. We note, however, that the accounting standard for asset impairment relates, in broad terms, to writing off an asset. The decision to write off an asset is different to the decision that needs to be made by accountants setting an asset's lifetime.

1360. At the conference, CEG noted that (if it were the case that the asset lifetimes used in Chorus' accounts were not appropriate), then there is no easy solution to the problem of setting appropriate economic lifetimes for assets.[742] CEG suggested undertaking sensitivity analysis on the asset lifetimes, as a way of testing the impact of different asset lives.

1361. Along the lines of CEG's suggestion to undertake sensitivity analysis, we have obtained some evidence on the likely physical/engineering lives of the different asset classes in our TSLRIC model. In Table 12 below we report the economic lifetime of the asset classes used in the TSLRIC model, and additional information we have obtained on engineering lifetimes. We note that we could not obtain data on engineering lifetimes for all asset classes,[743] and for some asset classes we only obtained a likely range for the engineering lifetime.

1362. Using the data on economic lifetimes and engineering lifetimes, we calculated the increase in the discount rate that would be required to equate the present value of the annual cash flows from a constant annuity over the engineering lifetime, with the same present value over the economic lifetime. For example, for overhead copper cables, a constant annuity of $100 per annum over an economic lifetime of 14 years has a present value of $945 at a discount rate of 6.03% (the WACC used in this draft determination). To determine the same present value of the $100 annuity over the

[740] Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 294.

[741] Chorus "Commission's follow up questions following FPP conference" Confidential, 12 May 2015, Question 3.

[742] Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 296.

[743] In particular, we did not obtain data for the engineering lifetimes of copper distribution points (overhead and underground), fibre distribution points, FWA spectrum and base stations, and DWDM sites.

engineering lifetime of 100 years requires a discount rate of 10.58%: an increment of 4.55%.[744] This approach assumes continuous compounding of the discount rate and "sudden death" – that the asset lasts exactly its lifetime without degrading, followed by a sudden instantaneous death.[745] We note also that the increment in the discount rate is equivalent to the implicit survival rate. For example, a 2% increment to the discount rate to account for the risk of asset stranding is equivalent to assuming that there is an 18% chance that the network will be completely stranded in 10 years.[746]

The results for each asset class are shown in Table 12.

744 Note that the results are invariant to the value of the annuity, so we have normalised to $100. In addition, where we only obtained data on the likely range for the engineering lifetime, we used the midpoint of the range in our calculations.

745 An alternative is to assume exponential decay, whereby the asset can be considered to decay as it ages. It is possible to undertake similar calculations, based on an assumed distribution for the rate of decay. Using a Poisson distribution for the rate of decay generally results in higher increases in the discount rate compared with those for the sudden death case. The algebra for the calculations we have undertaken, for both the sudden death and exponential decay case, can be found in Avinash K. Dixit and Robert S. Pindyck (1994), *Investment Under Uncertainty*, Princeton University Press, pp.200-205.

746 Based on 18% = 1-exp(-0.02 x 10).

Table 12: Comparison of economic lifetimes with engineering lifetimes by asset class

Asset class	Economic lifetime used in TSLRIC model (years)	Engineering/physical lifetime (years)	Increment to 6.03% discount rate to equate present value of economic lifetime with engineering lifetime
Copper cables overhead	14	100	4.55%
Copper cables underground	20	100	2.58%
Fibre cables	20	100	2.58%
Copper joints overhead	14	50-100	4.54%
Copper joints underground	20	50-100	2.56%
Fibre joints	20	50-100	2.56%
Ducts	50	100	0.30%
Trenches	50	100	0.30%
Poles	20	50	2.45%
Manholes	50	50	0.00%
Street cabinets	14	20-50	4.26%
MDF	20	30-50	2.27%
ODF	20	30-50	2.27%
Landing station for submarine links	20	50	2.45%
Submarine cable	20	30	1.74%

1363. The results shown in above suggest that both the economic lifetimes for many asset classes are substantially lower than the engineering lifetimes,[747] and that the magnitude of the implied increments to the discount rate from using engineering lives rather than economic lives are relatively large. We consider that this implies that we have adequately taken into account the possibility of asset stranding.

1364. We note also L1 Capital's view referred to above that, at least for assets with a shorter economic life, auditors can incorporate some of the issues relating to stranding risk because they can observe a regular pattern of replacement.

1365. On balance, we are satisfied that the asset lives incorporated into the model provide adequate compensation for the asymmetric risks associated with asset stranding due to technological change.

[747] This is in contrast to L1 Capital's view, noted above, that underground assets are typically reported in financial accounts at their physical lives.

1366. We have also considered the submission of CEG, that notwithstanding whether asset lives adequately account for the asymmetric risks of asset stranding, to the extent that asset lives represent an expected life, then their use undercompensates Chorus or the hypothetical efficient operator.[748]

1367. While we do not dispute the mathematical analysis underlying CEG's claim,[749] to the extent that any downward bias did exist, it is not clear how this could be removed. CEG suggested formulating expectations of asset lives, but given the difficulties in determining a single economic lifetime for a particular asset (which as noted at paragraph 1360 above CEG appears to acknowledge), there is unlikely to be any robust and objective basis for determining multiple possible lifetimes (and the associated probabilities of occurrence) for a given asset.

1368. We agree also with the comments of Professor Vogelsang, who has stated that "[w]ithout concrete data it is hard to assess the size of this effect".[750]

1369. Accordingly, we do not consider that any further adjustment is warranted to address this effect regarding expected asset lives raised by CEG, to the extent that it may be relevant.

Asset stranding due to competitive developments

Preliminary views in the December 2014 UCLL draft determination paper

1370. In the December 2014 UCLL draft determination paper we provisionally decided not to provide an *ex ante* allowance for asset stranding due to competitive developments.[751] Our reasoning for this was that, while competitive developments may leave assets stranded, it is difficult to separate the risk of asset stranding through competitive developments from that of technological change. Since we had already provided for *ex ante* compensation for the latter, we considered it was not appropriate to provide an additional *ex ante* allowance for the former.

Views of submitters

1371. Vodafone and WIK both agreed that allowances for asset stranding due to competitive developments were not appropriate, although neither submitter elaborated on their reasons for this.[752]

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748 CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [104].

749 Which itself is based on Michael A. Salinger (1999), "Lowering Prices with Tougher Regulation: Forward-Looking Costs, Depreciation, and the Telecommunications Act of 1996" in *Regulation Under Increasing Competition*, Michael A. Crew (ed.), Kluwer Academic Publishers.

750 Ingo Vogelsang "Reply to Comments on my November 25, 2014, paper "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand"" 23 June 2015, paragraph [21].

751 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [722].

752 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [K3]; WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and

1372. CEG agreed with the Commission that competition promotes the use of new and better technologies. However, CEG noted that asserting the benefits of competition does not provide a reasonable basis to ignore the potential for competition to give rise to asymmetric risk.[753]

1373. In its cross submission, Chorus noted that asset stranding due to new entry and changes to the demand base will not be taken into account in consideration of the asymmetric risk arising from technological change. Chorus submitted that these are further risks which should be accounted for.[754]

Our current draft views

1374. We address first CEG's submission, referred to above. CEG submitted that in the December 2014 UCLL draft determination paper we asserted the benefits of competition as our basis for rejecting *ex ante* compensation for asset stranding due to competitive developments.

1375. We disagree with CEG that this was our reasoning for rejecting *ex ante* compensation for asset stranding due to competitive developments. Rather, the reasoning we set out in the December 2014 UCLL draft determination paper was that it is difficult to separate the risk of asset stranding through competitive developments from that of technological change, and as we had already provided *ex ante* compensation for the latter, it would be double counting to also provide *ex ante* compensation for the former.

1376. There has been no evidence presented to suggest that we should change our view here. To the extent that competition manifests itself through technological change, it is appropriate to provide for *ex ante* compensation, and this has already been provided for as discussed above.

1377. We note additionally that competition may manifest itself through other forms, such as through competition from new entrants or existing providers on existing technology platforms, as suggested in Chorus' cross submission referred to above. However, there is an inherent circularity in reflecting any *ex ante* compensation for this form of competition. Typically competition manifests itself in prices falling, rather than rising. Indeed, we would not expect a hypothetical efficient operator to raise prices *ex ante* to compensate for the risk of asset stranding that arises from this competition, as to do so would encourage entry and/or competition that leads to the stranding in the first place.

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unbundled copper local loop service including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [79].

753 CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraphs [101]-[102].

754 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [307].

1378. Accordingly, we remain of the view that no *ex ante* compensation should be provided for the asymmetric risk of asset stranding associated with competitive developments.

Asset stranding due to future regulatory decisions

Preliminary views in the December 2014 UCLL draft determination paper

1379. In the December 2014 UCLL draft determination paper we provisionally decided not to provide an *ex ante* allowance for asset stranding due to future regulatory decisions in regards to re-optimisation of asset values.[755] We noted that our TSLRIC model provides for expected asset price trends, but there was no evidence of any material asymmetry arising from windfall gains or losses in either direction from deviations from those price trends. We also noted our concern regarding double counting of any write-down in asset values where such write downs reflected the introduction of new technologies.

Views of submitters

1380. Vodafone and WIK both agreed that allowances for asset stranding due to future regulatory developments were not appropriate, with WIK noting that the ORC asset valuation exceeds the actual valuation of Chorus' assets, implying a regulatory generosity rather than a regulatory risk.[756]

1381. Chorus submitted that the TSLRIC framework has the potential to strand both Chorus' copper network and the assumed investment of the hypothetical efficient operator, as the TSLRIC exercise is repeated in the future.[757]

1382. CEG, in its submission report for Chorus, stated that when the Commission reassesses the TSLRIC price and posits a new hypothetical efficient operator with a new lower cost technology, this will imply that this operator will not be able to cover its average costs over time.[758] CEG noted this will not necessarily be reflected in the asset price trends for the current efficient technology incorporated into the TSLRIC model, because that technology may be updated before the end of the assets' lives with a new more efficient technology.[759]

[755] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [726].

[756] Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys-Mason's TSLRIC models" 20 February 2015, paragraph [K3]; WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop service including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [80].

[757] Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [684].

[758] CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [70].

[759] CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [78].

1383. CEG submitted that to reflect this asset stranding due to regulatory optimisation, the Commission has three options, being to:[760]

1383.1 cease optimisation entirely;

1383.2 conduct modelling to anticipate and account for the arrival of new technologies; or

1383.3 compensate for these risks by considering their magnitude and providing compensation in the form of an uplift to the price.

1384. In its cross submission, Spark, in response to the submissions of Chorus and CEG, stated that there is no assumed investment in the TSLRIC-based price which will be stranded because TSLRIC seeks only to determine a proxy for the competitive market price. Spark submitted that, because Chorus' actual investment has been, or can reasonably be expected to be recovered with a TSLRIC-based price, there is no scope for any additional compensation.[761]

1385. At the conference, WIK and Network Strategies characterised FTTH/FWA as a "future proof" technology, and suggested that this implies there is limited ability for FTTH/FWA to be re-optimised at a future regulatory determination.[762] In contrast, Analysys Mason stated that we may not be able to foresee what technology supersedes what we build today, and that current technology built today will always be a legacy technology.[763]

Our current draft views

1386. While we recognise the possibility of future regulatory decisions resulting in the choice of a new MEA due to re-optimisation, we have concerns with respect to whether this requires any *ex ante* compensation at all, and if it does how such compensation would be implemented.

1387. In respect of whether to allow for *ex ante* compensation at all, we remain of the view expressed in the December 2014 UCLL draft determination paper that, to the extent that the choice of the new MEA in future regulatory determinations is driven by technological change, then this would already be accounted for in the *ex ante* compensation provided for due to the risk of asset stranding from technological change.

1388. Even if we were to provide for *ex ante* compensation due to asymmetric risk from future regulatory determinations, it is not clear how this would be implemented. CEG suggested that ceasing optimisation entirely is one possibility. However, we

[760] CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [85].
[761] Spark "UBA and UCLL FPP pricing review draft decision" CONFIDENTIAL, 20 March 2015, paragraph [236b].
[762] Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 302 and 308.
[763] Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 303.

consider that this would be contrary to the conceptual economic framework for TSLRIC, which bases wholesale regulated prices off the use of modern equivalent assets. Indeed, the risks associated with the choice of a new MEA are an implicit aspect of the TSLRIC approach, and we do not consider that we should alter this aspect of TSLRIC. We note also that to cease optimisation entirely might warrant a reconsideration of (and reduction in) the asset beta component of the WACC, reflecting the removal of any systematic component to the risk of re-optimisation due to technological change.[764]

1389. CEG suggested also that we could either conduct modelling to account for and anticipate the arrival of new technologies, or compensate for these risks in a price uplift. In our view any quantitative assessment of an uplift to the price would require modelling of the sort CEG anticipates, so that these two options presented by CEG are indistinguishable. We consider that any modelling undertaken in an attempt to capture multiple potential technologies in a tilted annuity is likely to be overly complex, informationally demanding and potentially subjective. Indeed, it would require knowledge of likely future technologies that could be used as a MEA, their costs, and the probability that they will be used as a MEA.[765]

1390. On balance, we remain of the view that it is not appropriate to include any *ex ante* allowance for the asymmetric risk associated with future regulatory determinations.

[764] This was the approach taken by the Commission in the TSO determinations. See Commerce Commission "Final Determination for TSO Instrument for Local Residential Telephone Service for period between 1 July 2004 and 30 June 2005" 10 September 2008, paragraph [217].

[765] At the conference CEG suggested we could undertake an objective assessment of the probabilities of likely different technologies (Commerce Commission, "UBA and UCLL pricing review determination conference transcript", 15-17 April 2015, p. 307). It is not clear to us that we would have any robust and objective basis for determining these probabilities.

Attachment G: Depreciation

Purpose

1391. This Attachment outlines how we have treated regulatory depreciation in our model.

Our further draft decision

1392. Our further draft decision is to maintain the view that the tilted annuity method is the appropriate methodology for regulatory depreciation.[766] This approach combines an allowance for depreciation with the return on capital.

Overview of depreciation

1393. Depreciation determines the amount of its asset base that the hypothetical efficient operator can recover each year through the regulated access prices. As telecommunications networks, and in particular the UCLL and UBA services, are capital intense, depreciation is a significant component of these services' forward-looking cost-based prices. Therefore, decisions about the choice of depreciation methodology and the inputs into the depreciation formula can directly affect these prices. In particular, these decisions can affect whether the hypothetical efficient operator's costs are recovered from current or future users of the hypothetical efficient operator's network.

1394. Due to a combination of physical deterioration, technical obsolescence, and contract terms, most of the hypothetical efficient operator's network and related assets have finite commercially useful lives. As these assets age, their future productive capacity and market value declines.[767] This loss of value is a cost that needs to be recovered over the life of these assets as part of the forward-looking cost-based prices charged for the service(s). Attachment H discusses how we set the asset lives used to calculate depreciation in detail.

1395. Changes in asset prices can also impact the depreciation included in forward-looking cost-based prices. This can occur due to factors such as inflation increasing the cost of comparable new assets (eg, wage inflation increasing the cost of laying cable) and technological development reducing the value of older assets. Attachment I discusses our approach to determining price trends.

Tilted annuities

1396. An annuity combines an allowance for depreciation with the return on capital.[768] Tilted annuities are consistent with the principles of financial capital maintenance and provide efficient incentives for build-buy decisions over time.[769]

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766 For calculating the hypothetical efficient operator's notional taxation, we have used diminishing value taxation.

767 Charles R. Hulten and Frank C. Wykoff (1996) "Issues in the measurement of economic depreciation: introductory remarks", *Economic Inquiry* 34, p. 10–23.

768 The return on capital is calculated by multiplying the value of assets by the cost of capital (ie, the financial return investors require from an investment given its risk).

1397. A standard annuity calculates the charge that recovers the asset's total purchase price and financing costs in annual sums that are constant over time.

1398. If the price of the asset is expected to change over time, a tilted annuity would be more appropriate. A tilted annuity calculates an annuity charge that changes between years at the same rate as the expected change of the asset value. This results in declining annualisation charges if prices are expected to fall over time, or vice versa when prices are expected to rise. Because of this feature, the tilted annuity approach is an approximation of economic depreciation as annual charges are brought in line with the expected value of the asset at each time of its economic life. As with a standard annuity, the tilted annuity should still result in charges that, after discounting, recover the asset's purchase price and financing costs.

1399. To calculate the tilt we used price trends for the key inputs into the hypothetical efficient operator's network assets. Attachment I explains how we calculated the price trends.

Consultation on alternative approaches to depreciation

1400. In our December 2013 UCLL process and issues paper and our December 2014 draft determination paper, we considered two other approaches to depreciation:

1400.1 *Economic-based depreciation* which captures the change in factors that determine the value of an asset from one period to the next; and

1400.2 *Straight-line depreciation* which is focussed on allocating the opening value of an asset across time periods.[770,771]

Economic depreciation

1401. Economic depreciation incorporates the various factors that affect the value of assets. There are a wide range of factors that determine the economic value of an asset, including expected revenue, its age, asset prices, technological change and demand.[772]

1402. Estimating economic depreciation is information intensive and requires forecasts of

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769 Further discussion on tilted annuities and depreciation can be found in Van Dijk Management Consultations, "Evaluating Economic Depreciation Methodologies for the Telecom Sector", which can be found at http://www.vandijkmc.com/en/expertise_3.aspx.

770 Commerce Commission "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" 6 December 2013, paragraph [146].

771 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [784-789].

772 Regulators in Belgium, The Netherlands and Norway apply forms of economic depreciation. Analysys Mason "Report for BIPT: BIPT's NGN/NGA Model version v1.0 documentation for industry players" 23 December 2011; Analysys Mason "Report for the Norwegian Post and Telecommunications Authority (NPT): Fixed Long Run Incremental Cost (LRIC), Model for Market 4 Response to operator consultation" 28 September 2012; Analysys Mason "Report for OPTA: Conceptual approach for the fixed and mobile BULRIC models" 20 April 2010; Analysys Mason "Report for Ofcom: Study of approaches to fixed call origination and termination charge controls" 15 May 2012.

how the various factors that affect the value of an asset are expected to change over a long time period. Due to the inherent shortcomings of forecasting over long periods, it is unclear whether economic depreciation provides a more accurate depreciation allowance than accounting-based approaches to depreciation.

1403. There is also a risk of creating a circular argument, as the calculation of economic depreciation depends on the expected development in revenue, which in turn depends on the calculated depreciation charge included in the regulated prices.

Straight-line depreciation

1404. Straight-line depreciation distributes an asset’s acquisition cost or opening value equally across the assumed life of the asset to produce an annualised depreciation charge.[773]

1405. Straight-line depreciation is often used in economic regulation, particularly outside the telecommunications industry, because, relative to other forms of depreciation, it is well understood, transparent and simple to calculate. Straight-line depreciation is also widely used by the accounting profession.

1406. The straight-line depreciation formula provides limited flexibility to take into account factors that are expected to affect asset values while the asset is in use. For example, the regulator can modify the assumed lifetime of the asset.

1407. However, the straight-line depreciation formula does not lend itself to modelling changes in the value of in-use assets or reflecting these changes in the forward-looking cost-based prices for specific services. Therefore, it is not as well suited to modelling the forward-looking cost of the hypothetical efficient operator in the context of a FPP as the tilted annuity approach.

Industry responses to our proposed approach in our December 2013 paper

1408. In the December 2013 UCLL process and issues paper, we outlined our preliminary choice of a tilted annuity approach and asked submitters whether an alternative depreciation approach should be used and if so, why it would be preferable.[774]

1409. Submitters responded as follows:

1409.1 Frontier Economics, for Vodafone, Telecom and CallPlus, submitted that a tilted annuity methodology should be used for depreciation, and that economic depreciation should not be used due to the complexities. In doing so, Frontier recommended against using straight-line depreciation given its tendency to front-load allowed revenues.[775]

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773 In practice, there may be adjustments for expected salvage values or disposal costs.

774 Commerce Commission “Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle” (6 December 2013), paragraph [167-168].

775 Frontier Economics "Determining a TSLRIC price for Chorus’ UCLL service - A report prepared for Vodafone New Zealand, Telecom New Zealand and CallPlus" February 2014, p. 41.

1409.2 Spark stated that economic depreciation would generally be preferred to the tilted annuity methodology in telecommunications cost models, but given that the economic depreciation methodology is difficult, a tilted annuity methodology may well provide an acceptable proxy for economic depreciation if all relevant factors are fully considered.[776]

1409.3 Both Chorus and Analysys Mason (for Chorus) submitted that an adjusted tilted annuity (with an additional tilt for demand changes) and economic depreciation would both be superior to a tilted annuity, given the possibility of a future migration to an alternative access technology. Chorus submitted that the adjusted tilted annuity may be an appropriate simplification to ensure the model results are delivered by December 2014.[777]

1409.4 Vodafone argued that a standard or straight-line annuity should apply to re-used assets, while a tilted annuity methodology (using CPI adjustments) should apply to assets valued at ORC.[778]

1410. None of the submissions we received changed our view, and in our July 2014 regulatory framework and modelling approach paper we stated that our view was still that a tilted annuity methodology is the most appropriate for our TSLRIC modelling exercise for two reasons.

1410.1 A tilted annuity methodology is the orthodox depreciation methodology used in electronic communications regulation, and we have previously adopted a tilted annuity methodology in the TSLRIC context. In our view this approach is therefore most consistent with our TSLRIC objective of predictability.

1410.2 Over the lifetime of the assets, a tilted annuity will result in a relatively constant rate of change in prices in a situation where a stable demand profile is modelled. This is expected to avoid windfall gains and losses being caused by changing network costs.

1411. We also noted that:

1411.1 While an economic depreciation methodology is considered to be the most robust methodology, it is the most complex to implement and the availability of the necessary information is limited.

1411.2 The tilted annuity methodology is a good proxy for economic depreciation where the demand profile is stable. Given that we have adopted a stable demand profile, a tilted annuity methodology is likely to produce a similar

776 Telecom "Submission on Process and issues paper for determining a TSLRIC UCLL price" 14 February 2014, paras [166-168].

777 Chorus "Submission in response to the Commerce Commission's Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle" 14 February 2014, paras [79] and [279]; and Analysys Mason "Report for Chorus - Response to Commission" 12 February 2014, p. [34].

778 Vodafone New Zealand Limited "Comments on process and issues paper for the unbundled copper local loop (UCLL) final pricing principle" 14 February 2014, recommendations 24 and 25, p. 28.

result to an economic depreciation methodology.

1411.3 Similarly, an adjusted tilted annuity methodology, as recommended by Chorus and Analysys Mason, is only superior to tilted annuity where demand is not stable.

Industry responses to our proposed approach in our July 2014 paper

1412. In response to our July 2014 Regulatory Framework and Modelling Approach paper, we received a number of submissions:

1412.1 Vodafone, Spark, and WIK, all supported a tilted annuity approach, but submitted that we should include an adjustment factor for both expected price, and demand changes.[779]

1412.2 Chorus maintained its position that an adjusted tilted annuity is superior to a tilted annuity. Chorus submitted that we:

> […] should be very careful when setting the depreciation profile so that it does not backload recovery of cost in a way that will make it practically impossible to recover the efficient cost of the network.[780]

1412.3 Chorus also submitted that:

> In order to achieve expected NPV neutrality over the regulatory period, the input price trends must, in total, reflect the expected change in the replacement cost of the assets over the regulatory period. There are two factors that need to be taken into account to ensure this outcome is achieved – the expected escalation in costs of the MEA being modelled and any effects of a change in the MEA.[781]

1412.4 Vodafone also commented that static demand is not required for proper application of the tilted annuity approach.[782]

1412.5 Analysys Mason submitted that we “should adopt a depreciation method which allows for the declining demand for UCLL as a result of fixed-mobile

779 Vodafone NZ "Submission to the New Zealand Commerce Commission - Comments on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, para [G8.1]; Telecom "UCLL and UBA FPP: consultation on regulatory framework and modelling approach - Submission Commerce Commission " 6 August 2014, para [142]; WIK-Consult "Report for Telecom New Zealand and Vodafone New Zealand - Submission - In response to the Commerce Commission’s ‘Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)’" 5 August 2014, paragraph [59].

780 Chorus "Submission in response to the Commerce Commission’s Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paras [126, 129]. We note that the model does not significantly backload cost recovery because the UBA price increment is stable.

781 Chorus "Submission in response to the Commerce Commission’s Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paragraph [128].

782 Vodafone NZ "Submission to the New Zealand Commerce Commission - Comments on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, paragraph [G8.2].

substitution and (as a minimum) loss of customers to non-Chorus LFC's."[783] We have responded to this in our draft decisions on demand, outlined in Attachment A and note that our TSLRIC model assumes constant demand.

1413. In our December 2014 draft determination paper we restated our preliminary view that a tilted annuity methodology is the most appropriate for our TSLRIC modelling exercise. In response to submissions on our July 2014 regulatory framework and modelling approach paper we noted that:

1413.1 the adjusted tilted annuity is only superior to the tilted annuity when demand is not considered to be constant. However as our preliminary view is that as a constant demand should be modelled, there is consequently unlikely to be a difference between using a tilted annuity or an adjusted tilted annuity.

1413.2 the proposed price trends and asset lifetimes used in the model have been chosen to achieve cost recovery and NPV neutrality over the regulatory period and, as a consequence, the adjusted tilted annuity results in charges that, after discounting, recover the asset's purchase price and financing costs.

1413.3 we consider the risk of technical obsolescence does not provide a reason for selecting one depreciation method over another.

Industry responses to our proposed approach in our December 2014 draft determination

1414. In response to our December 2014 draft determination paper, CEG for Chorus, submitted on specific aspects of our approach to depreciation.

1415. CEG's submission noted the attributes of the tilted annuity and assumed the use of the tilted annuity in its submissions on price trends and asset lives. CEG did not propose an alternative approach to depreciation.[784] We agree with CEG's statement that the tilted annuity approach:

- recovers the cost of the asset in present value terms over its expected life;
- changes in line with expected changes in an asset's replacement cost; and
- predicts a smooth path of revenue over time and therefore avoids price shocks when demand is stable.[785]

1416. CEG submitted that a shortcoming of straight-line depreciation is that, when it is used in conjunction with a return on capital factor, it can result in compensation that is "front loaded" and experiences an "upward jump" when the asset is replaced. CEG stated that the tilted annuity approach tends to result in smoother compensation (subject to a constant price trends).[786]

1417. We agree with CEG that that the relatively smoother compensation profile offered

783 Analysys Mason "Report for Chorus - Response to Commission consultation on regulatory framework and modelling approach for UCLL and UBA" 6 August 2014, paragraph [1.18].

784 For example, CEG "Evidence on price trends" 23 February 2015, para 30 and 36 which discuss price trends are written in the context of applying the tilted annuity approach.

785 CEG "Evidence on price trends" 23 February 2015, paragraph [14].

786 Ibid, at paragraph [18].

by the tilted annuity approach is a reason to use it rather than straight-line depreciation, when calculating forward-looking costs.

1418. CEG raised several issues about the price trends used in the tilted annuity formula when calculating deprecation.[787] CEG submitted these issues in the context of how the price trend component of the tilted annuity approach is calculated, and not in the context of proposing for an alternative approach to depreciation. Attachment I responds to CEG's concerns and explains that some of the concerns may have arisen from a misunderstanding of our approach to price trends.

1419. Several other parties submitted on the choice of asset lives and price trends used in the tilted annuity and these points are considered in Attachments H and I respectively.

[787] For example, CEG "Evidence on price trends" 23 February 2015, paragraphs [10], [19], [29-35].

Attachment H: Setting asset lives

Purpose

1420. This Attachment sets out our approach to determining the asset lives used in our TSLRIC model.

Our further draft decision

1421. Our further draft decision is to use Chorus's asset lifetimes and adjusted, if required, based on international benchmarks, to depreciate the hypothetical efficient operator's assets over their economic lives. The main reasons for this are:

1421.1 we consider that the accounting asset lives provided by Chorus are an appropriate starting point for the asset lives in our TSLRIC model, and provide a reasonable estimation of the economic lives of the relevant assets of the hypothetical efficient operator;[788] and

1421.2 TERA has cross-checked these asset lives against TSLRIC models overseas and adjusted the Chorus asset lives that were considered to be out of line with what has been observed in other relevant jurisdictions, or if no data was provided. We have reviewed TERA's analysis and agree with the conclusions.[789]

1422. We also recognise the risks of asset stranding due to technological change, and whether this risk is adequately reflected in the asset lifetimes in our model. This is further discussed in Attachment F.

Our December 2014 draft decision, submissions and cross submissions

1423. In our December 2014 UCLL draft determination paper, we used asset lifetimes provided by Chorus as an appropriate starting point, and where the asset lifetimes seemed out of line with what has been observed in other jurisdictions, we used international benchmarks derived from TSLRIC models overseas.[790]

1424. In response to our December 2014 UCLL draft determination paper, WIK submitted that the asset lives are lower in international benchmarks.[791] The comparisons

[788] Chorus provided a list of asset categories and its estimation of the corresponding lives, as required by our section 98 Notice. TERA has allocated all of the assets in the model into one of these categories and used the corresponding lives as the starting point. We have reviewed TERA's analysis and agree with the conclusions.

[789] These assets include MDF/ODF and submarine links, and are further discussed in this Attachment.

[790] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraphs [306-309] and Attachment F and Attachment G.

[791] WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [78].

provided by WIK are shown in Table 13 below. Based on this analysis, WIK argued that the asset lifetimes used in our draft TSLRIC model are too short.[792]

1425. Analysys Mason indicated in its cross submission that although WIK submitted those asset lifetimes for certain assets, practice is different.[793] The comparisons provided by Analysis Mason are shown in Table 13 below.

1426. Chorus responded to WIK's submission that we need to consider international comparisons. Chorus submitted that there is nothing in international comparisons to suggest that economic lives for Chorus are inappropriate.[794] The comparisons provided by Chorus are also shown in Table 13 below.

Table 13: Summary of asset lifetimes in our TSLRIC model and asset lifetimes raised in submissions to our December 2014 draft determination (years)

	Economic lifetime used in our TSLRIC model	WIK	Analysys Mason	Denmark provided by Chorus	Sweden provided by Chorus
Overhead copper	14	20			
Copper cable	20	25-40	20 (Australia)	30/35	
Fibre cable	20	25-40	20 (Australia)	30/35	20
Duct	50	50	35 (Australia)	30/35	40
Poles	20	20			
Urban/Rural manhole	50				
Street cabinet	14	20	15 (Switzerland and Belgium)		
MDF/ODF	20	50	Support 20	15	15
FWA base station	14			20	10

Source: Draft TSLRIC model and submissions to the December 2014 UCLL draft determination paper
Note: the international comparisons in this table were provided by interested parties and were not selected by the Commission

792 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [356].

793 Analysys Mason "report for Chorus - UCLL and UBA FPP draft determination cross submission" CONFIDENTIAL, 20 March 2015, Section [2.9.1].

794 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [338] and Figure 12.

1427. This table suggests that:

1427.1 the international comparisons show that most economic lives in our model are in line with international comparisons;

1427.2 the international comparisons show that the asset lifetime used for cables is lower than the Danish international benchmark. It should be noted, that the relatively high lifetime of cables in the Danish model is a result of the regulator's recent revision of the model. Previously, the lifetime of cables was set at 20 years;[795]

1427.3 the international comparisons seem to suggest shorter asset lifetimes for ducts, rather than a longer asset lifetime as submitted by WIK. [796] We consider that it is appropriate to use direct evidence of asset lifetimes of ducts in New Zealand because it reflects operating conditions that network operators encounter in New Zealand.

1428. Given this comparison:

1428.1 we agree with Chorus and Analysys Mason that the economic lifetimes used in our TSLRIC model are in line with international comparisons provided by Chorus and Analysys Mason;[797]

1428.2 we disagree with WIK that the asset lifetimes are lower in international benchmarks compared to the economic lifetimes used in our TSLRIC model.

1429. WIK also submitted that the assumption of an economic lifetime for ducts at 50 years is out of sync with the assumption of fibre and copper cables of 20 years. We

795 The Danish regulator (DBA) found that there are several new technological developments on the copper platform in Denmark that give rise to the economic lifetime of copper cables being prolonged (pair bonding, phantom, G-fast, etc.). DBA still believes that the economic lifetime for PDP to end-user could be 35 years. For PDP-CO, the lifetime should be lower than 35 years but above 20 years. Lastly, DBA notes that the model dimensions the number of cables in the network (both copper, fibre and coax) based on the number of premises passed and not the number of active customers (only deployment of drop wires are dimensioned based on active customers). Therefore, when a customer switches away from the LRAIC modelled network, eg, to mobile or alternative fixed infrastructure, total network costs are not affected significantly. This means that TDC is still getting the same costs recovered (excluding the cost of the drop wire) even though fewer customers are active. In this light, DBA believes that it is justified that the economic lifetime of the cables has been extended.

796 Chorus submitted in its cross submission that we should prefer direct evidence of asset lives in New Zealand. Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [339].

797 We note that these international benchmarks are consistent with other international benchmarks used in this determination.

disagree with WIK.[798] Our view is that ducts and fibre and copper cables are different assets, and that ducts may have multiple cables placed in it over its asset lifetime.

Analysis on asset lifetimes for this further draft determination

Our framework for assessing asset lives in the UCLL pricing review determination

1430. Using asset lives that understate the economic lives for assets such as civil engineering assets (ie, ducts and trenches) would result in the hypothetical efficient operator being over-compensated, as we are modelling the deployment of new assets rather than re-using existing assets. Ingo Vogelsang has also noted that, when using new assets (rather than re-using assets), it is important that the assumed asset lives are sufficiently long.[799]

1431. Conversely, using asset lives that overstate the economic lives would result in the hypothetical efficient operator being under-compensated.

1432. In regards to considering the asset lives of the hypothetical efficient operator, WIK submitted that we should not adopt Chorus' assets lives as this involved consideration of the incumbent, and not the hypothetical efficient operator.[800]

1433. Chorus stated in its submission that asset stranding and financial statements have a different required task in considering the extent of asset lives of the hypothetical efficient operator. Chorus' assets are old, while the assets of hypothetical efficient operator are all new.[801]

1434. Yet, in its cross submission, Chorus stated that WIK's argument is overly simplistic. Chorus stated that:[802]

> It would be prudent (and efficient) for any HEO to consider the incumbent's experience. In addition, Chorus' asset lives are developed following thorough analysis by subject matter experts, which take account of the experience of New Zealand conditions. Asset life review occurs annually, including a detailed review by subject matters experts, in conjunction with audit advice on accounting standards. There is no reason that an efficient HEO would not undertake an equivalent analysis, and reach equivalent conclusions.

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798 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [78].

799 Ingo Vogelsang "Current academic thinking about how best to implement TSLRIC in pricing telecommunications network services and the implications for pricing UCLL in New Zealand" 25 November 2014, paragraph [23].

800 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [78], [100-101], [356].

801 Chorus "Submission for Chorus in response to Draft Ricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [282].

802 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [335].

1435. We agree with Chorus' cross submission. The consideration of the characteristic of an incumbent's asset lifetimes is a relevant consideration. The hypothetical efficient operator is a hypothetical, so we cannot observe its asset lifetimes, but we can observe an incumbent's asset lifetimes.

We have used Chorus data on assets lifetimes

1436. As explained in Chapter 1 of this further draft determination, real world information, and indeed that reflecting the legacy decisions of the incumbent, may be used to inform our assessment of what constraints a hypothetical efficient operator would be likely to face and decisions it would likely to make.

1437. As explained above, we considered to be appropriate to use information provided by Chorus to assess the most reasonable values for asset lives as a starting point. Chorus explained that its asset lifetimes are calculated as follows:[803]

> Chorus reviews the useful life of assets annually, assessing the expected period of service, and the likelihood of the asset becoming obsolete as a result of technology advances.

1438. TERA then cross-checked these asset lives against TSLRIC models overseas. TERA used Denmark, Ireland and other countries (for which the data remains confidential) to compare Chorus's asset lifetimes provided to the Commission. The reason for selecting these countries is more a pragmatic reason in that the information is well document and transparent. We note that the countries are consistent with our international benchmark analysis in Attachment Q – International comparators.

1439. TERA found that asset lifetimes for submarine cables were not provided by Chorus. Therefore, international benchmarks have been used to set the asset lifetime for submarine cables:

1439.1 In Ireland, ComReg uses lifetimes for submarine cables of 15 years;[804]

1439.2 In Denmark, DBA uses lifetimes for submarine cables of 40 years.

1440. Based on TERA's analysis (with which we agree), and considering lifetimes for cables in New Zealand, our decision is to select an intermediate value of 20 years.

1441. With respect to MDF/ODF, Chorus provided lifetimes of [ ]**CNZCI** years which is significantly lower than benchmark data collected by TERA Consultants:

1441.1 From Denmark: 20 years;

1441.2 From Ireland: 40 years; and

1441.3 Similar results were found for other countries (for which the data are confidential).

[803] Chorus "Commission's follow up questions following FPP conference" Confidential, 12 May 2015, Question 3.

[804] ComReg Response to Consultation Document No. 09/11: Review of the regulatory asset lives of Eircom Limited, 11 August 2009

1442. We have reviewed TERA's analysis and we agree with the conclusions. We cannot see a strong reason for having asset lifetimes for MDF/ODF in New Zealand that are [ ]**CNZCI** of those in other countries. Accordingly, our further draft decision is to select a value of 20 years for the asset lifetime for MDF/ODF.

1443. To further consider whether Chorus' asset lifetimes are appropriate and reflecting operating conditions that network operators would encounter, we have obtained some evidence on the likely physical/engineering lifetimes of the asset classes submitters raised as a concern,[805] and the asset lifetimes used in the TSO model,[806] and the asset lifetimes used to set tax depreciation rates determined by IRD as a national benchmark.[807] We consider that the asset lifetimes provided by IRD are independent and objective.

1444. Table 14 below shows the economic lifetimes used in our TSLRIC model and the additional information we have obtained on asset lifetimes in New Zealand.

Table 14: Summary of asset lifetimes in our TSLRIC model and asset lifetimes raised in submissions to our December 2014 draft determination (years)

	Economic lifetime used in our TSLRIC model	Engineering lifetimes	TSO	IRD (used for tax depreciation rates)
Overhead copper	14	100	**CCNZRI**[ ]	15.50
Copper cable	20	100	**CCNZRI[**]	
Fibre cable	20	100	**CCNZRI[**]	15.50
Duct	50	100	**CCNZRI**[ ]	50
Poles	20	50	**CCNZRI[**]	25
Urban/Rural manhole	50	50	**CCNZRI[**]	50
Street cabinet	14	20-50		
MDF/ODF	20	30-50		12.50

1445. The comparison in the table suggests that:

805 We could not obtain data on all engineering lifetimes for all asset classes, and for some asset classes we only obtained a likely range of the engineering lifetime.

806 Commerce Commission "Final Determination for TSO Instrument for Local Residential Telephone Service for period between 1 July 2004 and 30 June 2005", Table 10, p. 99.

807 IRD document at http://www.ird.govt.nz/resources/6/5/6576ff004ba3cf748844bd9ef8e4b077/ir265.pdf, p. 40-41.

1445.1 The economic lifetimes are in the same range as other national benchmarks. The only difference is the TSO asset lifetimes for manholes and the IRD asset lifetimes for MDF/ODF. Both the differences indicate that the economic lifetimes used in our model are longer than the national benchmarks. This counters WIK's submission that our asset lifetimes used in the TSLRIC model are too short.

1445.2 The economic lifetimes for many asset classes are substantially lower than the engineering lifetimes, suggesting that the possibility of asset stranding has likely been taken into account to a material extent. This is further considered in Attachment F – Asymmetric risk.

1445.3 Based on the analysis in this Attachment, there is nothing to suggest that the proposed asset lifetimes are overly long or short. As such, we consider that they are within a reasonable range for economic lifetimes of the relevant assets for the UCLL service.

Attachment I: Price trends

Purpose

1446. This Attachment explains how we forecast price trends for active assets, passive assets, and opex, as well as how we convert foreign currency to New Zealand dollars. These price trends are used in our TSLRIC model to forecasts costs, and applied with tilted annuity depreciation.

1447. We commissioned NZIER to provide advice on long-term prices for this FPP pricing review.[808] This report is published with our further draft determination.

Our further draft decision

1448. Our further draft decision is as follows:

1448.1 For active assets using international benchmarks. Our further draft decision is to include the Australian benchmark to determine price trends for active assets. We recognise that the Australian data is five years old. However, including Australia in the benchmark set provides a more representative benchmark set for New Zealand. If we were to exclude Australia, the benchmark set will only contain European countries.[809]

1448.2 For passive assets using a cost escalation approach. The cost escalation approach can be summarised as follows:

1448.2.1 We have selected the most relevant raw indexes and derived the long-term trend for each raw index.

1448.2.2 The long-term price trend is then determined for each asset category based on a combination of the raw indexes and the composition of that asset category. For example, fibre optic cost consists of 70% of fibre cable cost and 30% labour costs. Given this, the price trend for fibre optic is equal to 30% x trend for the labour cost index, plus 70% x the trend for the fibre optic cable index.

1448.3 For passive assets, our further draft decision has changed from using compound average growth rates to using the average of annual growth rates to determine long-term price trends. The average annual growth rates are based on co-integrated relationships if the series has a stochastic trend. Our further draft decision is also to use the following price indexes and approaches to determine the long-term price trend for the following cost drivers when determining price trends.

[808] NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission, May 2015).

[809] In the IPP benchmarking exercise, our benchmark set mostly comprised European countries and was based on comparability. In a TSLRIC modelling exercise we consider it would be appropriate to include Australian data in the benchmark set to determine prices trends for active assets.

Table 15: Price indexes and approaches to determine long-term price trends

Cost driver	Our further draft decision: Appropriate price index	Basis of price trend
Building costs	Capital Goods Price Index (CGPI) for non-residential buildings	Relationship to general inflation (1.9%)
CPI	Consumer price index (CPI)	Current requirements of the RBNZ's policy target agreement with the Minister of Finance (2%)
Wages/labour	Labour cost index (LCI) -all industries	Relationship to general inflation (2%)
Fabricated steel	A Statistics New Zealand Producer Price Index for Outputs of the metal fabrication industry (PPI-O)	Relationship to international steel prices, aluminium prices and domestic labour costs (2.9%)
Copper	London Metals Exchange (LME) prices for Copper	Average of historical growth and forecast based on LME futures plus Consensus Economics consensus forecasts (5%)
Fibre optic cabling	A US Bureau of Labour Statistics Producer Price Index (US PPI) for wholesale prices of Fibre Optic Cable	Historical trend including currency effects (-1.3%)

Source: Commerce Commission's own summary based on information provided by NZIER

1448.4 Our further draft decision is to use the CPI as the default price index for other inputs where no data is available. Our further draft decision is also to use the LCI for labour-related opex and for non-labour-related opex we use a stable price trend, ie, a price trend of 0%.

1448.5 In relation to labour-related opex, our further draft decision is also not to allow for an additional adjustment for productive efficiency gains for opex related labour at this stage. The reason is that there is no convincing evidence to show what the adjustment for productivity efficiency should be, and we note that productivity efficiency gains could be greater or smaller than the productive efficiency gains already included in the LCI for all industries.

1448.6 To convert foreign currency to New Zealand dollars, our further draft decision is to use the blended approach to convert foreign currency to New Zealand dollars. This approach was used in previous determinations for UCLL, UBA and SLU. This implies that if a series relating to tradable capital goods inputs only, we will use market exchange rates. For series with non-tradable components only, such as labour, we will use purchasing power parity (PPP) rates only, and where we have a series related to both tradable capital goods inputs and non-tradable components, we will use an appropriate weighting between a PPP rate and a market exchange rate.

What we said in the December 2014 UCLL draft determination paper

1449. In our December 2014 UCLL draft determination paper, we used the following approaches for estimating price trends for different asset and opex categories, and converting foreign currency to New Zealand dollars.[810]

1450. For active assets we used average price trends based on international benchmarks. International benchmarks included were Australia, Denmark, Sweden, France and Norway.

1451. For passive assets we used a cost escalation approach using appropriate price indexes. In particular, we determined the long-term price trend for:

1451.1 building costs based on the number of dwellings;

1451.2 miscellaneous material parts based on the CPI;

1451.3 installation parts of assets based on the LCI;

1451.4 material part of ODF/MDF based on an independent fabricated steel;

1451.5 copper part of the copper cable material costs based on a copper index;

1451.6 material part of optical fibre cables based on a fibre optic cabling index;

1451.7 we used CPI as the default price index for other inputs.

1452. For opex, we used a different approach depending on whether the opex is labour or non-labour related.

1452.1 For labour-related opex we used a cost escalation approach using the LCI.

1452.2 For non-labour related opex, we used a stable price trend, ie, a price trend of 0%. The reason for this was that we expect efficiencies are likely to offset general inflation.

1453. We also converted foreign currency to New Zealand dollars using a PPP rate. We used a constant rate for PPP over the regulatory period.

Issues raised in submissions on our December 2014 UCLL draft determination paper, and our response to submissions

1454. This Attachment now considers the submissions received on our December 2014 UCLL draft determination paper with regard to our approach to determine the long-term price trends for active and passive assets, opex and currency conversion.

810 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [310-313] and Attachment H.

Converting foreign exchange rates to New Zealand dollars

1455. In the December 2014 UCLL draft determination paper, we converted foreign currency to New Zealand dollars using PPP rates, with 2013 being held constant for the regulatory period.

1456. Network Strategies agreed with the PPP rates, and indicated endorsement of the use of PPP rates instead of the "blended" rates that incorporate both the PPP and the market exchange rates that have previously been used by us.[811]

1457. CEG submitted we should not use PPP but only market exchange rates as steel and copper is an international market.[812] Network Strategies, in its cross submission, stated that the use of market exchange rates are preferable to use rather than blended exchange rates.[813]

1458. We usually apply a blended currency conversion approach to convert prices for the purpose of setting prices in telecommunications. This approach converts benchmark prices based on an appropriate weighting of PPP and a ten year average for market exchange rates. We applied this approach for all the determinations for SLU, UCLL, and UBA.[814]

1459. The blended approach in previous determinations reflected the fact that these services comprised of approximately 50% of non-tradable components (such as labour) with the other 50% relating to tradable capital goods inputs. We use the exchange rates as a reference point for tradable goods and services, PPP rates as reference point for non-tradable components.

1460. We propose to use the same approach to convert foreign exchange rates to New Zealand dollars for this pricing review. This implies that:

1460.1 for price series relating to tradable capital inputs only, we will use market exchange rates;

1460.2 for price series with non-tradable components only, such as labour, we will use PPP rates only; and

1460.3 for price series relating to both tradable capital inputs and non-tradable components, we will use the blended approach.

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811 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, section 6.3.

812 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [55-62].

813 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 44-45. Network Strategies submitted that it is important to use a consistent series. Network Strategies explained that CEG used historical information from the Reserve Bank and then Bloomberg for the future. This introduces additional error and different trends in different data sources.

814 See, for example, Commerce Commission "Unbundled Bitstream Access Service Price Review, Decision [2013] Final determination to amend the price payable for the regulated service Chorus' unbundled bitstream access made under s 30R of the Telecommunications Act 2001" 5 November 2013, NZCC 20, Attachment E.

1461. For example, for copper and fabricated steel we will only use market exchange rates to convert foreign currencies to New Zealand dollars, whereas in the case of MDF and ODF unit costs we will use a blended approach because it includes both tradable capital inputs and non-tradable components, such as installation costs.

Price trends should be constant, and over the lifetime of the asset

1462. CEG submitted that forward-looking prices must achieve NPV neutrality over the life of current investments. When coupled with tilted annuity from depreciation that assumes constant annual change in costs, price trends must be based on expected changes beyond the regulatory period.[815] In its cross submission, Network Strategies agreed with CEG that the price trend represent that price trend of the lifetime of the assets, not the regulatory period.[816]

1463. We agree. We aim at assessing the long-term price trends using the longest available data series. Our view is that CEG and Network Strategies misinterpreted our aim to assess how the cost might change over the regulatory period. Our intention was not to calculate short term price trends, but rather to set long-term price trends over the lifetime of the asset.

1464. CEG indicated that the modelled price trend must be constant over time.[817] In its cross submission, Network Strategies agreed with CEG that price trends must be constant over the asset's lifetime.[818] We agree because a tilted annuity will result in a relatively constant rate of change in prices in a situation where relatively stable demand profile is modelled.

Price trends can be based on historical data, forecasts or a combination of historical data and forecasts to determine the long-term price trend

1465. Network Strategies submitted that price trends must be forward-looking; past trends may not be appropriate to project forward-looking trends.[819] Contrary to Network Strategies' view that forecasts for the regulatory period be used, Chorus supports the use of long-term forecasts and historical information.[820]

815 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [3-6]; and [30-36], and [67]; Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [328].

816 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, p. 51.

817 Ibid, at paragraph [20-29].

818 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 41-42.

819 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, p. 41-42.

820 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [327-328].

1466. Vodafone, in its cross submission, argued that CEG placed too much emphasis on historic data, and long-term historical price trends may not be appropriate when considering future price trends for short-lived assets.[821]

1467. We consider that a combination of both past and future trends provides the most robust indication of forward-looking trends for our TSLRIC model. We recognise that past trends could also be used as a proxy for long-term trends unless any material change in the future trend can be anticipated. In the latter case future trends should be used. For example, if there was a structural break in historical data, future trends may be more appropriate.

Long-term price trend for active assets

1468. We determined the long-term price trend based on international benchmarks for active equipment in our TSLRIC model. International benchmarks included are Australia, Denmark, Sweden, France and Norway.

1469. Network Strategies criticised the inclusion of Australian data as the data used is over 5 years old and historic and should be omitted.[822,823] CEG, in its cross submission, disagreed with Network Strategies recommendation to exclude Australia.[824]

1470. Our further draft decision is to include the Australian benchmark because it provides a representative benchmark set to determine the price trends for active assets in New Zealand. If we were to exclude Australia, only European countries remains in the benchmark set.[825] The inclusion of the Australian benchmark will have an impact on the long-term price trend for FWA base stations and DWDM links (active part).

1471. Network Strategies further submitted that we should rather use a median than an average to reduce the impact of extreme values. We agree with Network Strategies that it is more appropriate to determine the median instead of averages to estimate the price trend for active assets. This is also consistent with our approach in previous determinations, where we used the median in our calculations. We note that the use of a median instead of an average has no material impact.

Approach we use to estimate long-term price trends for passive equipment

1472. We used a cost escalation approach to determine the price trend for passive equipment in the December 2014 UCLL draft determination paper. The cost escalation approach can be summarised as follows:

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821 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, section E.2.4.

822 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, section 6.1.

823 Ibid.

824 CEG "Issues from submissions UCLL and UBA" March 2015, paragraph [68].

825 In the IPP benchmarking exercise, our benchmark set mostly comprised European countries and was based on comparability. In a TSLRIC modelling exercise we consider it would be appropriate to include Australian data in the benchmark set to determine prices trends for active assets.

1472.1 We have selected the most relevant raw indexes and derived the long-term trend for each raw index.

1472.2 The long-term price trend is then determined for each asset category based on a combination of the raw indexes and the composition of that asset category. For example, fibre optic cost consists of 70% of fibre cable cost and 30% labour costs. Given this, the price trend for fibre optic is equal to 30% x trend for the labour cost index, plus 70% x the trend for the fibre optic cable index.

1473. CEG submitted that TERA used averages rather than long-term price trends.[826] CEG also submitted that TERA has not used forecasts, and only historic information.[827]

1474. Network Strategies submitted that TERA does not use price indexes but the compound average growth rate (CAGR) for 2013 and 2014, and as a result this is based on historic cost. Network Strategies indicated that our preferred approach provided in the draft determinations was to use forecasts.[828] Network Strategies proposed that forecasts should be used to assess price trends instead of historic trends.[829]

1475. We agree with submissions that the long-term price trends should include forecasts, where appropriate. We also agree with submissions that it is not appropriate to calculate long-term price trends based on CAGR, in particular if price series have stochastic trends. In this regard, NZIER also recommended that we should avoid using compound growth rates because it induces large amounts of variability and imprecision.[830]

1476. In the alternative, CEG proposed using a regression model where the log of the price is assumed to be linear.[831] CEG also submitted that estimating the price trend using a linear regression (based on all years) rather than a geometric mean based on the first and last point is likely to be more precise.[832] In its cross submission, Vodafone and Network Strategies, commented on CEG's proposed approach would have a reasonable fit for well-behaved data series that exhibit a relatively consistent trend. However, for more volatile data series – such as that for copper prices – even if the overall fit is good, the model may be a poor predictor of forward-looking prices over the medium term.[833]

826 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [3-6].
827 Ibid.
828 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, section 6.2.
829 Ibid.
830 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission, May 2015), p. 7.
831 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [42-43].
832 Ibid, at paragraph [39-43].
833 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 42.

1477. In response to CEG's proposed linear regression approach, we found that none of the data series we are considering can be reliably considered to have a linear deterministic trend. It is for this reason that we do not use trend calculation method proposed by CEG. Despite not adopting the precise method, we agree with the CEG submission's general point that trend calculations should use multiple data points.

1478. In this regard, NZIER recommended that the most robust approach is one of the following approaches, depending on the data and information available:

1478.1 Qualitative judgement based on policy targets.

1478.1.1 In this context we note that price stability is mandated by government policy. For example, the Reserve Bank is asked to hit a target of the rate of price growth. Given this, we can form a reasonable well-informed view of general inflation as measure by CPI.

1478.2 Trends modelled using benchmark prices, to deal with stochastic trends. Most of the series we consider have stochastic trends.

1478.2.1 So, if a stochastic trend is present, we test whether relationships with other series produce a stable relationship through time. We then use that stable relationship, if any, to infer the underlying long-term trend.

1478.2.2 For example, if series has a stable relationship to CPI, we can then overcome the problem of understanding stochastic trends by focussing on the relationship between the changes in CPI and the series under consideration.

1478.3 Arithmetic averages of annual average percentage growth rates.

1478.3.1 Trends are calculated based on annual average growth rates. This ensures that the growth rates are less affected by volatility.

1478.3.2 Arithmetic averages of annual average percentage growth rates are also an *unbiased* estimate of the trend in a random walk.

1479. We consider the proposed approaches recommended by NZIER are appropriate and robust because the series under consideration have stochastic trends in most instances. We note that the choice in the approach to use is based on our judgement about which approach will have the least error and potential for statistical bias for the series under consideration.

1480. We will now turn to the determination of long-term price trend for the relevant raw indexes.

Long-term price trend based on CPI

1481. In the December 2014 UCLL draft determination paper, we used NZIER's forecasts for CPI, and TERA calculated a price trend for the period 1994 to 2014 at 2.18%.

1482. CEG submitted that the CPI should be decreased to be consistent with the Reserve Bank inflation target.[834] Vodafone and Network Strategies submitted that they agree with CEG that a reduction in the CPI is warranted because more recent data supports a reduction rather than a reason based on the mid-point for target inflation. A 2% inflation rate would be appropriate.[835,836]

1483. NZIER recommended that a 2% trend for CPI is appropriate because it is consistent with the Reserve Bank's inflation target. In particular the Reserve Bank's inflation target and with the current Policy Targets Agreement (PTA) between the Minister of Finance and the Reserve Bank of New Zealand (RBNZ) Governor:[837]

> b) For the purpose of this agreement, the policy target shall be to keep future CPI inflation outcomes between 1 per cent and 3 per cent on average over the medium term, **with a focus on keeping future average inflation near the 2 per cent target midpoint**.
> [Emphasis added]

1484. We agree with the submissions and NZIER's recommendation that a reduction in the CPI trend is warranted. Our further draft decision is to use a price trend of 2%, and the reason is based on the inflation target set by the Reserve Bank, given that the future average inflation is targeted near the midpoint and any forward-looking view on CPI would need to consider potential policy changes in the future.

Long-term price trend for building costs

1485. In the December 2014 UCLL draft determination paper, TERA estimated the trend for building costs based on the number of dwellings in New Zealand for the period 2006 to 2014 at 1.90%.

1486. CEG submitted that the price trends model wrongly uses the trend in the number of buildings as a proxy for buildings price trends.[838] CEG submitted that the price trend for building costs should be based on Statistic New Zealand CGPI for non-residential buildings, from 1989 to March 2020, resulting in a price trend of 2.33%.[839]

1487. NZIER recommended that the most appropriate price index for building costs is the series proposed by CEG, ie, the Statistics New Zealand CGPI for non-residential buildings because it includes the costs of acquiring building assets such as exchange equipment.

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834 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [47-50]; We noted that CEG provided two contradictory views in its submissions, 2% noted in the Executive summary and 2.22% at Section 3 of its submission. We take it that CEG submitted that CPI should be 2%, and is based on the mid-point of target inflation set by the Reserve Bank.

835 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 48-50.

836 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, section E.2.10.

837 The current agreement, signed in 2012, is available at: http://www.rbnz.govt.nz/monetary_policy/policy_targets_agreement/.

838 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [46].

839 Ibid, at paragraphs [46] and [92].

1488. We agree with NZIER’s recommendation because it includes the appropriate construction costs and excludes maintenance costs. This series is also based on the price of buildings rather than the number of dwellings, previously used in our determination.

1489. NZIER recommended that the most robust long-term price trend is estimated based on the stable relationship with CPI. The CGPI for non-residential buildings has a stochastic trend and it was confirmed that it has a stable relationship with CPI. Given this relationship, NZIER estimated that the implied underlying trend for building costs at 1.9%.

1490. We agree with NZIER’s recommendation. We consider that the historic growth rate from 1992 to 2014 was 1.9%, and there is no evidence to suggest that this growth rate is not a reasonable proxy for a long-term price trend for building costs.

1491. Given that our further draft decision is no change to the price trend used in the previous determination, although based on a different index, it has no impact on the model.

Long-term price trend for wages/labour

1492. We used the LCI for all industries, and TERA estimated a price trend from 1994 to 2014 at 2.58%.

1493. Chorus and CEG submitted that we should use the labour index for technicians and associates because this index better reflects labour for purposes of our pricing review determinations, and this is the index used by Chorus in its contract terms.[840] CEG estimated the price trend from December 1992 to March 2019 at 2.20%.

1494. Vodafone and Network Strategies submitted that it is questionable whether CEG’s data is of sufficient quality. The LCI for technicians and associates is associated with a break in the initial price series, and CEG’s projection for this industry specific LCI is based on projections for the LCI all industries.[841,842] Network Strategies submitted that we should use the LCI for all industries, and estimated the price trend from 2014 to 2019 at 2.20%.

1495. NZIER recommended that we use the LCI for all salary and wage rates for all industries. The reason is that opex labour extends beyond field technicians and includes customer services, finance, human resources, and property management personnel and labour-related costs. In addition, current commercial agreements should not be an important factor in understanding price or cost trends.

840 Ibid, at paragraph [51-54].
841 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 43.
842 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, section E.2.6.

1496. We agree with NZIER that the LCI for all industries is the most appropriate index for labour. The reason is that the labour considered in our TSLRIC model for the hypothetical efficient operator extends beyond the labour included in the labour index for technicians and associates.

1497. NZIER recommended that the most robust long-term price trend is estimated based on the stable relationship with CPI. The LCI for all industries has a stochastic trend and it was confirmed that it has a stable relationship with CPI. Given this relationship, NZIER estimated the implied underlying trend for labour costs at 1.9%. NZIER proposed that the LCI trend equal the expected trend in CPI. This is consistent with the trend including forecasts to 2020. Accordingly, the trend for LCI is 2%.

1498. We agree with NZIER to set the price trend at 2% because we would not expect that LCI grows more slowly than the CPI.

Efficiency gains the long-term trend for labour-related opex

1499. To forecast opex for 2015 and the subsequent years, we used a cost escalation approach for labour related opex in our December 2014 UCLL draft determination paper.[843] Our draft decision was to inflate the labour related opex of the base year by using only the LCI rather than a disaggregated index approach because the labour costs dominate that part of the opex.

1500. WIK submitted that we need to assume that the hypothetical efficient operator also materialises opex related efficiency gains, and stated:[844]

> We are, however, not convinced that it should be impossible to achieve efficiency and productivity gains in New Zealand over a five year period. Telecommunications operators steadily realise productivity gains in their operations. These productivity improvements are to a relevant degree embedded in the capital asset structure, but they are also related to the use of labour in the production process. Operators and RSPs usually also run specific labour efficiency improvement programmes to reduce labour costs. Process-related costs are therefore also subject to efficiency improvements. It is for this reason that other regulators require significant efficiency improvements for transaction services which are mainly driven by operating expenses.

1501. WIK further submitted that the productive efficiency gains should not be lower than 5%. WIK provided two international examples in this context:[845]

> For example, the British regulatory authority, Ofcom, estimates forward-looking costs for monthly rental fees and transaction fees with a top-down approach by extrapolating costs of BT's regulatory accounts. Ofcom applies an efficiency factor to the cash expenditure in this model (OPEX and CAPEX). For the latest assessment, a base case net efficiency rate of 5% per year was applied to both, OPEX and CAPEX. As this estimation is primarily based

843 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [776f].

844 Wik-Consult "Submission in response to the Commerce Commission's "Draft pricing review determination for Chorus' unbundled bitstream access service" and "Draft pricing review determination for Chorus' unbundled copper local loop service"", 20 February 2015, paragraph [150].

845 Wik-Consult "Submission in response to the Commerce Commission's "Draft pricing review determination for Chorus' unbundled bitstream access service" and "Draft pricing review determination for Chorus' unbundled copper local loop service"" 20 February 2015, paragraph [151-152].

> on the incumbent's (BT Open-reach) data of the past and of BT's own forecast, the efficiency rate of 5% per year represents in our view the lower limit of possible efficiency gains
>
> We can provide another example from the Danish cost model. The Danish regulatory authority uses an annual productivity gain factor to reduce OPEX. This factor is fixed at 2% per year.

1502. In its cross submission, Chorus argued that there is no adjustment to LCI required. The hypothetical efficient operator would be limited to process efficiencies. Wages will increase, and this will be neutralising productivity gains.[846]

1503. NZIER advised on this point that additional adjustment to the LCI trend should be considered, when calculating opex costs, if there is good evidence that providers of UCLL services achieved productivity gains which are larger than those achieved across the entire economy. NZIER also recommended that more detailed analysis would be required before a conclusion could be reached on the value of a productivity efficiency adjustment.

1504. We agree with the argument in principle to allow for an adjustment for productivity gains for opex-related labour. It is questionable, however, what the value for such an adjustment should be.

1505. Our approach to productivity gains in Part 4 varies from determination to determination. For example:

1505.1 In the recent Orion CPP decision, we used a LCI for a specific industry, with no additional adjustment for productivity because the series already included such an adjustment.[847]

1505.2 In the recent DPP determination, we have assumed a -0.25% annual change in operating expenditure partial productivity based on our expert judgement. Our view has been informed by historical changes in partial productivity for New Zealand. Historic opex partial productivity was estimated between -1.4% and -0.45% over 2004 to 2014. Our decision was then a judgement based on future expectations of productivity growth, evidence of productivity growth observed overseas, incentives created by a negative productive growth, and consideration of new regulation obligations as well as the potential incentives created by our decision.[848,849]

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846 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [207-210].

847 Commerce Commission "Setting the customised price-quality path for Orion New Zealand Limited" 29 November 2013, paragraph [N50-N51].

848 Commerce Commission "Default price-quality paths for electricity distributors from 1 April 2015 to 31 March 2020" 28 November 2014, paragraph [3.24-3.34] (DPP determination).

849 We note that the consideration in the DPP determination considered both labour and non-labour related opex.

1506. In the current determination, we considered the following options to inform such an adjustment:

1506.1 Use the difference between productivity gains for all industries and information media and telecommunications. NZIER indicated in its report that the Information Media and Telecommunications industry had faster productivity growth than other industries from 1992 to 2007.[850] We note that this productivity efficiency adjustment would be based on historic information and based on an industry much wider than UCLL services.

1506.2 We could use international benchmarks provided in the WIK submission. These benchmarks provide a range from 2% to 5%. However, it is questionable whether the benchmarks are appropriate in New Zealand context.

1506.3 We could assume that no additional change for productivity gains is required. NZIER noted that the LCI for all industries captures productivity efficiency gains of around 1.7% over 15 years, before adjustments for industry compositions.

1506.4 At the conference, we asked whether the labour cost index should be adjusted for productive efficiency gains in order to determine the long-term price trend for opex related labour, and what evidence could be provided to support that.[851] We then queried whether Chorus could provide information about such productivity gains, based on its 3 year plans. In its response to this question, Chorus indicated that:[852]

> Chorus' current Board approved 3 year plan (FY14/15) forecasts labour cost increases to 2017 of [ ].
>
> While Chorus has efficiency initiatives planned (eg, automation), this is offset by other factors such as new products and processes, salary adjustments and the level of product activity and maturity. For example, new low volume processes will not generally justify a business case for automation, so the processes will likely be manual in nature in the initial period on the product maturity cycle.
>
> As Chorus noted at conference:
>
>> it's possible that the labour cost index used by the Commission already captures a productivity element. At this stage, we haven't had the opportunity to investigate this further; and

850 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission, May 2015), Figure 6. The Information Media and Telecommunications industry had a productivity growth of 2.4% compared to all industries of 0.8%. Although, there does not seem to be a statistically significant difference between the two industries.

851 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 422.

852 Chorus "Commission's follow up questions following FPP conference" Confidential, 12 May 2015, Question 2.

the Commission has already made a 50% downwards adjustment to Chorus' opex, and a further adjustment isn't warranted.

We also note that efficiency initiatives, such as automation, inevitably involve capital expenditure over the regulatory period that would also need to be accounted for in the cost modelling.

1507. Our further draft decision is to adopt the third option, ie, no change for productivity efficiency gains for labour related opex. The reason is that there is no definitive evidence to show what the adjustment for productivity efficiency should be for UCLL services, and it could be greater or smaller than the productive efficiency gains already included in the LCI for all industries.

Long-term price trend for fabricated steel

1508. In the December 2014 UCLL draft determination paper, we used international steel prices to estimate the price trend for fabricated steel from 1995 to 2014 at 1.43%.

1509. Chorus submitted that we should use forecasts for steel rather than historic information.[853] CEG proposed that we use the MEPS Asian steel series, and estimates the price trend from 1997 to 2022 at 1.76%.[854]

1510. Network Strategies submitted that we should use forecasts and use historic information as a cross-check. Network Strategies submitted that the price trend for steel should be 1.44%.[855] In its cross submission, Network Strategies indicated that the projections of steel used by CEG are not fully compatible with the historical data, and the two parts of the conjoined series may have differing (although probably related) trends.[856]

1511. Our view is that it is unclear why CEG's proposed index is better than the current index used in the model. We asked NZIER to consider this and provide a recommendation on the most appropriate index to use for steel in the context of the New Zealand market and our TSLRIC modelling exercise.

1512. NZIER recommended that we use the Producer Price Index for the Outputs of fabricated Metal Product Manufacturing industry (PPI-O). This index measures the factory door cost of the outputs for the industries included in this index.

1513. NZIER estimated the long-term price trend at 2.9% based on the co-integrating relationship between PPI-O and a combination of LCI, international steel prices in

[853] Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [308].

[854] CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [55-58].

[855] Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, Section 6.2.

[856] Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 44.

New Zealand dollars and aluminium prices in New Zealand dollars.[857,858] This trend includes both historical relationships and expected future prices for international metal prices.

1514. If the trend was only based on forward-looking prices, the implied long-term price trend is 1.7%. NZIER prefers to include historic data in the long-term price trend because:[859]

> The reason we include history plus expectations for metal prices is because our forecast average growth rates for steel are heavily influenced by a correction in steel prices in the current year and into 2016. This 33% change is a very large fluctuation and if we did not adjust for it our projection would be dominated, in effect by only two observations. One way to remove this effect but to do so using actual data is to take an average growth rate inclusive of historical movements. This sort of correction is typical of commodity prices which are extremely volatile.

1515. We note the reason why NZIER is including historic information in determining the long-term price trend for steel. We agree with this approach, and would add that forecasts only are short term and would not provide a good representation of long-term evolution of steel.

1516. We note that NZIER's estimated price trend is higher than the price trend used in our draft. However, this price trend is in line with the historic average growth rate of 3% between 1995 and 2014, and the use of co-integrating relationships is more robust given that the series is stationary.

Long-term price trend for copper

1517. In our December 2014 UCLL draft determination, TERA has relied on a copper price (converted from US dollars to New Zealand dollars, using PPPs) from NZIER to estimate a price trend of 4.56% from 1995 to 2014.

1518. CEG proposed that we use a combination of LME history, futures and economic forecasts, and estimate the price trend based on the complete series, from 1990 to 2022.[860] CEG proposed that we use 4.46% as the price trend for copper. Network Strategies proposed that we use forecasts only, and estimated the price trend for copper at 0.53%.[861] Network Strategies submitted that beyond 2014, CEG only has four data points projected over a 7 year period based on within analysis. So CEG's

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857 Asia hot-rolled coil price, and consensus economic surveys for short term forecasting because there is no public futures market for steel in Asia.

858 Based on LME market futures to December 2018 and an extrapolation of Consensus Economic long-term forecasts to 2020 and beyond.

859 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission, May 2015), section 3.2.2.

860 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [59-62].

861 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, section 6.2. We assume that this price trend is most likely to exclude any currency effects.

selection of the forecast data governs the slope of the last 5 years, and this has an impact on the estimated long-term trend.[862]

1519. Vodafone submitted that CEG's copper prices are a combination of various data sources and missing data points, and this introduces additional error in the analysis.[863]

1520. NZIER estimated the price trend at 5%. NZIER used the LME price as the benchmark price for copper, and projected prices are a combination of futures prices and consensus economic forecasts, in New Zealand dollars. The price trend is based on both historic and forecast data.

1521. We noted that a growth rate only based on forecasts is 2.6% p.a. Accordingly, we asked NZIER to consider whether this estimated price trend is sustainable over the long-term. NZIER indicated that a price trend of 5% is sustainable because the estimated trend is lower than the historic growth rate of 6.4% between 1960 and 2005. Since 2005, prices grew by more than 12%, but we consider that this is most likely to be unsustainable. Given this, we consider that a growth rate of 5% is likely to be sustainable over the long-term.

Long-term price trend for fibre optic cables

1522. In the December 2014 UCLL draft determination paper, we used the capital price index for "insulated wire and cable; optical fibre cables" to estimate the price trend for fibre optic cables, from 1996 to 2013. TERA estimated the price trend at 4.88%.

1523. Submissions indicated that this series is inappropriate and unreasonable and is also driven by copper cables price evolution.[864,865,866]

1524. CEG provided the following alternatives.[867,868]

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862 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 45-46.

863 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, section E.2.6, E2.7.

864 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, Section 6.2; Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, section H3.

865 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [308].

866 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [63-71].

867 Ibid.

868 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [329-330].

1524.1 One option is based on the price Chorus pays its supplier for fibre cables (December 2002 and March 2014, is -15.7%).

1524.2 Another option is derived from the total optical fibre value and quantity indices reported on a monthly basis by the Japanese Electric Wire and Cable Makers Association (JCMA), as reported on Bloomberg (ie, CAOTOPTV index and CAOTOPTQ index). Submissions then derived a price index from these data as the value index divided by the quantity index (June 2009 and March 2014, is -15.0%).

1524.3 Another option is the US producer price index for fibre optic cable manufacturing in the United States (January 2004 and December 2014, is 0.43%).

1525. Network Strategies recommended that we should rather use international benchmark data based on benchmark data from Danish, Norwegian and Swedish models. Network Strategies noted that all the international benchmarks have a negative price trend for fibre optic cables in their TSLRIC models, and this suggests that a price trend of 4.88% is not appropriate.[869] In its cross submission, Vodafone and Network Strategies submitted there is a close relationship between Chorus prices and the JCMA data, which suggests that the latter data series may have more relevance for a New Zealand hypothetical efficient operator than the US PPI data.[870]

1526. NZIER indicated that it would not recommend using Chorus' own price index because the index likely reflects firm-specific decisions and would not be representative of cost trends. We asked Chorus at the conference about this series, and Chorus confirmed that the series is influenced by discounts specific for Chorus. So this indicates that the series is not representative of the long-term trend for fibre optic cables.

1527. NZIER agreed with submissions in that in the CGPI used in our December draft only comprises a small proportion of fibre optic cables, is dominated by copper, and the products are not similar to fibre optic cables. It is therefore not representative of cost trends for fibre optic cables.

1528. NZIER recommended that we use the US PPI, excluding currency effects. This index is specific for fibre optic cables produced by the fibre optic cable manufacturing industry. NZIER recognise that the series is available from 1988, but recommended that we only use the series from 2003 onwards, given the structural break around 2001. This is illustrated in the figure below.

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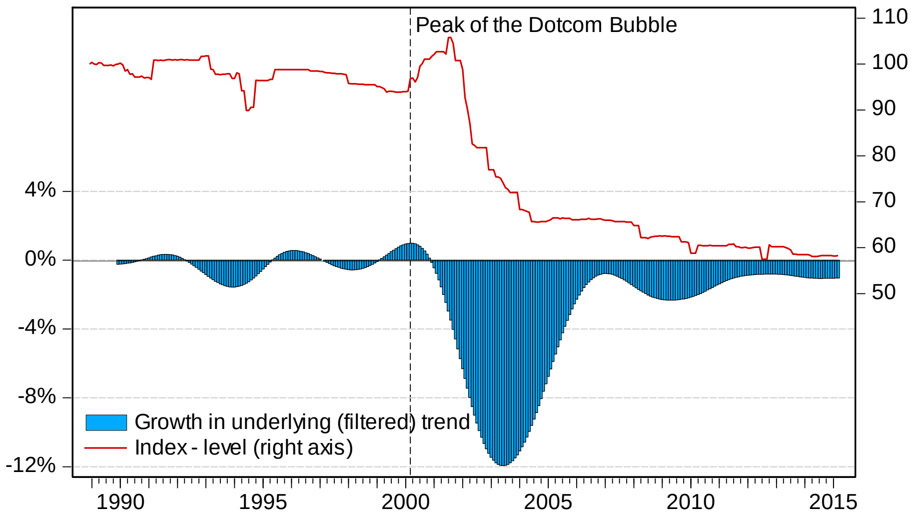
869 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, Section 6.2; Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, section H3.

870 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Review of issues from UCLL and UBA submissions" CONFIDENTIAL, 20 March 2015, p. 46-47.

Figure 2: Effect of dotcom bubble on fibre optic price trends



Source: NZIER, report to the Commerce Commission, "Price trends for UCLL and UBA final pricing principle" May 2015, Figure 11, page 20

1529. NZIER also indicated that the US PPI index is preferred over the JCMA because the US IPP follows established price index conventions and is constructed by a reputable independent central government statistical agency. JCMA is also a short series, 2009 to 2013, and this is not representative of a long-term price trend.

1530. NZIER estimated the price trend at -1.3% based on the historic average rate between 2006 and 2014. This trend excludes currency effects. NZIER indicated that there is no expectation that the price of fibre optics be correlated to with the value of the New Zealand dollar over the long-term. This is in contrast to commodity prices where the New Zealand dollar moves with changes in commodity prices.

1531. We recognise that the weakness of the US PPI series is that the series is short, and may not be representative of long-term price trends. In this regard, NZIER indicated that a number of series for fibre optic cables are published in Europe, with the longest series available in Germany (1996-2014). Using the series in Europe as a cross check, provides a range of -1.4% to -1.9%. This range is based currency neutral effects. So, this suggests that the price trend based on the US IPP seems to be reasonable.

1532. We considered whether a decreasing trend over the long-term is correct. From a theoretical perspective, our expectation is that the price trend for fibre, given that it is a new product would decrease at the start, with a greater decrease at first, and then stabilise over the long-term. So, it is important to reflect this in a long-term price trend.

1533. Some expert reports on fibre optic prices indicate that the price for fibre optics is expected to increase. For example, an article on "*The coming market for optical fibre and cable*" indicates that the price for fibre optics is expected to decrease until 2014, stay constant in 2014, 2015, 2016 and then increase in 2017 (around 2.9% from 2016).[871] This seems to support our *a priori* expectation on the price trend. However, there is no additional data/information available to build this into a price trend.

1534. We also considered the price trends used in other jurisdictions. Table 16 shows that the trends used on TSLRIC models in Sweden and Australia are all decreasing trends, but the trend used in Denmark and another European country is increasing. This information does not provide any conclusive evidence on the price trend for fibre optics in New Zealand context.

Table 16: Price trends used for fibre optic cables in international TSLRIC models

Country	Fibre price trend
Denmark	+2.0%
Sweden	-2.0%
Australia	-9.2%
European Country (confidential)	+3.0%

Source: overseas TSLRIC models

1535. Accordingly, our further draft decision is to adopt NZIER's recommendation. Given the uncertainty around what the price trend should be, our further draft decision is to adopt the US PPI index. This index is the most robust index available and specific for fibre optic cables.

1536. We recognised that it could be argued that we need to convert the index to New Zealand dollars to ensure consistency in our approach when we convert other international indexes, such as copper and steel to New Zealand dollars. However, we note that NZIER recommendation is that:[872]

> In our view there is no strong reason to conduct any adjustment for exchange rate effects. This is because there is no reason to expect the price of fibre optics to be correlated with the value of the NZ dollar and, over the long term, upward and downward swings in the value of the dollar should cancel each other out.
>
> This is in contrast to the case for commodity prices where the NZ dollar tends to move with changes in commodity prices and this has the effect of partially shielding New Zealand firms from increases in international commodity prices and also limiting NZ dollar reductions in prices of commodities being imported

1537. We agree with NZIER, and our preference is to adopt NZIER's recommendation and to base the price trend for fibre optics on the US PPI, with currency neutral effects.

871 See article at http://www.photonics.com/Article.aspx?AID=49953.
872 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission, May 2015), p.22.

Attachment J: Trenching costs

Purpose

1538. This Attachment sets out our further draft decisions on the:

1538.1 source of trenching costs; and

1538.2 application of a discount on trenching costs.

Our further draft decisions

Source of trenching costs

1539. We have sourced information regarding trenching and duct cost data from local costing experts Beca.[873]

Application of discount on trenching costs

1540. We have not included a discount for a large scale roll-out on trenching costs.

Source of trenching costs

Submissions

1541. In our December 2014 UCLL draft determination paper, we noted that it is difficult to benchmark trenching and duct costs due to their country-specific nature.[874]

1542. We therefore used trenching and duct cost sourced by Beca.[875]

1543. Based on Beca's costs analysis, TERA subsequently determined the efficient unit costs for trenching based on contractors' normal tender prices and applied them to the modelled network.

1544. Chorus has criticised Beca's trenching cost analysis for being based on a very limited data set not covering all New Zealand regions, causing it to not appropriately reflect regional variations in trenching costs.[876]

1545. Chorus has pointed out that trenching costs in urban areas like Wellington and Auckland are very high compared to the rest of New Zealand.[877]

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873 Beca is a professional service consultancy with a large presence in Asia Pacific including New Zealand. Beca delivers a variety of consultancy services across the buildings, government, industrial, power, transport and water market segments and consults to infrastructure providers.

874 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [338.3].

875 Beca "FPP Corridor Cost Analysis of Trenching and Ducting Rates in NZ - Final Issue Nov14" 25 November 2014.

876 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [120.1].

1546. Furthermore, Chorus has criticised Beca's analysis for being based on indicative quotes rather than actual market rates.[878]

1547. Consequently, Chorus stated that we should adopt Chorus' own build costs data included in the Analysys Mason model provided to us as the best available evidence of trenching and reinstatement costs.[879]

1548. The trenching cost used in Analysys Mason's model is a blended average trenching cost derived from actual trenching cost data from Chorus' ongoing UFB and RBI build.[880]

1549. Analysys Mason for Chorus agreed with Chorus that we should adopt Chorus' own build costs data and further stated that unit trench cost for urban areas needed to be revisited, as the Beca report stated that its analysis did not consider urban areas.[881]

1550. Analysys Mason also noted that no account is made of different reasons to use different trenching methods other than unit costs.[882]

1551. Aurecon for Chorus found Beca's report to be a good starting point at assessing the costs being faced on the UFB project but also found that it was not accurate enough in costing on assessing a standard trench and realistic reinstatement scenarios throughout New Zealand.[883]

1552. L1 Capital argued that, given the significant impact the trenching costs have on the calculation of total network costs, Chorus and LFC data should be better incorporated by us to reflect the realistic costs of building the network.[884]

1553. Chorus repeated its critique of Beca's trenching cost analysis in its cross submission.[885]

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877 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [409].

878 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [120.2].

879 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [121].

880 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [414].

881 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 30.

882 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 31.

883 Aurecon "Review of FPP Corridor Cost Analysis" CONFIDENTIAL, 10 February 2015, p. 4.

884 L1 Capital "Submission on draft UCLL and UBA pricing review determinations" 20 February 2015, p. 9.

1554. We have also received a number of submissions addressing very specific and technical details relating to the actual dimensioning of the trenches and ducts including the use of various diameters for sub-ducts. We have discussed these "technical" submissions with TERA. Responses to these points are set out in TERA's review of submissions[886] and have therefore not been included in this Attachment. We have reviewed this document and we agree with TERA's responses to the submissions made.

Analysis

1555. We agree with L1 Capital that the trenching costs make up a significant part of the total network costs and that it therefore is an area that needs significant attention.

1556. Because of this we hired Beca – experts in consultancy services to infrastructure providers with a long list of clients in New Zealand – to provide an independent analysis on the trenching cost in New Zealand.

1557. We have considered Chorus' general critique of Beca's trenching cost analysis and its consequent recommendation to rely on Chorus' actual trenching costs rather than Beca's analysis.

1558. To assist us in considering this critique, we have been guided by the regulatory framework in Chapter 1, on which this draft determination is based.

1559. The aspect of the regulatory framework that should be considered here is the TSLRIC objectives. The purpose of TSLRIC is not to recreate the regulated party's actual costs but to calculate the forward-looking, efficiently-incurred costs of providing the regulated services.

1560. This is done, where possible, by constructing a full model of the hypothetical efficient operator's costs from the bottom-up.

1561. As explained in Chapter 1, the hypothetical efficient operator operates in a world where Chorus' copper network does not exist in its current form.

1562. The costs on which Chorus and Analysys Mason have based their analysis are taken from Chorus' actual costs, which are based on the current roll-out of UFB and RBI – a roll-out which makes use of elements of Chorus' copper network where possible.

1563. Furthermore, unlike the hypothetical efficient operator's roll-out, Chorus' current roll-out of UFB and RBI is not nationwide. The trenching costs, which Chorus argue should form the basis of the modelled trenching costs rather than Beca's analysis, are based on coverage areas which for UFB roll-out are primarily related to Auckland

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885 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [146-147].

886 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Analysis of the industry comments following the December 2014 draft determinations" June 2015.

and Wellington.[887] This is obviously not representative of the costs of a nationwide roll-out.

1564. Although Chorus obviously will not have sought to incur more cost than is necessary, we do not consider that the trenching costs data provided by Chorus reflect a forward-looking, efficiently-incurred cost of the hypothetical efficient operator, calculated on a bottom-up basis. Based on these observations and given the regulatory context in which we base this draft determination, we disagree with Chorus. We do not agree that its trenching cost data provided gives a better estimate for the trenching costs encountered by the hypothetical efficient operator than Beca's cost analysis. Rather, we consider that Beca's cost analysis provides a well-documented, thorough representation estimate of the trenching costs of the hypothetical efficient operator rolling out a nationwide network in New Zealand.

1565. Following receipt of the submissions and cross submissions we asked Beca to review the submissions on trenching costs in order to determine whether there were any reasons for changing the methodology or the results of its cost analysis.[888] Beca produced a report on its assessment of the submissions which has been published along with this draft determination. We agree with Beca's analysis and recommendations outlined in its report.

1566. Analysys Mason submitted that our December 2014 UCLL draft determination paper did not include a link between Beca's trenching cost analysis and the type of trenching technology used in TERA's models, and we agree with this.

1567. This missing link meant that the trenching technology included in TERA's models was always the cheapest, but it did not take into consideration whether or not that specific technology was the most appropriate to use given the area is which the trenching took place.

1568. Therefore, as a direct response to Analysys Mason's submission, Beca has prepared a number of recommendations on trenching methodology including when and where a particular trenching technology is most appropriate and the limitations of each option. These are set out in the second Beca report at section 2-9.[889] This report has also been published along with this draft determination.

1569. This ensures that TERA, when modelling, took into consideration where the various trenching methods are possible to use when deciding what the cheapest trenching method is.

1570. As part of its second report, Beca has also made a number of adjustments to its cost analysis regarding reinstatement, trench reinforcement, traffic management, and type of duct used.

887 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross submission" CONFIDENTIAL, 20 March 2015, Annex A.

888 Beca "FPP Corridor Cost Analysis Response to Submissions" 17 April 2015.

889 Beca "FPP Corridor Cost Analysis – Report 3, New Rates and General Recommendations" 5 June 2015.

1571. The adjustments regarding reinstatement, trench reinforcement and traffic management have been made in order to further align the cost analysis with the network modelling.

1572. As for the type of duct used, Beca's updated trenching cost analysis uses HDPE (high-density polyethylene) ducts rather than uPVC (unplasticised polyvinyl chloride) ducts as HDPE ducts are very commonly used in the deployment of telecommunication network and provide fully sufficient protection of the cables.

1573. The recommendations and rates provided by Beca are set out in the second Beca Report at section 12-15 and we agree with the various recommended changes made by Beca in this regard.

1574. Based on its review of the submissions and cross submissions Beca concluded the following: [890]

> In summary, we believe that the use of the FPP Corridor Analysis of Trenching and Ducting Rates in New Zealand report, dated 25 November 2014, together with the Corridor Cost Analysis of Trenching and Ducting Rates in New Zealand workbook will provide an accurate basis for estimating the total cost of this work within New Zealand. Regional variances are to be expected and there is no doubt that trenching work in some locations around New Zealand will present challenges relating to productivity and profitability. However with careful management of their regional subcontracts Chorus should be able to offset these shortfalls with long runs of relatively easy and uneventful trenching activity, particularly in rural and low density suburban areas.

1575. Therefore, as we are modelling the trenching costs for the roll-out of a national network for the hypothetical efficient operator and not Chorus' actual trenching costs, coupled with Beca's expertise and independence, we see no compelling reasons, at this stage, for changing our preliminary position. We consider that for the purpose of the TSLRIC-pricing principle it is most appropriate to rely on Beca's cost analysis for the calculation of trenching costs.

Application of discount on trenching costs

Submissions

1576. In our December 2014 UCLL draft determination paper we did not apply any discount to the trenching cost analysis produced by Beca.

1577. Beca stated in its costs analysis that Chorus could potentially be able to negotiate rates for trenching costs up to 20% below the contractor's normal tender price, but did not take this potential discount into account when calculating the unit costs of the trenches and ducts.[891]

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890 Beca "FPP Corridor Cost Analysis Response to Submissions" 17 April 2015, p. 12.
891 Beca "FPP Corridor Cost Analysis of Trenching and Ducting Rates in NZ - Final Issue Nov14" 25 November 2014, p. 9.

1578. Chorus submitted that using its UFB build prices would reflect a large scale network roll-out over a short time and the economies of scale, including bargaining power, inherent in a large build.[892]

1579. Network Strategies for Spark and Vodafone submitted that since the hypothetical efficient operator is deploying a nationwide network it would have a similar scale to Chorus and as such be able to negotiate similar discounts to those achieved by Chorus.[893]

1580. Specifically, Network Strategies recommended adjusting the trenching cost by around 20% to take into account the volume/scale discounts that the hypothetical efficient operator would achieve.[894] No evidence was provided to justify such a discount.

1581. Spark submitted that the hypothetical efficient operator deploying large-scale networks in New Zealand would apply rigor to the exercise of driving supplier costs down and found that the trenching costs used in our models appeared to be systemically overstated.[895]

1582. WIK for Spark and Vodafone found it reasonable to assume that the basic data collected by Beca represented a saving potential for the trenching cost between 30-45%.[896] No evidence was provided to justify such a discount.

Analysis

1583. Following submissions, we have asked Beca to thoroughly investigate the possibility of including a discount in its trenching cost analysis.[897]

1584. Notwithstanding Beca's initial observation that there is potential for a discount for a large scale trenching project, it has not been able to verify, to any degree of certainty, what this would be. In fact Beca has said that when tendering in a localised market, larger packages of civil work will not necessarily result in greater discounts than small to mid-size packages.

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892 Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [149].

893 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, p. 39.

894 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL, 20 February 2015, p. 39.

895 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [60].

896 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [353].

897 Beca "FPP Corridor Cost Analysis – Report 3, New Rates and General Recommendations" 5 June 2015.

1585. Therefore, Beca believes that the national average rates provided in its trenching cost analysis are competitive and would not likely be any lower (on average across the country) when offered to the tender market in large packages of work.[898]

1586. Consequently, Beca does not recommend including a discount.

1587. We have considered the arguments for and against applying a discount to Beca's trenching cost analysis.

1588. We do not find the proposals to include a discount between 20% and 45% justified, as these numbers lack any supportive evidence.

1589. Therefore, based on our review of the submissions, Beca's independent research, and the evidence provided to date, we do not consider it justified that the modelled hypothetical efficient operator, despite the scale of the network roll-out, would be able to get a discount which should be applied to Beca's trenching cost analysis.

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[898] Beca "FPP Corridor Cost Analysis – Report 3, New Rates and General Recommendations" 5 June 2015, p. 13.

Attachment K: Capital Contributions

Purpose

1590. The purpose of this section is to determine the treatment of capital contributions in the access network model.

1591. When considering this issue, we have thought about whether the hypothetical efficient operator would incur all of the capital costs of building its hypothetical UCLL network, or whether some capital costs should be deducted for parts of the network because the hypothetical efficient operator would not incur those costs itself and would pass them directly to the end-user. We have also considered and been guided by real-world practice.

1592. We have also considered what regulatory obligations the hypothetical efficient operator is likely to be subject to.

Draft decisions

1593. Based on our decision to assume that the hypothetical efficient operator would be subject to the TSO obligations, the hypothetical efficient operator would be required to build without end-user contribution, the network as it was in December 2001, except for lead-ins as explained below.

1594. For lines installed after this date the hypothetical efficient operator has the ability to require a contribution.

1595. Our view is that the hypothetically efficient operator would apply the following rules to capital contributions:

    1595.1 For underground network deployment within the TSO boundary (that is the notional boundary drawn around end-users as at December 2001):

        1595.1.1 The cost of trenching for all lead-ins (from the property boundary to the building) is to be excluded from the TSLRIC cost.

        1595.1.2 The cost of trenching, cable and reinstatement for all lines connected at December 2001 (ie all TSO lines) is to be included in the TSLRIC cost.

        1595.1.3 The cost of trenching and reinstatement for subdivisions post-December 2001 (ie lines that are within the TSO boundary but not connected at December 2001) is to be excluded from the TSLRIC cost.

    1595.2 For aerial network deployment within the TSO boundary, the full cost is to be included in the TSLIC cost.

    1595.3 For lines deployed outside the TSO area no capital costs will be included in the TSLRIC costs.

1595.4 Lines deployed as part of the RBI roll-out will be discussed in the UBA draft determination.[899]

Definitions

1596. Before we consider the submissions received and our reasons for our draft decisions, we think it is important to set out the definitions and phrases that we have used.

TSO

1597. The TSO obligation refers to an obligation originally placed on Telecom in 2001, which has now being extended to Chorus. In broad terms, the Act prescribes that customers connected to lines that were connected at December 2001 must be provided service by Chorus for the standard charges (we call these TSO lines).

1598. The TSO boundary (also known as the TSO footprint) is the notional boundary drawn around all end-users in situ and being provided service by Telecom as of December 2001, and includes subdivisions within that boundary which have been constructed since 2001.

Contributions

1599. Some parts of Chorus' network were not supplied by Chorus. When these have been provided by a third party or by end-users we have termed this a contribution.

1600. Contributions, as referred to in this document, can be in cash or in kind in a variety of circumstances.[900] We understand the typical types of contribution received by Chorus towards the capital cost of building its copper network have been:

1600.1 The extension of its network outside the TSO boundary (full cost recovery);

1600.2 Contributions to lines prior to December 2001 (provision of a free trench for underground lead-ins and cash payment for new aerial lead-ins);

1600.3 Contributions to subdivisions inside the TSO boundary since 2001(provision of a free trench and/or a cash contribution);

1600.4 RBI subsidies (in rural areas);

Lead-ins

1601. Lead-ins (sometimes also called drop-leads) are the connections between the end-user's External Termination Point (ETP) and the shared network in the street. They may be deployed aerially or underground. The contributions that Chorus receives towards the lead-ins generally relate to the part of network between the property boundary and the ETP.

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899 Commerce Commission "Draft pricing review determination for Chorus' Unbundled Bitstream Access Service" 2 July 2015, Attachment K.

900 A contribution in kind refers to the case where Chorus avoids costs by assigning responsibility to the end-user to undertake the work.

December draft decision

1602. In our December 2014 UCLL draft determination paper we considered that premises within the TSO boundary would be likely to be connected by the hypothetical efficient operator, with both capex and opex being incurred by the hypothetical efficient operator. [901] We considered that premises outside the TSO boundary would only likely be connected where a capital contribution was made by the end-user (with only opex being incurred by the hypothetical efficient operator). [902]

1603. We included the full costs of subdivisions inside the TSO boundary and the full costs of all drop-leads in our TSLRIC model.

Submissions

1604. In its submission, Chorus said that it would be wrong to exclude capital costs on the basis that they would be recovered through some hypothetical charge.[903] Chorus also said that section 30S of the Act obliges it to supply any end-user with a metallic path facility (MPF), so the entire footprint must be modelled. To do otherwise, it submitted, would depart from statutory requirements, and would also be subjective and arbitrary.[904] Chorus also raised an issue with our model.[905] It pointed out that the way our model worked meant that the cost of infrastructure serving TSO customers was omitted if the infrastructure itself was outside the TSO area. This modelling error has been rectified.

1605. Spark submitted that capital contributions from central government (UFB and RBI funding), industry (TSO funding) and end-users (lead-in costs and network extensions) should be included in our model, because the hypothetical efficient operator would seek them, and that this was necessary to avoid double recovery.[906]

1606. Vodafone submitted that we should assume that the hypothetical efficient operator receives subsidies equivalent to those received for the UFB rollout, and that these should be treated as grants to the hypothetical efficient operator.[907] Vodafone also submitted that we should remove end-user connection fees to avoid the error of double counting capex contributions.[908]

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901 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [488].

902 Ibid.

903 Chorus, “Submission for Chorus in response to draft pricing review determinations for Chorus’ unbundled copper local loop and unbundled bitstream access services (2 December 2014) and process and issues update paper for the UCLL and UBA pricing review determinations (19 December 2014)” , para [99].

904 Ibid, paras 96–100.

905 Ibid, paras 110–114.

906 Spark “UBA and UCLL FPP pricing review draft decision” 20 February 2015, paras [189–195].

907 Vodafone New Zealand submission to the Commerce Commission on process and issues and draft pricing review determinations for Chorus’ unbundled local loop and unbundled bitstream access services and comments on Analysis-Mason’s TSLRIC models” 20 February 2015 , para [J2].

908 Ibid, recommendation 19.

1607. Wigley and Company submitted that it supported RBI capital cost exclusions.[909]

Analysis

1608. We consider that the question regarding capital contributions is inherently one of discretion to be exercised by us. Therefore,

1609. We have first considered what regulatory obligations the hypothetical efficient operator would be under.

1610. To ensure the hypothetical efficient operator is grounded in the real world, we have decided to assume that the hypothetical efficient operator would be subject to the TSO obligations. We consider that it is reasonable to assume that the hypothetical efficient operator would be subject to a form of universal service obligation, and our approach is consistent with the reference to TSO costs in the definition of "forward-looking common costs" in Schedule 1 of the Act.

1611. Chorus submitted that section 30S of the Act obliges it to supply any end-user with an MPF, meaning that the entire network must be modelled without contributions being sought. However, we do not accept Chorus' argument that we must, as a matter of law, require that the hypothetical efficient operator build a network that encompasses the present STD footprint without being able to seek capital contributions. Our view is premised firstly on the fact that we consider it a discretionary matter as to the scope of the network the hypothetical efficient operator builds. Secondly, we note that Chorus does seek contributions which we consider are a relevant factor in our assessment.

1612. We have then considered that, consistent with the practice of telecommunications operators in the real world, such as Chorus, where our hypothetical efficient operator was allowed to command a contribution, it would do so. As we are imposing the TSO obligation on the hypothetical efficient operator, we consider it appropriate to look to Chorus as a proxy for the implementation of these obligations, as we consider Chorus' treatment of capital costs to be typical of industry practice. Therefore, we consider that where Chorus is obliged to provide service, so is the hypothetical efficient operator. Similarly, where Chorus collects a contribution, or requires a third party to supply the trench or similar, then so could the hypothetical efficient operator.

1613. As we have assumed that the hypothetical efficient operator would be subject to the TSO obligations, we have required it to provide the TSO lines, being those inside the TSO boundary and built before 2001. By way of a proxy, as Chorus is subject to the TSO obligations, we have considered how it has treated capital contributions in relation to TSO lines.

1614. In this regard, there is evidence that Telecom required a trench to be provided by the end-user for underground drop-leads prior to 2001.[910] On the basis of this

[909] Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services", 20 February 2015, para [3.1].

evidence, and using past history of what has happened in NZ, our view is that our hypothetical efficient operator is entitled to require a contribution for these lines.

1615. On this basis we have excluded the costs of trenches and reinstatement between the boundary and the ETP for underground lead-ins installed before 2001 from the TSLRIC cost. However we would welcome further evidence and submissions on this point.

1616. We now must deal with the network that is not covered by the TSO obligation, that is the network that was built after December 2001. We consider that there are a range of approaches.

1617. A factor that we have considered is the payments received by Chorus for building and extending its network. Currently we understand that Chorus imposes fees for the installation of aerial lead-ins and for reticulating subdivisions.

1618. The two extremes of view, both of which were submitted on, are:

1618.1 We could ignore payments received, since this is a TSLRIC cost model, and the source of the funds and Chorus' actual costs are not relevant.

1618.2 We could deduct all such payments received by Chorus from the TSLRIC cost of the network. To do otherwise would be to mandate double recovery by Chorus.

1619. We consider that the Act demonstrates a general intention that Chorus should not over recover its costs[911]. We do not consider that it would promote competition for the long-term benefit of end-users, to permit Chorus to recover a cost that would be, or is in actual fact, borne by end-users or third parties.

1620. Our position in the December 2014 draft determination paper was that we would only make deductions from the TSLRIC cost of the network in respect of network extensions outside the TSO boundary. Chorus submitted that it is our job to model the cost of the service and we are not entitled to assume that the hypothetical efficient operator would require some of that cost to be paid by end-users.

1621. However, following consideration of the submissions received and based on the evidence available that shows that a portion of these costs are met by end-users we have reconsidered our initial position. We consider the fact that the Act evidences a general intention that Chorus should not over recover its costs, coupled with the TSLRIC exercise we are undertaking, in determining an efficient long-run incremental cost, we have modified our position to take account of the real world situation.

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[910] http://www.telepermit.co.nz/Urban.pdf contains a brochure suggesting that end-users must provide the trench for underground drop-leads. Meta data for the page indicates it was created in 1999.

[911] The definition of TSLRIC in Part 1 Subpart 1 in Schedule 1 of the Act states that:

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….*****[emphasis added]**

1622. In short, we will deduct capital contributions only to the extent that they influence the TSLRIC cost of the network, and therefore the final price.

1623. As such, our current view on contributions is as follows:

1623.1 For underground network deployment within the TSO boundary (that is the notional boundary drawn around end-users as at December 2001):

1623.1.1 The cost of trenching for all lead-ins (from the property boundary to the building) is to be excluded from the TSLRIC cost.

1623.1.2 The cost of trenching, cable and reinstatement for all lines connected at December 2001(ie all TSO lines) is to be included in the TSLRIC cost.

1623.1.3 The cost of trenching and reinstatement for subdivisions post-December 2001 (ie lines that are within the TSO boundary but not connected at December 2001) is to be excluded from the TSLRIC cost.

1623.2 For aerial network deployment within the TSO boundary, the full cost is to be included in the TSLIC cost.

1623.3 For lines deployed outside the TSO area no capital costs will be included in the TSLRIC costs.

1624. Contributions received by Chorus that do not result in the creation of identifiable assets, for example the cash contribution Chorus receives for reticulating subdivisions and aerial lead-ins, have not been taken into account.

1625. In this regard, for the purposes of determining all types of contributions that could impact the cost for the hypothetical efficient operator, we have considered the impact of UFB and TSO funding on our model. However, to our knowledge the UFB network has not benefited the network we are modelling. Therefore, based on our position that we are only going to deduct capital contributions to the extent that they influence the TSLRIC cost of the network, we do not consider UFB funding relevant, as Spark and Vodafone submitted we should.

1626. Chorus charges $195 for the installation of aerial lead-ins and charges developers a fee in subdivisions. As set out above, we have not taken these amounts into account in our modelling to date. This means we have not deducted from the TSLRIC cost the amount of money Chorus receives for the installation of aerial lead-ins and for reticulating subdivisions.

1627. We have not done this is for two main reasons. First because the link between the dollar amount collected by Chorus and the TSLRIC cost is not clear to us. Secondly because we have no historical information regarding what Chorus (or Telecom) has charged for aerial lead-ins in the past.

1628. We would be pleased to receive submissions providing more information on these charges and submitters' views on how these should be taken into account.

1629. We have considered the implication of the inclusion of the RBI subsidy. The RBI subsidy resulted in Chorus upgrading (or installing) a number of cabinets and DSLAMs. Much of the subsidy, in the real world, would have been used to provide optical fibre feeders to these upgraded cabinets, but this has no impact on the UCLL TSLRIC cost, as we model a trench over that route in any case, so now we just put fibre in the trench. Therefore, the increase in modelled cost is the additional cost of the upgraded cabinets and the DSLAMs. Note that this is only relevant for the UBA model, and does not impact on the UCLL cost or resulting price.

1630. In summary, it is our view that a hypothetical efficient operator would require a capital contribution for some of its capital costs and that these contributions, where they are made, should not be part of the TSLRIC cost and we welcome submissions in this regard.

Attachment L: Modelling basis for taxation

Purpose

1631. This Attachment outlines how we have treated tax in our TSLRIC model.

Our further draft decision

Maintain our proposed approach of pre-tax amounts

1632. Our further draft decision is that the TSLRIC-based price we derive will be a pre-tax amount. Given that the price we derive will be a pre-tax amount, our further draft decision is to adjust the tilted annuity capital charges for each type of asset by taking into account an appropriate tax depreciation rate. This is the same approach as presented in our December 2014 draft determination paper and July 2014 Regulatory Framework and Modelling Approach paper.[912]

1633. The reason for our further draft decision is to ensure that the result is not an inaccurate TSLRIC-based price due to an over estimation of the tax position of the hypothetical efficient operator, which would occur if the tax model adopted a simple pre-tax calculation that assumed the corporate tax rate.[913] We consider that this is consistent with our framework for carrying out the pricing review.

Summary of our proposed approach

1634. Our approach for the tax adjustment is the sum of the full (infinite life) stream of diminishing value depreciation allowances (ie, the sum of a power series).[914]

1635. We sourced the diminishing value tax deprecation rates for each asset class defined in our TSLRIC model from IRD.[915] We matched the asset classes defined in our TSLRIC model with the asset classes defined by IRD. For those asset classes defined in our model and not explicitly defined by TERA, we considered the default tax depreciation rate provided by IRD.[916]

1636. Our matching exercise, and the resulting diminishing value used for each asset class, is published as a separate Excel workbook with this draft determination.

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912 Commerce Commission "Regulatory framework and modelling approach" (draft determination, 9 July 2014) paragraphs [253-258].

913 In New Zealand, a firm can reduce its taxation payments by deducting depreciation from the taxable earnings. This depreciation tax shield is computed as the amount of allowable depreciation multiplied by the tax rate. The use of accelerated depreciation methods during the early years of an asset's life will provide for a greater tax shield during the asset's early life and hence increase the NPV of the tax shield.

914 Further explanation of our view on tax adjustments is in Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, Attachment A.

915 http://www.ird.govt.nz/resources/6/5/6576ff004ba3cf748844bd9ef8e4b077/ir265.pdf.

916 We note that the model groups land and buildings together with the same depreciation rate, although in practice land is not depreciable for tax purposes.

Our July 2014 consultation on the treatment of tax

Overview of our July 2014 consultation and response

1637. We received several submissions and cross submissions on our July 2014 regulatory framework and modelling approach paper that presented our proposed pre-tax approach. We responded to these submissions in the December 2014 UCLL draft determination paper. Our December 2014 UCLL draft determination paper presented a new explanation of how we adjust the pre-tax annuity factor used to calculate the tilted annuity capital charges.

Transparency of our model

1638. Vodafone, WIK, Network Strategies and Spark submitted that it was unclear how we proposed to model tax related cash flows and had used of nominal and real cost through the model.[917]

1639. In response, in both our December 2014 UCLL draft determination and now in our further draft determination, we further explain our approach and publish our tax model to provide more transparency.

Use of pre-tax values and WACC

1640. WIK submitted that it is common international practice to apply adjustments for tax in the WACC, but that our tax approach is unusual and proposed an alternative formula.[918]

1641. Vodafone submitted that tax adjustments should be made within the WACC formula, as corporate taxes impinge on the return on equity capital.[919] Network Strategies recommended using a pre-tax WACC approach.[920]

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917 Spark New Zealand "UCLL and UBA FPP: consultation on regulatory framework and modelling approach - Cross submission Commerce Commission" 20 August 2014, paras [143]-[145]; Network Strategies "Final report for Telecom New Zealand and Vodafone New Zealand - Key issues in modelling UBA and UCLL services - Commission consultation on regulatory framework and modelling approaches for FPP process" 6 August 2014, p. 55-56; WIK-Consult "Report for Telecom New Zealand and Vodafone New Zealand - Submission - In response to the Commerce Commission's 'Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)'" 5 August 2014, paras [70]-[71]; Vodafone NZ "Submission to the New Zealand Commerce Commission - Comments on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, section G.

918 WIK-Consult "Report for Telecom New Zealand and Vodafone New Zealand - Submission - In response to the Commerce Commission's 'Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)'" 5 August 2014, para [71]. Also see paras [59]-[69].

919 Vodafone NZ "Submission to the New Zealand Commerce Commission - Comments on Consultation paper outlining Commission's proposed view on regulatory framework and modelling approach for UBA and UCLL services" 6 August 2014, Section G9.

920 Network Strategies "Final report for Telecom New Zealand and Vodafone New Zealand - Key issues in modelling UBA and UCLL services - Commission consultation on regulatory framework and modelling approaches for FPP process" 6 August 2014, p. 53-54. Network Strategies also submitted that our proposed approach is different to the approach used in TSO determinations. We agree. In the TSO determinations, we used the post-tax nominal WACC based on corporate tax.

1642. Our response is that our tax approach and an approach to apply tax adjustments for tax in the WACC will result in an equivalent outcome. Our approach applies another way to adjust for tax in the WACC.

1643. In its cross submission, Chorus confirmed this view:[921]

> The derivation of this formula is not provided by the Commission which is perhaps why WIK and Vodafone appear not to understand it. However, it is useful to note that dividing a post-tax WACC of the above form by (1-t), which the Commission formula does, gives the same formula as WIK proposes in equation 13 reproduced above

1644. Chorus also argued in its cross submission that: [922]

> WIK and Vodafone's responses to the Commission's proposals on modelling the cost of tax appear to be based on the incorrect belief that a simple transformation of the WACC can be used to account for the fact that tax depreciation differs from the actual rate at which capital is returned (depreciated) within the tilted annuity.
>
> ….WIK and Vodafone are incorrect in relation to the second dot point. Differences between the rate of tax depreciation and regulatory depreciation (return of capital) must be accounted for separately – which is what the Commission's formula attempts to do.

1645. We agree and note that our proposed formula accounts for the differences between regulatory depreciation and tax depreciation.

Use of Excel PMT function

1646. Analysys Mason for Chorus, argued that if we adopt a software implementation using the Excel PMT function for defining the annuity calculation, we need to provide arguments for doing so to avoid the potential for later debate.[923,924]

1647. Our response is that the Excel PMT function is a widely used and tested function that provides for transparency. We have adopted the Excel PMT function in our annuity calculation.

Notional tax position of the hypothetical network operator

1648. Chorus argued that our proposed approach assumes that 100% of interest and depreciation tax deductions will be deducted in the year they occur, and that this meant that our tax model assumed that there is a zero probability of the

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921 Chorus "Cross submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 20 August 2014, paras [118] and [150].

922 Chorus "Cross submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 20 August 2014, paras [117]-[119].

923 Analysys Mason "Report for Chorus - Response to Commission consultation on regulatory framework and modelling approach for UCLL and UBA" 6 August 2014, section 1.19.

924 PMT is a Microsoft Excel function that calculates the payment for a loan based on a specified number of constant payments, and a constant interest rate.

hypothetical efficient operator ever being in a tax loss position. Chorus argued that this may not be reasonable.[925]

1649. In its cross submission, Network Strategies also argued that our approach implicitly assumes that the hypothetical efficient operator is not in a tax loss situation and submitted that it is a common approach in TSLRIC modelling. Network Strategies recommended that we make an explicit statement on the assumed tax situation of the hypothetical efficient operator.[926]

1650. In the December 2014 UCLL draft determination paper, we responded that our approach provides for the notional tax position of the hypothetical efficient operator because:

1650.1 The price that we set is based on a subset of the notional tax position of the hypothetical operator. The overall tax position of the hypothetical efficient operator will include a wider group of other telecommunication services. Within this wider group of services there may be some subsets that incur tax losses, even when the hypothetical efficient operator's overall tax position is positive. This is consistent with the definition of TSLRIC referring to "the service provider's provision of other telecommunication services".

1650.2 From a section 18 purpose statement perspective, it is difficult to see why the competitive market price is likely to be dependent on the tax position of a particular market participant.

Submission on our December 2014 UCLL draft determination paper

1651. In response to our December 2014 consultation, Chorus submitted:[927]

> We generally agree with the Commission's approach to tax, save of its position on the valuation of deductions

1652. Chorus raised several issues about how our model treated tax losses and argued that we should adopt more realistic assumptions regarding the hypothetical efficient operator's business.[928,929]

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925 Chorus "Submission in response to the Commerce Commission's Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)" 6 August 2014, paragraphs [141]-[144].

926 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Cross submission for consultation on UCLL and UBA FPP regulatory framework - A review of selected issues in submissions on the Commission's consultation paper of 9 July 2014" 20 August 2014, paragraph [7.2].

927 Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, paragraph [310].

928 Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, paragraph [311].

929 Chorus also proposed an amendment to the PMT formula used in our explanation of our modelling basis for taxation (Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, para 317). We agree with Chorus' proposal, but note that this issue does not affect the worked example of our tax model that we previously released (Tax- model-30-September-2014).

Overall tax position of the hypothetical efficient operator group

1653. Chorus did not support our view that that the overall tax position of the hypothetical efficient operator should include a wider group of telecommunication services.

1654. We consider that our view of the hypothetical efficient operator being part of a business with a wider group of services is consistent with the definition of TSLRIC referring to *"*the service provider's provision of other telecommunication services*"*.

1655. We also consider that this view is realistic since Chorus provides multiple services.[930] Therefore, we do not agree with Chorus that our view "stretches the hypothetical framework too far".[931]

1656. Chorus also submitted that our view "does not recognise the reality that even multi-operations business can nevertheless make an overall tax loss at various times".[932]

1657. We note that Chorus's financial statements show that it has paid tax for each year since it was separated from Spark/Telecom and that prior to separation the Telecom group was profitable.[933]

1658. Our TSLRIC model is designed to provide a long term price and, therefore, reflects long term positions, even if there are short term variances. We note that in practice while some firms may incur a tax loss at some times, at other times these firms may experience larger than average tax profits, and/or use accounting and tax planning techniques to influence specific year's tax positions.

Assumed tax loss during initial years

1659. Chorus stated that the Commission's model indicates that taxable income relating to the UCLL and UBA service is negative for the first three years.

1660. Chorus referred to row 22 of our Excel model "Tax- model-30-September-2014" to support this statement.[934,935] This model was a hypothetical example that we

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[930] For example, on https://www.chorus.co.nz/our-products#cs-166195, Chorus lists its services as including commercial access to our exchanges, poles and other infrastructure, transport services, development and testing facilities, businesses phone and broadband services over copper and fibre including dark fibre and grey fibre, and phone and broadband services over copper and fibre for residential customers (url referenced 9 June 2016).

[931] Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, para [315].

[932] Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, para [315.3].

[933] Chorus' financial statements showed that it had income tax expenses of $58M in 2014, $65M in 2013 and $40M in 2012.

[934] Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, para [313].

[935] This Excel model can be found on our website at http://www.comcom.govt.nz/regulated-industries/telecommunications/regulated-services/standard-terms-determinations/unbundled-copper-local-loop-and-unbundled-bitstream-access-services-final-pricing-principle/.

provided to explain our taxation methodology. It is not the calculation used to calculate the further draft price (or the previous draft prices).

1661. The notional tax loss in the early years of the hypothetical example is partly due to the choice of diminishing value depreciation rate (15%, which is comparable to that used for shorter life assets such as switching equipment) used. A different depreciation rate would have resulted in a different tax calculation. Other factors such as assumptions regarding income and debt leverage also impact the example's tax calculation.

1662. In calculating the tax component of the tilted annuity charge, we assumed diminishing value depreciation (ie, accelerated tax depreciation) and that there was no accumulated tax depreciation at the start of the regulatory period. A flow on effect, of continuing to apply these assumptions, is that the hypothetical efficient operator's has a higher notional depreciation tax shield in later years.

1663. Had our model assumed diminishing value tax depreciation with an even spread of asset lives, the notional tax effects would be flatter.[936] This later scenario would be more representative of an access provider, such as Chorus, that has an existing network built up over time.

1664. We consider that it is neither necessary, nor appropriate, to include all possible flow on effects of assumptions regarding the hypothetical network operator into the forward-looking efficient prices. We consider that the relationship between the depreciation approach used to calculate tilted annuities and its flow on effect on notional tax depreciation shields (and any impact that they may have on a notional tax loss) is an example of this principle. This reflects that the notional tax position of the hypothetical efficient operator is unlikely to match the reality of an existing operator with assets of mixed lives.

Other new businesses making tax losses

1665. In response to our view that the overall tax position of the hypothetical efficient operator will include a wider group of other telecommunication services, Chorus submitted "if the HEO is also simultaneously entering other business lines then these business lines will add to the tax loss problem".[937]

1666. If this scenario was to arise, we would expect that the hypothetical efficient operator's management would have assessed the long run profitability and tax implications of the new business before investing. In doing so management should have considered matters such as taxation and made decisions to minimise the risk of taxation problems.

1667. We note that this argument relies on a hypothetical example that makes additional assumptions about the timing, scope and tax position of the hypothetical efficient

[936] This is because there would be less depreciation upfront, but as more assets would be replaced during the regulatory period there would be more depreciation in later years.

[937] Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, para [315.2].

operator's businesses. These new assumptions are outside of the scope typically included in TSLRIC models.

1668. We consider that Chorus' example is hypothetical, and deals with an issue outside of the scope of our pricing review.

Modelling of tax costs

1669. Chorus submitted that we should model tax costs explicitly within our model by accumulating any early tax losses and offsetting them against later tax liabilities. Chorus also submitted that it we did not do so then we should scale up asset values for early tax losses.[938] Both of Chorus' proposals assume that there are initial tax losses, and that these losses are carried forward into later years, rather than used to offset other tax obligations.

1670. We consider that the proposed model changes are unnecessary.

1670.1 We consider that the notional tax position of the hypothetical efficient operator should be viewed in the context of the group's wider tax position. Therefore, any initial tax losses could generally be used to offset other tax obligations, rather than carried forward. We consider that this is realistic, as it reflects how many companies operate.

1670.2 We do not consider it necessary to model the "costs" of carrying forward any tax loss, when any such tax loss (and in particular the tax depreciation shield) is notional to the hypothetical efficient operator, and not necessarily reflective of an existing network operator's tax position.

1671. Therefore, we do not consider that there is a need to separately model the hypothetical efficient operator's tax payments in the TSLRIC model or to scale up asset values for possible initial tax losses. Given Chorus has a history of a positive tax position, we consider that this is a realistic approach.

Separating tax costs from other costs

1672. In questioning our approach to tax, Chorus submitted:[939]

> For the purposes of estimating price to be set adopting a TSLRIC methodology, it is the competition of the HEO ... which must be considered. Therefore, it is the costs of the HEO, including its tax costs, which must be considered in the same way the capex and opex of the HEO must be considered. There is no principled basis to distinguish tax costs from the HEO's other costs.

1673. Our response to the first two sentences of the above quote is that it is not clear why if Chorus submits that we must consider the "competition of the HEO" in estimating the TSLRIC price that we should therefore consider the hypothetical efficient operator's costs, rather than the competitors' actual or potential costs. We consider

[938] Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, para [316].

[939] Chorus "Submission in response to the Commerce Commission's Draft Pricing Review Determinations for Chorus' UBA and UCLL services (9 July 2014)" 2 December 2014, para [315.4].

that if we were to take account of the competition's possible impact on market prices, that we should examine the competition's costs (eg, as would be done using the economic theory of setting price based on the cost of a potential market entrant).

1674. In regard to Chorus' last sentence, we consider that it is appropriate to use a pre-tax approach that treats the hypothetical efficient operator's income tax costs different to opex and capex. This recognises that the opex and capex costs are typically determined by engineering rules, such as cost-volume relationships, within the TSLRIC model. On the other hand, income tax is accounted for using financial formulae that include factors such as the post-tax cost of capital (WACC). Chorus in its submissions did not object in principle to the inclusion of tax as a parameter in setting the annuity factor or the post-tax WACC.

Attachment M: Operating expenditure

Purpose

1675. The purpose of this Attachment is to outline how we treat network operating expenditure (opex) in our TSLRIC model for the UCLL service. We discuss our earlier views in respect of the treatment of opex, views of submitters, and our subsequent analysis and draft decisions.

1676. We note that the discussion set out in this Attachment is at a relatively high level. TERA has built a separate model to calculate the opex that is used as an input into the TSLRIC model, and the opex model has a number of detailed implementation aspects. We have discussed the implementation of the opex model with TERA, and we agree with the specific details of the model. For a discussion of the detailed treatment of opex in this model see TERA's Model Specification and Model Documentation papers.[940]

Our draft decisions

1677. Our draft decisions in respect of opex for the UCLL service are set out as follows:

1677.1 Our starting point is to use Chorus' financial accounts to determine opex in our TSLRIC model.

1677.2 We have then scaled down Chorus' opex by a factor of 40% as a proxy for the likely lower opex that can be achieved on our hypothetical efficient operator's FTTH/FWA network as compared to Chorus' copper network.

1677.3 We then applied an upwards adjustment to maintenance opex based on line fault indices as a proxy for the likely higher fault rates of our hypothetical efficient operator's FTTH/FWA network, which has a larger proportion of aerial deployment relative to Chorus' copper network.

Proposed approach to calculating opex in our December 2014 UCLL draft determination paper

1678. In our December 2014 UCLL draft determination paper we set out how we modelled network opex in our TSLRIC model.[941]

1679. We noted that our starting point was to obtain information on opex for Chorus' current copper network from Chorus' financial accounts.

1680. We then applied an efficiency adjustment to reflect likely lower line fault rates that our hypothetical efficient operator would be faced with in deploying a FTTH/FWA

[940] TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: – Model Specification" June 2015, section [2]; and TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: – Model documentation" June 2015, section [3].

[941] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraphs [342]-[345].

network. Based on analysis by TERA, we used a "target" line fault index (LFI) of 9.9% to adjust opex associated with network maintenance. We applied a reduction to Chorus' actual maintenance costs in proportion to the ratio of Chorus' actual LFI to the target LFI.

1681. We then made a further adjustment to network opex, reflecting that we considered overall opex on fibre networks to be typically significantly lower than opex on copper networks. Based on analysis by TERA, we applied a 50% fibre opex adjustment, so that opex per line in the FTTH/FWA network was half the level of opex per line in the copper network.

Views of submitters and our current draft views

1682. Submissions on our approach to network opex in our December 2014 UCLL draft determination paper generally related to our use of Chorus' opex as our starting point, the size of both the LFI and fibre opex adjustments, and the joint application of these two efficiency adjustments. We discuss the issues raised, our responses, and our current draft views in respect of each of these issues in the sections below.

1683. We have also received submissions addressing more specific and technical details relating to our treatment of opex. We have discussed these with TERA. Responses to these points are set out in TERA's analysis of industry comments paper and have therefore not been included in this Attachment. We have reviewed this document and we agree with TERA's proposed responses to the submissions made. [942]

Use of Chorus' opex as our starting point

1684. Chorus supported the use of Chorus' operating costs as a starting point, and submitted that these costs provide the best available evidence of a nationwide fixed line telecommunications operator in New Zealand, regardless of the choice of MEA.[943]

1685. In contrast, WIK submitted that relying on the use of top-down accounting information on opex in a bottom-up cost model is particularly questionable, noting that opex from Chorus' copper network provides no information on the relevant costs of the MEA network.[944] As an alternative, WIK considered a mark-up on capital expenditure (capex) approach to be superior, with the mark-ups derived from

942 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access Services: – Analysis of the industry comments following the December 2014 draft determination" June 2015.

943 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [166].

944 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [140].

international benchmarks.[945] WIK submitted that this approach would provide a more coherent fit with our choice of MEA network.

1686. In response to WIK, Analysys Mason submitted that, contrary to WIK's contention that a mark-up approach will provide a better fit to the MEA, WIK's proposed approach would in fact result in benchmark networks being different from the network modelled.[946] Analysys Mason also noted that the mark-up on capex approach could have cost allocation issues if implemented crudely.

1687. We disagree with WIK. Consistent with our regulatory framework that evidential matters often drive our modelling decisions, we are of the view that Chorus' operating costs are the best objective evidence of opex for a nationwide telecommunications network provider in New Zealand. As we discuss further below, we also make adjustments to Chorus' opex data to better reflect the opex we consider would be incurred by the hypothetical efficient operator. We note in addition that international benchmarks applied under the mark-up on capex approach may not necessarily be representative of New Zealand circumstances.

Size of the LFI adjustment

1688. While not specifically commenting on the exact magnitude of the adjustment we applied to maintenance opex to reflect lower line fault rates, Analysys Mason submitted that the proportion of aerial deployment in the modelled network is higher than that for actual New Zealand telecommunications networks, and as a result the modelled maintenance opex should be increased.[947]

1689. Similarly, L1 Capital submitted that the amount of overhead versus underground deployment is a factor to consider in assessing the LFI adjustment, and line faults reported by New Zealand electricity distribution companies are higher than Chorus' due to a higher proportion of overhead infrastructure.[948]

1690. We agree with Analysys Mason and L1 Capital that, as a general principal, a higher proportion of aerial deployment can lead to a higher level of line faults and therefore higher network opex. Given that the modelled network of our hypothetical efficient operator has a higher proportion of overhead deployment relative to Chorus' network on which the opex is based, we agree that this would likely result in higher line faults on our modelled network.

1691. TERA has recommended that an adjustment to account for the higher proportion of aerial deployment, which would result in an increase in the target LFI from that used in our December 2014 UCLL draft determination paper.

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945 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [145].

946 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross submission" CONFIDENTIAL, 20 March 2015, section [4.1].

947 Ibid.

948 L1 Capital "Submission on draft UCLL and UBA pricing review determinations" 20 February 2015, p. 6.

1692. We have considered the analysis undertaken by TERA and we agree with the analysis undertaken and the results. Accordingly, our draft decision is to use a higher target LFI to adjust Chorus' maintenance opex to account for the higher proportion of aerial deployment in our modelled network. We consider that this is consistent with our regulatory framework in that we apply the best objective evidence to determine the appropriate parameter in this instance.

Size of the fibre opex adjustment

1693. As noted above, in our December 2014 UCLL draft determination paper we applied a 50% fibre opex adjustment, based on analysis by TERA regarding the difference in opex between copper and fibre networks.

1694. Submitters were generally critical of the single source of data on which the 50% figure was based. Analysys Mason noted that the 50% estimate was based on only a single data point, and it is "unsafe" to rely on a single source for such a large adjustment.[949] In cross submissions, Analysys Mason noted that the 50% figure was arbitrary and not supported by strong evidence.[950] WIK made a similar point, stating that the single source of the figure is "highly questionable".[951]

1695. Chorus and Analysys Mason both presented evidence from a number of different studies in regards to the percentage difference between fibre and copper opex, with Chorus concluding that a fibre opex adjustment in the range of 15%-30% would be more appropriate.[952,953,954]

1696. WIK disagreed with Analysys Mason's evidence, noting that the studies Analysys Mason assessed were either outdated or methodologically unclear.[955] Based on benchmarking the share of opex in our TSLRIC model with the share of opex in other

949 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 42.

950 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross submission" CONFIDENTIAL, 20 March 2015, section [4.2].

951 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [139].

952 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [176]-[179].

953 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 42-43.

954 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [179].

955 WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 19 March 2015, paragraph [94].

cost models, WIK submitted that the adjusted opex in the model from our December 2014 UCLL draft determination paper was not underestimated.[956]

1697. We agree with submitters that it is appropriate to consider a wider range of sources from which to determine a figure for the fibre opex adjustment. TERA has analysed a number of studies, and determined the appropriate fibre opex adjustment to be 40%.[957] We have considered the analysis undertaken by TERA and we agree with the analysis undertaken and the results. Our draft decision is therefore to apply a fibre opex adjustment of 40%. We consider that this is consistent with our regulatory framework in that we apply the best objective evidence to determine the appropriate parameter in this instance.

Application of the LFI and fibre opex adjustments

1698. In our December 2014 UCLL draft determination paper we first applied the LFI adjustment to reduce Chorus' maintenance opex, and then applied the fibre opex adjustment.

1699. Chorus submitted that the application of the LFI adjustment before the fibre adjustment results in double counting. Chorus' rationale is that the figure used for the fibre opex adjustment was based on the difference in opex between a legacy copper network, rather than a new copper network, and a fibre network.[958]

1700. Analysys Mason made the same point in its submission, noting that the LFI adjustment is intended to adjust maintenance costs derived from the old copper network to reflect maintenance costs of a modern equivalent copper network.[959] Analysys Mason submitted that there is no evidence to show that the figure for the 50% fibre adjustment was relative to a new copper network rather than an existing one. Analysys Mason submitted that, to avoid the risk of double counting, only a fibre adjustment should be applied, with no LFI adjustment.

1701. WIK critiqued the claims of Chorus and Analysys Mason in regards to double counting. WIK submitted that the LFI adjustment is a proxy approach to adjust from the old copper network that the data is derived from to a new copper network, and the fibre adjustment then adjusts from the opex of the new copper network to the

956 WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 19 March 2015, paragraph [95].

957 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services – Model documentation" June 2015, section [8.2].

958 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [174].

959 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 41.

opex of a new fibre network. WIK further submitted that it would be incorrect to only apply the fibre adjustment, as suggested by Analysys Mason.[960]

1702. We agree with Analysys Mason that there is no evidence to show that the figure for the 50% fibre adjustment (as was applied in the December 2014 UCLL draft determination paper) was based on adjusting the opex of a new copper network to a fibre network. However, it is equally unclear as to whether the figure is based on adjusting the opex of an old copper network to a fibre network. The same situation applies to the wider dataset that TERA has considered to determine the updated 40% fibre adjustment figure we now apply in our TSLRIC model.

1703. Nonetheless, we consider that the more likely interpretation of the figures from the various studies assessing copper opex relative to fibre opex is that they are based on opex for an old copper network. Accordingly, our draft decision is that the 40% fibre opex adjustment should be applied first, which is used as a proxy to adjust Chorus' opex so that it is more in line with the likely opex we would expect for the fibre network of our hypothetical efficient operator.

1704. We note, however, that we consider it is still appropriate to apply our LFI adjustment to Chorus' maintenance opex, and our draft decision is to apply this after having applied the 40% fibre opex adjustment. We consider that this provides an adjustment that appropriately takes into account the higher proportion of aerial deployment on the hypothetical efficient operator's network relative to Chorus' copper network.

[960] WIK-Consult "Cross submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access service and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 19 March 2015, paragraph [92].

Attachment N: Cost allocation

Purpose

1705. The purpose of this Attachment is to outline our draft decisions in regards to the allocation of forward-looking common costs in our TSLRIC model for the UCLL service. We discuss our earlier views in respect of the treatment of common cost allocation, views of submitters, and our subsequent analysis and draft decisions.

Our draft decision

1706. Our draft decision in regard to how we allocate forward-looking common costs in our TSLRIC model for the UCLL service is:

1706.1 For network costs, we use a capacity-based allocation approach, with specific allocation keys identified for different categories of network costs; and

1706.2 For non-network costs, we use the method of equi-proportional mark-up (EPMU).

1706.2.1 For the allocation of non-network costs between the regulated (UCLL and UBA) and non-regulated (co-location and ancillary charges) services, we use modified EPMU based on each service's share of revenue, as we do not have appropriate data to undertake a standard EPMU approach.

1706.2.2 For the allocation of non-network costs within the regulated services (UCLL and UBA), we use the standard EPMU approach based on each service's share of total attributable costs.

Defining network and non-network costs

1707. In our July 2014 Regulatory Framework and Modelling Approach paper we distinguished between:[961]

1707.1 costs directly attributable, which are those costs that can be wholly or solely associated with a single type of service; and

1707.2 costs not directly attributable, which are all other costs, ie, those that cannot be wholly or solely associated with a single type of service.

1708. In this Attachment we address costs that are not directly attributable.

1709. In our December 2014 UCLL draft determination paper we defined two cost categories within which we would consider how to allocate costs not directly

[961] Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [270].

attributable: network costs and non-network costs.[962] We also clarified our definition of these two cost categories.

1709.1 Network costs are costs associated with common network elements, such as exchange buildings. These include costs which are incurred in producing a given set of services (joint or shared costs), or all services (network common costs). These costs have a causal relationship with a group of, or all, services (rather than only a single service). For consistency with the terminology in our July 2014 Regulatory Framework and Modelling Approach paper and December 2014 UCLL draft determination paper, we will refer to these costs in this Attachment as "network costs", although it is important to bear in mind that it is only the joint and common network costs that are of concern for our cost allocation exercise.

1709.2 Non-network costs compromise corporate overheads, such as finance, human resources, legal and planning departments. They are also referred to as "non-network common costs". These are costs which are not directly incurred in providing network services, but are nonetheless required to operate a telecommunications company. These costs cannot be allocated in a non-arbitrary way to any particular service or services. For consistency with the terminology in our July 2014 Regulatory Framework and Modelling Approach paper and December 2014 UCLL draft determination paper, we will refer to these costs in this Attachment as "non-network costs".

Allocating network costs

Our choice of allocation approach

1710. In our July 2014 Regulatory Framework and Modelling Approach paper and December 2014 UCLL draft determination paper we discussed the choice of either a Shapley-Shubik approach or capacity-based approach to allocate network costs. Our draft decision in our December 2014 UCLL draft determination paper was to use a capacity-based approach, for the reasons set out below. [963, 964]

1710.1 A capacity-based allocation is often used in TSLRIC models, and therefore we considered it to be consistent with the objective in our December 2014 UCLL draft determination paper of giving greater weight to predictability of approach.

1710.2 A capacity-based allocation is a more transparent approach than the alternative Shapley-Shubik approach.

962 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [850].

963 Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [279].

964 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [851].

1710.3 Our expert advisor TERA supported the use of the capacity-based approach, and noted that this approach follows the cost drivers and allocates a proportionately larger share of network costs to services that have a proportionately greater network loading.[965]

1710.4 We also found it persuasive that all of the submitters agreed that we should implement a capacity-based allocation approach.

1711. In further submissions and cross submissions on our December 2014 UCLL draft determination paper, Chorus continued to support the use of a capacity-based approach rather than a Shapley-Shubik approach.[966] There were no further submissions on the choice of approach, and indeed it appears that this is not a particularly contentious issue.

1712. We remain of the view that we should use a capacity-based approach for the allocation of network costs, for similar reasons to those set out above. While we no longer place significant weight on an objective of predictability, we still think it is relevant to consider how regulators elsewhere implement TSLRIC models. Along with the greater transparency of the capacity-based approach (relative to Shapley-Shubik), the views expressed by TERA noted above (which continue to hold and with which we agree), we consider that this continues to support the use of a capacity-based approach. [967]

Implementation of the capacity-based allocation approach

1713. In the December 2014 UCLL draft determination paper we set out TERA's recommended approach to implementing the capacity-based allocation approach, which was to determine a capacity-based allocation key for different categories of network costs. We invited submissions on this approach.[968]

1714. We did not receive any submissions on this particular issue.

1715. We remain of the view that the implementation of the capacity-based allocation approach recommended by TERA is appropriate. A more complete description of this approach is discussed by TERA.[969] We consider that the capacity-based allocation keys determined by TERA are reasonable and provide a valid basis for allocating network costs. Consistent with our regulatory framework, we consider that the determination of appropriate allocation keys is largely an evidential matter, and we

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965 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Model Reference Paper" November 2014, section 4.1.1.

966 Chorus "Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 February 2015, paragraph [223].

967 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Model Reference Paper" June 2015, section [4.1.1].

968 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [859].

969 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: – Model Specification" June 2015, section [8.7.2.1].

consider that the allocation keys implemented by TERA provide the best objective way of allocating network costs.

Allocating non-network costs

Our choice of allocation approach

1716. In our December 2014 UCLL draft determination paper we set out our draft view that the method of EPMU was appropriate for the allocation of non-network costs. We noted that EPMU was a widely used methodology (which we considered was consistent with the objective in our December 2014 UCLL draft determination paper of predictability), was relatively simple to implement (compared to Ramsey-pricing as an alternative), was recommended by TERA, and that all submitters agreed that this was the preferable approach for the allocation of non-network costs.[970]

1717. In further submissions on our December 2014 UCLL draft determination paper, WIK re-iterated its support for the EPMU approach.[971] We did not receive any further submissions on the choice of EPMU for the allocation of non-network costs, and indeed it appears that this is not a particularly contentious issue.

1718. We remain of the view that we should use EPMU for the allocation of non-network costs, for similar reasons to those set out above. While we no longer place significant weight on an objective of predictability, we still think it is relevant to consider how regulators elsewhere implement TSLRIC models. Along with the relative simplicity of EPMU (relative to Ramsey-pricing), and the support for this approach by all submitters and our expert advisor, TERA, we consider that this continues to support the use of EPMU. [972]

Implementation of the EPMU allocation approach

1719. In our December 2014 UCLL draft determination paper we noted that EPMU is typically implemented using accounting cost data from the regulated firm's accounts.[973] However, based on our review of Chorus' financial accounts, we noted that a breakdown of costs by service was not necessarily always available.

1720. In the absence of a breakdown of costs by service, we proposed a proxy for the EPMU approach, where we allocated costs based on a breakdown of revenue by service (since the revenue breakdown was available in the financial accounts). That is, in the December 2014 UCLL draft determination paper we allocated a share of non-network common costs to each service in proportion to that service's share of revenue, which as noted above we refer to as modified EPMU. We applied the

970 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraphs [860-863].

971 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [400].

972 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Model Reference Paper" June 2015, section [4.1.2].

973 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [864].

modified EPMU approach to allocate costs between the regulated (UCLL and UBA) and non-regulated (co-location and ancillary charges) services.

1721. We note also that in allocating costs *within* the regulated services (UCLL and UBA), we did have available cost data from Chorus' financial accounts to implement EPMU. In this case, in our December 2014 UCLL draft determination paper we allocated a share of non-network common costs within the UCLL and UBA services in proportion to each service's share of opex.

1722. In submissions on this issue, Analysys Mason agreed that in the absence of data providing an appropriate cost breakdown by services, then modified EPMU is an appropriate methodology.[974]

1723. However, Analysys Mason's submission highlighted two critiques with this approach.[975]

1723.1 The approach used in our December 2014 UCLL draft determination paper was inconsistent, in that modified EPMU was used to allocate non-network costs between regulated and non-regulated services, but EPMU was used to allocate non-network costs between the UCLL and UBA services.

1723.2 Using opex to allocate non-network costs under the EPMU approach was unreliable, as the different services that costs are allocated to incur different capex to opex ratios. Other submitters made a similar point (including InternetNZ and WIK), noting that while we stated in our December 2014 UCLL draft determination paper that EPMU allocates costs based on total attributable costs, the actual implementation of EPMU in the TSLRIC model was based on opex, which is not the same as total attributable cost.[976,977]

1724. In cross submissions, Vodafone disagreed with Analysys Mason regarding the inconsistency in applying modified EPMU in one case and EPMU in another.[978] Vodafone submitted that if the second-best approach (ie, modified EPMU) is used in one area because of a lack of data, that does not necessarily imply it should be used for all other cost allocations. Vodafone submitted that, for the allocation of non-network costs within the UCLL and UBA services, an allocation based on EPMU using total attributable costs is appropriate.

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974 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 43.

975 Ibid.

976 InternetNZ, Consumer and TUANZ "Submission on draft UCLL and UBA price review determinations" 20 February 2015, paragraph [33].

977 WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL, 20 February 2015, paragraph [402].

978 Vodafone "Cross submission to the New Zealand Commerce Commission on submissions to the Process Paper and Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, paragraph [E3.2].

1725. We agree with Vodafone and do not consider that there is an inconsistency between applying modified EPMU in one instance and EPMU in another. We are of the view that an allocation approach based on EPMU is preferable where the data are available. We have only used modified EPMU as a proxy where the data are not available. Modified EPMU would not be an appropriate cost allocation approach to apply if the data were otherwise available to apply the standard EPMU approach (and this is the case for cost allocation within the UCLL and UBA services).

1726. As noted in the December 2014 UCLL draft determination paper, in the absence of data we consider that the modified EPMU approach is the best available proxy. The suitability of this approach as a proxy for EPMU relies on the assumption that revenue is distributed across services in similar proportions to total attributable costs. [979]

1727. Where this is not the case (which may be because the mark-up on costs is proportionately greater for some services than for others, for example, those services for which demand is relatively more inelastic), the modified EPMU approach has some similarities with the Ramsey-pricing approach. Under the modified EPMU allocation approach, relative to the standard EPMU approach, an access provider would only under-recover its costs of providing the service for which we set a regulated price if it were to earn a greater profit margin on unregulated services relative to regulated services.

1728. In regards to the point raised by submitters regarding the use of opex in the EPMU approach, rather than total attributable costs, we agree with submitters. We have, accordingly, based the allocation of non-network costs using the EPMU approach on total attributable costs, which reflect both capex and opex.

Avoiding double recovery in allocating costs between UCLL and UBA

1729. In our December 2014 UCLL draft determination paper we identified the potential for double recovery arising from the use of different MEAs for UCLL and UBA.[980] We noted that this is because the same trench and duct (between the active cabinet and the MDF) is covered more than once in the TSLRIC model for UBA and the TSLRIC model for UCLL.

1730. In our December 2014 UCLL draft determination paper we set out our proposed approach to addressing this double recovery, which is as follows.

1730.1 Calculate the potential double recovery as a result of the trench shared between UBA and UCLL.

[979] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [867].

[980] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [872].

1730.2 Allocate trench and duct costs between UBA and UCLL. The cost allocation is based on the capacity-based allocation approach. The capacity of the trench is the number of cables or ducts that can be installed in the trench.[981]

1730.3 UBA TSLRIC costs should be reduced by the UCLL share to avoid potential double recovery.

1731. We have received no further submissions on this particular issue, and we remain of the view that it is an appropriate way to address this particular source of potential double recovery.

[981] We used cable surface or duct surface when there are dedicated ducts to allocate the costs of.

Attachment O: Implementation of aggregation to allocate UCLL TSLRIC costs to UCLL and SLU services

Purpose

1732. This Attachment sets out the implementation of our aggregation approach, which is used to map costs to the UCLL and SLU services.

1733. As noted in Chapter 3, because our FTTH/FWA model does not include active cabinets, our model cannot directly determine UCLL and SLU costs. However, because we are required to update the UCLL and SLU STDs, we must find a way to determine prices for these services.

1734. As also explained in Chapter 3, our draft decision is to set the same price for access between the end-user and the exchange, irrespective of whether the line is cabinetised or non-cabinetised. We refer to this approach as aggregation, and it requires, in principle, that the price for UCLL = the price for SLU + for the proportion of the cost per line of UBA backhaul between the exchange and the cabinet. (We will refer to this as the “fibre feeder” hereon).[982] This formula is simultaneously solved with the average cost per line to connect all customers. So, the fibre feeder is solely used as an input to determine the relationship between UCLL and SLU.

1735. The formulae used in our model to implement the aggregation approach are set out in more detail in this attachment.

Formulae used in model to implement aggregation

1736. To implement our aggregation approach, we allocate the monthly TSLRIC unit costs for ULL to UCLL and to SLU respectively. We are using the demand for UCLL and SLU, as well as the monthly unit TSLRIC costs for fibre feeder, to determine the relationship between UCLL and SLU. Before we provide our formula, we first explain the inputs used to determine the relationship between UCLL and SLU.

1737. The inputs are as follows.

    1737.1 The TSLRIC model, which determines the monthly TSLRIC unit costs for full local loop and the fibre feeder;

    1737.2 The demand for the full local loop, which is the total number of current connections. This is the same as the demand profile set out in Attachment A – UCLL network footprint and demand; and

[982] We determine the annualised costs for the fibre feeder; ie, the cost for the UBA backhaul between the exchange and the cabinet, to allow us to allocate the cost of ULL between SLU and UCLL. In its cross submission, Wigley also stated that we treated cabinet fibre backhaul as SLUBH-but they are not the same. This definition should clarify this point. See Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraph [13.15].

1737.3 The demand for the fibre feeder, which is the number of UBA connections at an active cabinet.[983]

1738. We assume that demand for SLU is equal to demand for the fibre feeder. This assumption is supported by the fact that both services are used together in most cases.[984]

1739. We also apply the relationship that demand for UCLL is equal to the total demand for full local loop minus the demand for SLU.

1740. To implement aggregation, the cost per line should be the same whether or not the line is cabinetised:

$$UCLL = SLU + fibre\_feeder \tag{1}$$

1741. Our starting point is to calculate the average cost per line to connect all customers:

$$Cost\_per\_line_{unit} = \frac{C_{ull} + C_{fibre\_feeder}}{Demand_{ULL}} \tag{2}$$

Where

- **Cost_per_line$_{\mathbf{unit}}$** is the average cost per line to connect all customers
- **C$_{\mathbf{ull}}$** is the estimated monthly cost of the unbundled local loop from the TSLRIC model
- **C$_{\mathbf{fibre_feeder}}$** is the estimated monthly cost of the fibre feeder from the TSLRIC model
- **Demand$_{\mathbf{ULL}}$** is the demand profile for the full local loop

1742. Since, from the equation (1), the cost per line is the same whether or not the line is cabinetised, it follows from the equation (2) that the cost per line for UCLL is:

$$UCLL = \frac{C_{ull} + C_{fibre\_feeder}}{Demand_{ULL}} \tag{3}$$

1743. The cost per line for SLU backhaul is calculated as follows:

$$Fibre\_Feeder = \frac{C_{fibre\_feeder}}{Demand_{Fibre\_feeder}} \tag{4}$$

Where

- **Fibre Feeder** is the average cost per line for the fibre feeder
- **C$_{\mathbf{fibre_feeder}}$** is the estimated monthly cost of the fibre feeder from the TSLRIC model
- **Demand$_{\mathbf{fibre\ feeder}}$** is the demand profile for UBA connections at active cabinets

1744. Rearranging the equations above, the cost per line for SLU is therefore:

983 We use the term "demand" in respect of SLU backhaul loosely – it is not intended to imply the final demand for the SLU service, but rather refers more generally to the relevant measure of output over which the costs of SLU lines are recovered.

984 We are only aware of one case where the services are not used in a bundle, where an access seeker is unbundling at a cabinet but is providing its own backhaul.

$$SLU = UCLL - Fibre\_Feeder = \frac{C_{ull} + C_{fibre\_feeder}}{Demand_{ULL}} - \frac{C_{Fibre\_feeder}}{Demand_{Fibre\_feeder}} \qquad (5)$$

1745. It is this equation that is used in our model to determine the SLU cost, based on the inputs as discussed above.

Cross checks on our aggregation approach

1746. To test our aggregation approach, we considered cross checks for:

1746.1 efficient cost recovery; and

1746.2 relativity.

Efficient cost recovery

1747. To ensure that there is efficient cost recovery, we considered that estimated revenues across all of UCLL, SLU backhaul and SLU should be equal to the estimated TSLRIC cost of the full local loop.

1748. The estimated revenues across all of UCLL, SLU backhaul and SLUs can be represented as follows:

$$Demand_{UCLL} * UCLL + Demand_{Fibre\_feeder} * Fibre\_feeder + Demand_{fibre\_feeder} * SLU$$

1749. Substituting the cost per line for UCLL (equation 3), SLUBH (equation 4) and SLU (equation 5) in the equation immediately above, and simplifying, results the modelled TSLRIC cost of the unbundled local loop plus the modelled TSLRIC cost of fibre feeder, which is equivalent to the cost of the full local loop. It is therefore the case that estimated revenue across UCLL, fibre feeder and SLU does equal the estimated cost of the full local loop, and thus our aggregation approach meets our efficient cost recovery test.

Relativity

1750. To ensure that our aggregation approach provides uniform incentives for unbundling between cabinetised and non-cabinetised lines, we estimated the costs that an efficient operator, almost as efficient as our hypothetical efficient network operator, would incur in purchasing a wholesale UBA product in comparison to unbundling and sub-loop unbundling.

1751. Based on the further draft prices, we found that:

1751.1 the cost for an unbundler is similar, whether they are unbundling a non-cabinetised line or a cabinetised line; and

1751.2 UBA additional costs are aggregated and this means that the relativity (or economic space) is similar for unbundlers and sub-loop unbundlers.

1752. This shows that our aggregation approach provides uniform incentives to unbundle. For example, an efficient operator, almost as efficient as our hypothetical efficient network operator, would face a similar cost in unbundling a cabinetised line compared to unbundling a non-cabinetised line, and this is similar to the cost of a wholesale UBA product.

1753. Accordingly, our view is that the relativity requirement is met by our aggregation approach.

Attachment P: A technical description of how backdating would be applied, if we were to backdate

Purpose and overview of this Attachment

1754. As noted in Chapter 6 we have sought to estimate the potential backdating amount and magnitude of various implementation options. This Attachment sets out the implementation considerations and how the backdating amounts are likely to be calculated if we were to decide to backdate.

1755. We are also providing our proposed backdating model to help interested parties to replicate our results and understand how backdating could apply to them if we were to decide to backdate. As noted in Chapter 6, we invite submissions on our proposed backdating model. In particular, we invite parties to:

1755.1 calculate their own backdating amounts, and corresponding lump sum payments;

1755.2 calculate an aggregate backdating amount and associated claw-back to the final price; and

1755.3 comment on the appropriateness of the proposed model.

Objective of our proposed backdating model

1756. The objective of our model is:

1756.1 To estimate the potential backdating amount, if we were to backdate, based on different backdating time periods for regulated services and commercial services that are linked to regulated services.

1756.2 To assess different implementation options based on a particular decision to backdate, if we were to decide to backdate. The different implementation options that we consider in the model are explained in more detail in this Attachment.

1757. Having these estimates will help us to assess the section 18 implications of any backdating decision.

How are the backdating amounts likely to be calculated?

1758. Table 17 below provides our estimate of the likely backdating amounts involved, if we were to backdate.

Table 17: Estimated backdating amounts, if we were to decide to backdate (millions)

	1 Dec 14 effective date for backdating		1 Dec 12 effective date for backdating	
Service	**STD services only**	**STD and commercial services**	**STD services only**	**STD and commercial services**
UBA	1.23	[ ]CCNZCI	1.23	[ ] CCNZCI
UCLF	0.00	[ ] CCNZCI	0.00	[ ] CCNZCI
UCLL	41.70	[ ] CCNZCI	96.35	[ ] CCNZCI
SLU	0.13	[ ] CCNZCI	0.05	[ ] CCNZCI
Total	**42.80**	**[ ]** CCNZCI	**97.63**	**[ ]** CCNZCI

Source: Commission's draft backdating model

Note: The figures in italics in this table reflects a payment from Chorus to RSPs, otherwise the figures represent a payment from RSPs to Chorus

1759. The estimated backdating amounts in Table 17 are based on the following:

1759.1 The backdating amounts, in the first two columns are based on the backdating period, if the start date of the backdating period is 1 December 2014.[985]

1759.2 The backdating amounts, in the last two columns are based on the backdating period, if the start date of the backdating period is 1 December 2012.

1759.3 The backdating amounts include both recurring and non-recurring charges for the following regulated services in our calculations: UBA, UCLL, UCLFS and SLU (**STD services only**). In addition to these regulated services we have also included services sold that are contractually linked to the regulated services through some component of pricing (**commercial services**).[986]

1760. The backdating amount is likely to be calculated as the difference between the final FPP price and the IPP price, ie, the price delta, multiplied by the relevant volumes. We explain below, how we propose to calculate the price delta and forecast the relevant volumes and the proposed interest rate used in our calculations.

Price delta

1761. In order to calculate the backdating amount in nominal terms we need to calculate the difference between the final TSLRIC price and IPP price, ie, price delta.

1762. We have used the price cap as the price level as we have no evidence indicating that Chorus has been providing regulated services below the price cap. We requested

[986] These have been included to assess the indirect effects on RSPs and Chorus that would be caused by backdating the regulated services. Furthermore, because these services are not directly regulated, they might be subject to different implementation methods.

data from Chorus, and based on our analysis it appears that only price caps were applied during any of the backdating periods.

1763. Contractually linked prices are assumed to move one-for-one with regulated prices. We note that it will be up to the parties to resolve any disputes which may arise in this context.

1764. Our modelling includes the IPP prices for each year after 1 December 2012 which accounts for sundry price revisions, the change from retail-minus to IPP prices for UBA and the change in cost recovery from the UCLFS MPF to the UCLL MPF.

1765. As explained in Chapter 6, to illustrate the effect of backdating, we would use the TSLRIC price set in year 1. As explained in Chapter 3, our TSLRIC model uses network costs that were collected in 2014. If we were to backdate, we would use the prices in year 1 of our TSLRIC model as the prices for the backdated period.

1766. In our modelling, we have used prices based on a 2015 WACC (ie, 6.03%). We note that this WACC number would be adjusted based on the approach explained above, if we were to backdate. These prices are emphasised in the table below:

Table 18: Illustration of prices used to estimate the backdating amount

Prices	2015	2016	2017	2018	2019	2020
UCLL						
WACC of 6.26% (price for backdating)	**26.89**					
WACC of 6.03%	26.31	**26.74**	**27.18**	**27.63**	**28.09**	**28.56**
UBA						
WACC of 6.26% (price for backdating)	**11.45**					
WACC of 6.03%	11.35	**11.15**	**10.97**	**10.80**	**10.65**	**10.52**
Total UBA						
WACC of 6.26% (price for backdating)	**38.34**					
WACC of 6.03%	37.66	**37.89**	**38.15**	**38.43**	**38.74**	**39.08**

Forecasting volumes

1767. At this stage our data covers the period from 1 December 2012 to 30 November 2014. In order to estimate the backdating amount we need to forecast the volumes for each charge to 1 December 2015.

1768. We have used a six month average to predict the trend for each month from 1 December 2014 to 1 December 2015. There are multiple methods for forecasting. Some, like econometric based forecasts could be more accurate in the long-term but are too complicated to implement given the number of charges. Others, like a constant based on the last month's data are simple and rely on more recent data but will be less accurate for non-recurring charges and low volume charges, which can be sporadic.

1769. A six month average provides a balance to help forecast high and low volume charges over a one year period.

1770. The volumes used in our model were provided by Chorus and Spark.[987] We have adjusted the data to fit the STD price structure. The data that we have used was sourced from internal systems prior to 1 December 2014 and do not necessarily reflect the structure of the STD.[988]

What is the interest rate for our backdating estimate?

1771. We considered the question of whether we should use WACC or the pre-tax cost of debt for the interest rate.

1772. If we were to backdate, our further draft decision is to use the pre-tax cost of debt as the interest rate for the backdating model, following the precedent from our approach to claw-back under Part 4 of the Commerce Act. The pre-tax cost of debt was used to calculate the present value of any claw-back amounts in the November 2012 DPP reset (and subsequently in the November 2013 Orion CPP decision, and the November 2014 DPP reset).

1773. Backdating and claw-back are conceptually very similar. In both cases, there has been a past under- or over- recovery by the regulated supplier. Backdating (under the Telecommunications Act) and claw-back (under Part 4 of the Commerce Act) are the mechanisms to provide compensation for the past under- or over- recovery.[989]

1774. Although backdating and claw-back may be implemented differently, reflecting the requirements of the Telecommunications Act and the Commerce Act respectively, in principle this should not affect the appropriate interest rate used when calculating the *amount* of any past under- or over-recovery.

1775. In the November 2012 DPP reset decision we explained that the pre-tax cost of debt is a more appropriate interest rate than the cost of capital because:[990]

> …the cost of capital reflects the cost of equity, which in turn reflects exposure to systematic risk. However, there is no systematic risk associated with the recovery of claw-back amounts. Conversely, a risk free rate would also have been inappropriate as the amounts are not risk free, and a risk free rate does not reflect the opportunity cost of borrowing for suppliers and consumers.

[987] Section 98 Notices, dated 5 February 2015.

[988] An example of this is UBA new connections which separate wiring and modem installations post 1 December 2014 but included them previously.

[989] Our view is that claw-back is a mechanism providing compensation through future prices, while backdating is mechanism providing compensation through either future prices, lump-sum payment(s) or a combination of both

[990] Commerce Commission "Resetting the 2010-15 Default Price-Quality Paths for 16 Electricity Distributors" 30 November 2012, p. 149, paragraph [J30].

1776. Our current view is that the same rationale applies for backdating in the context of the UCLL and UBA FPP pricing reviews:

1776.1 The value of any under- or over-recovery is based on *past* prices and volumes, so is not subject to systematic risk.

1776.2 The pre-tax cost of debt provides a reasonable approximation of the opportunity cost of funds for both Chorus and RSPs.[991] This is relevant because any past under- or over- recovery of charges is akin to a loan between Chorus and RSPs.

1777. Therefore, the pre-tax cost of debt should be used as the interest rate in the backdating model. In our model we have used the cost of debt estimate of 5.88% used in the WACC estimate as at 1 December 2014.[992]

How the backdating amount would be recovered, if we were to backdate

1778. As explained in Chapter 6, we have considered the following implications for backdating, if we were to backdate:

1778.1 once off lump sum payment paid shortly after our final determination;

1778.2 pre-determined lump sum payments paid over a certain period; and

1778.3 a uniform claw-back to the final FPP price.

1779. In Chapter 6, we also explain that a mixed or composite approach of a lump sum payment and a uniform claw-back to the final price would best give effect to the section 18 purpose statement.

1780. In the subsequent paragraphs, we provide the likely results of the implementation options for each STD service, based on a backdating start date of 1 December 2014.[993] We also provide the formulae used in our proposed backdating model to determine the indicative results for the implementation options.

Lump sum repayments

1781. Our starting point to determine the size of the backdating amount is a present value lump sum payment as at December 2015.

1782. In this case, the lump sum payments are calculated for each charge by multiplying volumes by the price delta. These are then converted to present value terms and

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[991] We note that the debt premium on bonds issued by Spark was considered when determining the cost of debt for the FPPs, and when determining the cost of debt as part of our regular WACC determinations for businesses regulated under Part 4 of the Commerce Act.

[992] Please refer "Cost of capital for the UCLL and UBA pricing reviews: WACC spreadsheet for the further draft determination" 2 July 2015.

[993] Our model also considers the backdating period if no backdating were to apply, and a backdating period with a start date of 1 December 2012.

summed across the backdating period and across charges to get an amount for each service.

1783. The lump sum amount is not adjusted to include a provision for smaller RSPs as explained in Chapter 6.

1784. The proposed formula is: [994]

$$BD_{t,c} = Q_{t,c} x \left(P_{draft,c} - P_{IPP,c}\right)$$

$$L_s = \sum_{t,c} \left(BD_{t,c}\, x\, \left(1 + \frac{r}{12}\right)^n\right)$$

Where:

t are months in the backdating period

s are regulated services UBA, UCLL, UCLFS and SLU

c are charges in the UBA, UCLL, SLU and UCLF STDs

BD_c is the nominal lump sum for a given charge and month

$Q_{t,c}$ is the volume of charge c during month t

$P_{draft,c}$ is the further draft price for charge c

$P_{IPP,c}$ is the IPP price for charge c

r is the cost of debt

n is the number of months from the date of the final determination

L_s is the present value lump sum of the backdating amount for a service

1785. Table 19 below provides the indicative results for lump sum payments for each regulated service.

Table 19: Indicative results for total lump sum payments considered in our proposed backdating model (millions, 1 Dec 2014 start date)

	UBA	UCLL	SLU
Lump sum payments	1.23	41.70	***0.13***

Source: Commission's draft backdating model

*Note: The figures in **italics** in this table reflects a payment from Chorus to RSPs, otherwise the figures represent a payment from RSPs to Chorus*

1786. The results in Table 19 are based on the following:

1786.1 The results are based on the backdating period, if the start date of the backdating period is 1 December 2014;

[994] We note that in our model $\frac{r}{12}$ is an approximation of: $(1+r)^{r/12} - 1$

1786.2 The possible magnitude of our implementation options is calculated based on regulated services only. Any commercial services were excluded from implementation considerations because, we as a regulator, do not have control over any commercial services; and

1786.3 The results include both recurring and non-recurring charges for the regulated services.

Smoothed payments

1787. Our proposed model uses two scenarios to test the effect of smoothed payments over a certain period. Our model uses a:

1787.1 5 year period;

1787.2 12 month period.

1788. For a 5 year smoothed payments, to estimate how the lump sum amount for each service could be recovered over the regulatory period we have calculated the fixed annuity over the 5 year period.

1789. The proposed formula is:

$$V_S = PMT(r, 5, L_S)$$

Where:

V_S is the annuity amount for a service

r is the cost of debt

$PMT(.)$ is the PMT function in Microsoft Excel

L_S is the present value lump sum of the backdating amount for a service

1790. For a 12 month period, to estimate how the lump sum amount for each service could be recovered monthly over a 1 year period we have calculated a 12 month fixed annuity.

1791. The proposed formula is:

$$V_S = PMT\left(\frac{r}{12}, 12, L_S\right)$$

Where:

V_S is the annuity amount for a service

r is the cost of debt

$PMT(.)$ is the PMT function in Microsoft Excel

L_S is the present value lump sum of the backdating amount for a service

1792. Table 20 below provides the indicate results for smoothed lump sum payments for each regulated service.

Table 20: Indicative results smoothed lump sum payments considered in our proposed backdating model (millions, 1 Dec 2014 start date)

	UBA	UCLL	SLU
Smoothed payments over 5 years ($/year)	0.29	9.72	***0.03***
Smoothed payments over 12 months ($/month)	0.11	3.58	***0.01***

Source: Commission's draft backdating model

Note: The figures in ***italics*** *in this table reflects a payment from Chorus to RSPs, otherwise the figures represent a payment from RSPs to Chorus*

1793. The results in Table 20 are based on the following:

1793.1 The results are based on the backdating period, if the start date of the backdating period is 1 December 2014;

1793.2 The possible magnitude of our implementation options is calculated based on regulated services only; and

1793.3 The results include both recurring and non-recurring charges for the regulated services.

Claw-back for each service over the remaining regulatory period

1794. We have also estimated the claw-back that could be applied to each service in order to recover the backdating amount.

1795. In this case, if backdating were to apply from 1 December 2014 the claw-back is applied to prices over the remainder of the regulatory period ie, 4 years from 1 December 2015.

1796. To calculate the claw-back we have used the monthly annuity over the period. This is then divided this by the forecast volume of lines for the core recurring charges. The volume of lines has been kept constant due to the uncertainty inherent in forecasting volumes over 4 years.

1797. The proposed formula is:

$$M_s = PMT(\frac{r}{12}, 48, L_s)/Q_{Dec\ 2015,s}$$

Where:

M_s is the claw-back for a service ($/month/line)

r is the cost of debt

$PMT(.)$ is the PMT function in Microsoft Excel
L_s is the present value lump sum of the backdating amount for a service
$Q_{Dec\ 2015,s}$ is the volume of lines for the core recurring charges for a service

1798. Table 21 below provide the indicate results for a likely claw-back to the TSLRIC FPP price for each regulated service.

Table 21: Indicative results for a likely claw-back to the TSLRIC FPP price considered in our proposed backdating model (1 Dec 2014 start date)

	UBA	UCLL	SLU
Claw-back added to the final price ($/month/line)	0.03	0.77	*0.82*

Source: Commission's draft backdating model

Note: The figures in ***italics*** *in this table reflects a drop in the TSLRIC FPP price*

1799. The results in Table 21 are based on the following:

1799.1 The results are based on the backdating period, if the start date of the backdating period is 1 December 2014;

1799.2 The possible magnitude of our implementation options is calculated based on regulated services only; and

1799.3 The results include both recurring and non-recurring charges for the regulated services.

Composite approach

1800. In the composite approach is an approach where we propose to recover the backdating amount based on two mechanisms, namely a lump sum payment and a claw-back on the TSLRIC prices is used. This approach is explained and illustrated in Chapter 6 of this further draft determination, and illustrated below.

1801. We will use the same formulae above to determine the lump sum payments (see paragraph 1791 above) and claw-back to the TSLRIC prices (see paragraph 1797 above). The split will be based on the amount we believe RSPs have made a provision for backdating.

Box 1: Illustration of a composite approach

- Assume the total UBA price is backdated from 1 December 2015 to 1 December 2014, and the IPP price that applies from 1 December 2014 is $34.
- If the total UBA price is $38 in our final determination, the increase in the price from the IPP price is approximately $4. If, based on our judgement, RSPs made a provision of $4, the implementation would only be a lump sum payment because the price change equates recent prices by most RSPs.

- If the total UBA price increases to $39 in our final determination, the increase in the price from the IPP price is approximately $5. If, based on our judgement, RSPs made a provision of $4, then the implementation would be a lump sum payment based on the $4, and the balance of $1, would be recovered based on a claw-back on the final TSLRIC price over the remainder of the regulatory period. Based on our backdating model, this amounts to approximately $0.30, if we were to backdate to 1 December 2014. (ie, 4 years from 1 December 2015 to 1 December 2019)

- Some RSPs indicated that retail prices were increased by $4 to make a provision for backdating. If the available evidence shows that RSPs increased retail prices by this magnitude, the difference between our further draft total UBA price in year 1 and the IPP price almost equate the provision made by RSPs. For this reason, backdating implementation would mainly be a lump sum payment if the further draft prices were to apply as the final prices determined in our final determination.

- If we backdate then the backdating implementation relating to the UBA increment and the UCLL price could be calculated separately but the same method would apply to each service.

Attachment Q: International Comparators

Purpose

1802. Spark has provided a comparison of the further draft UCLL prices with international benchmarks and submitted:[995]

> These facts, and the magnitude of the divergence from past estimates and overseas prices – which would have the effect of transferring between $500 million and $1.5 billion dollars from New Zealand end-users to Chorus over the course of the next five years – should have been sufficient to cause the Commission to delve more deeply than it has into the reasons for this divergence and to think more carefully about making the number of decision it has to favour predictability and investment incentives over lower prices. Surprisingly the draft determinations do not comment on or explore the significant divergence from previous pricing estimates, and international experience.

1803. Spark also noted our draft decisions could make "…Chorus charges 80% higher per line than comparable countries".[996]

1804. This Attachment examines what information, if any, we can draw upon in determining the further draft UCLL prices from international comparators including those provided by Spark. It also considers other comparators provided as part of our previous IPP processes.

1805. We have asked whether the evidence provided by other regulators' price determinations is indicative that our FPP model is producing cost estimates outside of what is reasonable and have found that it does not.

1806. We have requested TERA examine the New Zealand model against other regulatory decisions for which public information is available.[997] These comparators are Ireland, France, Denmark and Sweden.[998] TERA has advised us the main factors driving different costs for New Zealand are the spatial dispersion of end-users driving a higher network length per line and, for comparison with Sweden and Denmark, higher trenching costs. In effect, customers in New Zealand tend to be more spread out and thus it costs more to provide the infrastructure to reach them. Even for Sweden which, on a national basis, has a similar population density to New Zealand, population is not so dispersed there.[999] TERA has found that the network length per line is 64.3 metres for New Zealand compared to 41.2 for France, 51.2 for Sweden

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995 Spark "UBA and UCLL FPP pricing review draft decision submission" paragraph [14], p. 9. Several other submitters have also referred to this comparison for example Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations", 20 March 2015, paragraph1.1(a), and Vodafone New Zealand Limited, "Cross Submission to the New Zealand Commerce Commission", 20 March 2015, paragraph (v). Chorus has submitted this evidence should be rejected (see Chorus" Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services", 20 March 2015, paragraph 5).

996 www.becountred.org.nz, last accessed 9 June 2015.

997 See TERA, "International comparison of TSLRIC UCLL and UBA costs and prices", June 2015.

998 While the French regulator does not use a TSLRIC model to set prices and, consequently, the regulated price is not comparable to our TSLRIC estimate, there is a TSLRIC model available for France.

999 The intuitive story for this is Sweden has large areas where no one lives.

and 55 for Denmark. For trenching costs, we have sought and received local civil engineering experts, Beca, for advice on the expected costs for New Zealand.[1000]

The role of international comparators in the FPP

1807. The FPP is an important part of the regulatory framework for telecommunication price determinations. Prices are first determined under the IPP methodology of international comparators. Parties have the option to require a full model be produced under the FPP under section 42 of the Act. As explained in the "Introduction and Process" part of the further draft determination, we received five applications for a pricing review determination of the prices we set for the UCLL service in accordance with the FPP.

1808. In this context, the role of international comparators for FPPs is much reduced.[1001] We believe that concerns with the accuracy of the comparators used in the IPP methodology are likely to lead to an FPP.[1002] This accuracy of the IPP process is highlighted in the case of the UCLL price, where the last re-benchmarking process found only one comparable country, Sweden. Consequently, alternatives to our previous benchmarking methodology had to be used to make best use of the data available in order to determine a price.

1809. We have, nonetheless, examined the evidence provided by Spark in this context and other data readily available from our previous IPP exercises. Essentially we have asked whether the evidence provided by other regulators' price determinations is indicative that our FPP model is producing cost estimates outside of what is reasonable and have found that it does not.

The Spark dataset

1810. We note that several of the countries contained in this dataset were ruled out under our IPP process because they do not use a forward-looking cost-based methodology. Others were considered non-comparable because their country characteristics lie outside a range considered to be comparable to New Zealand.

1811. Countries that do not use a forward-looking cost-based methodology are non-comparable to our FPP further draft prices. This is because the FPP for the UCLL

[1000] While the modelled average trenching costs are higher in New Zealand (85) than Sweden (52) or Denmark (34), New Zealand trenching costs are lower than for France (88).

[1001] Chorus has made a similar point in its cross submission (Chorus "Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services", 20 March 2015, paragraph 5.

[1002] There may be specific parameters which can be guided by international comparators. For example where a cost input is traded internationally or is otherwise unlikely to vary between countries; international comparators can be a good guide as to the likely cost in New Zealand. For example asset lives and certain price trends can draw upon international comparators as a guide for what is likely to occur in New Zealand.

service is TSLRIC (and not some alternative methodology).[1003] Countries that do not use forward-looking cost methodology are disregarded.[1004]

1812. For countries where we have previously found they are not comparable because of their country characteristics we have left in this dataset. We have considered what, if anything, these countries can tell us.[1005]

The Commission's previous experience with international benchmarks of UCLL

1813. We have twice determined the UCLL price based on international comparators under the IPP methodology.

1814. When we first determined the UCLL price under the IPP in 2007 we had a large database of comparators, including the US states. We found that the prices determined by US states were significantly higher than other regulators around the world. In practice the list of comparable benchmarks used to set the IPP price in 2007 included US states and other countries from the rest of the world.

1815. When we last determined the UCLL price under the IPP in 2012, we found only one country, Sweden, was comparable. Given the concerns of basing prices on a single benchmark we explored what other options could be used. This concern was compounded by the loss of US comparators.[1006] Two practical responses were found.

1815.1 We could expand the benchmark set by benchmarking changes in price since 2007. This indicated a price reduction of 2.11% that could be applied to the 2007 price to determine an updated price.

1815.2 We could adjust non-comparable benchmarks to adjust them by observed econometric relationships between price and country characteristics. This could also adjust the price to the difference observed in 2007 between the US States and other countries.[1007]

1816. The 2012 re-benchmarking process made use of both of these methodologies to determine the price. In doing so it set an IPP price above all the raw benchmarks, which reflects the key issues of the loss of the US dataset and lack of comparators. This also highlights the main problem with the Spark dataset.

1003 We are required under the Act to form our own opinion of what is "in accordance with" the FPP.

1004 These countries are Austria, France, Netherlands, Portugal and Spain.

1005 Our 2007 methodology used Teledensity, Population Density and Urbanisation as comparable characteristics.

1006 We found in our last benchmarking exercise that the US State prices had not been updated and therefore no longer represented forward-looking costs. See Commerce Commission, Decision No. NZCC 37, paragraphs [101 to 107].

1007 In 2007 we noted, "The expected New Zealand UCLL rate ranges from $21.13 where the US dummy is set to 0 (i.e. New Zealand is considered to be more similar to the non-US jurisdictions, where 'similarity' is based on factors other than the cost drivers used in the regression) and $28.34 where the US dummy is set to 1 (i.e. New Zealand is considered to be more like the US)." Commerce Commission, Decision 609, paragraph [187].

1817. We can derive two alternative forward-looking cost-based datasets to lie alongside the Spark dataset.

1817.1 The 2012 benchmark set which was rejected under the IPP as non-comparable including using the econometrically adjusted data we published alongside the determination in 2012.

1817.2 The comparable benchmark set used to determine the prices in 2007 which can be adjusted by the 2.11% price trend found in the 2012 benchmarking process.

What do these data sets tell us?

1818. The UCLL further draft prices lie within the range of evidence on international comparators we have before us. We believe all three datasets we examine below have significant limitations and dangers in using as a cross-check on the FPP modelling. Below we examine:

1818.1 the evidence provided by Spark, which is indicative of the further draft prices being high for UCLL;

1818.2 what further information we gain from the 2012 IPP exercise and dataset, which is indicative of the problems inherent in the Spark dataset; and

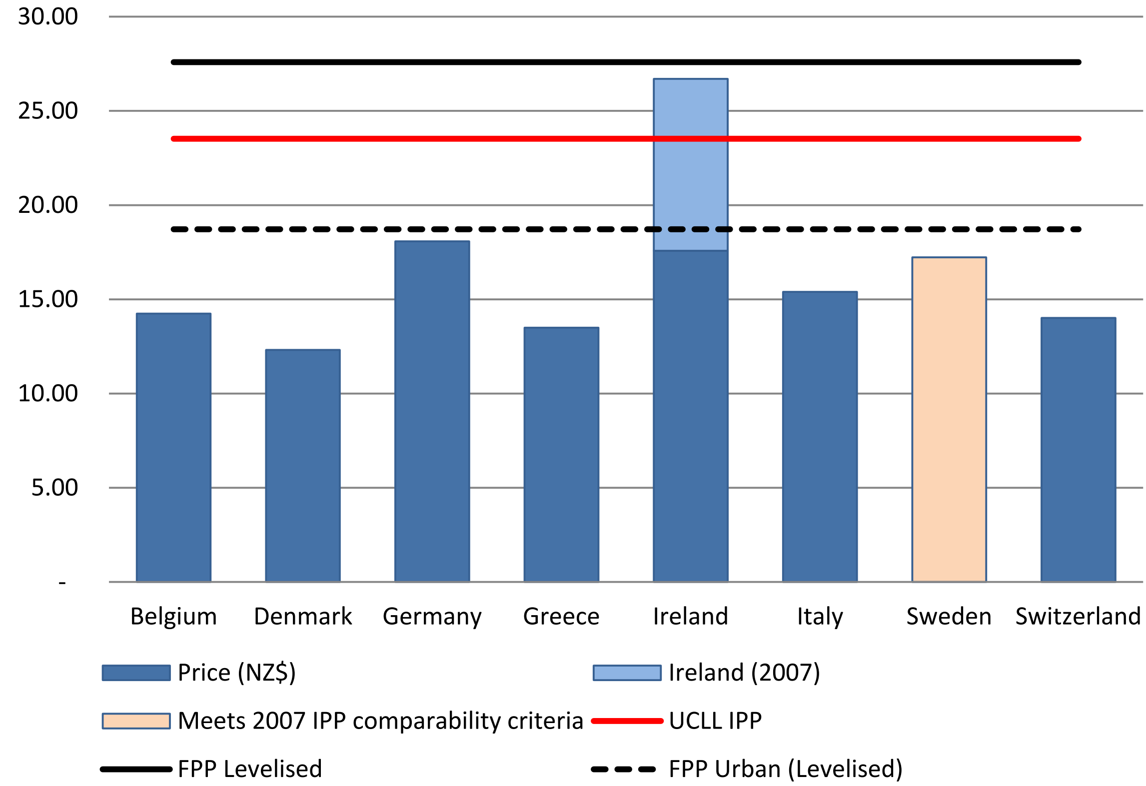
1818.3 the 2007 dataset which illustrates the issues raised of international comparators which exclude US data.

What can we draw from the Spark dataset?

1819. If we distil the Spark dataset down to countries that use a TSLRIC methodology we can see our further draft prices are higher than the range of this dataset. This is illustrated in the chart below.[1008]

[1008] We have also excluded the EU 28 price. As an average it contains little information on the likely boundaries of prices which are reasonable as a cross-check for the purposes of the FPP.

Figure 3: Spark Refined Data Set



1820. The Spark dataset has updated the regulators' prices since the 2012 IPP exercise.[1009]

1821. The Spark dataset is purely European prices, but we can note that these can be strongly driven by the approach of individual regulators. For example we understand that the Irish Regulator's price for UCLL is highly weighted to only the largest exchanges and may, therefore, be more comparable to the New Zealand urban price.[1010] Within the chart we have included the Irish price set in 2007 when, we understand, such a methodology was not employed.[1011] Accepting the limitations in using a 2007 price and non-comparable country as a comparator (or any single data point), we can note that Ireland (unlike Sweden) is similar to our modelled FPP urban price and its 2007 price is close to our modelled FPP geographic average price.[1012] TERA has advised us that on a comparative basis, the Irish UCLL price is likely to be higher than the current further draft modelled prices for New Zealand.[1013]

1009 The Spark dataset is smaller than the dataset used in the 2012 benchmarking process.

1010 In 2009 the Irish Regulator ComReg changed its methodology used to calculate the UCLL charges, the revised methodology gave significantly more weight to the largest (and least expensive) exchanges. See Commission for Communications Regulation, Local Loop Unbundling ("LLU") and Sub Loop Unbundling ("SLU") Maximum Monthly Rental Charges, February 2010.

1011 This is only illustrative of how a change in methodology can affect the results, the 2007 benchmarks are examined in more detail later in this Attachment.

1012 It should be noted that Ireland has never been considered a comparable country to New Zealand under our IPP methodology. There remains material issues in comparing the Irish price, for example Ireland has a separate monthly fault rental charge and services include the ETP.

1013 See TERA, "International comparison of TSLRIC UCLL and UBA costs and prices", June 2015, Table 4.

1822. The 2012 IPP price, which was based on international benchmarking, also exceeds the prices in the Spark dataset. In our full examination of comparators in 2012 we concluded, nonetheless, that there were significant problems with the available data which undermined its value as a guide to forward-looking costs in New Zealand. Using this now to guide the FPP modelling would undermine the value of the FPP modelling, which has been requested in response to the IPP price.

What does the 2012 IPP process and data tell us?

1823. The 2012 process identified two problems with the international benchmark set, which equally applies to the Spark dataset:

1823.1 the loss of the US State comparators which were noticeable higher than other regulators. There was no information to indicate whether forward-looking costs in New Zealand were more akin to US States or elsewhere; and

1823.2 only Sweden had country characteristics that were comparable to New Zealand. This is indicative that the other countries could exhibit significant cost differences to what we would expect in New Zealand.

1824. The Commission concluded in 2012 that:[1014]

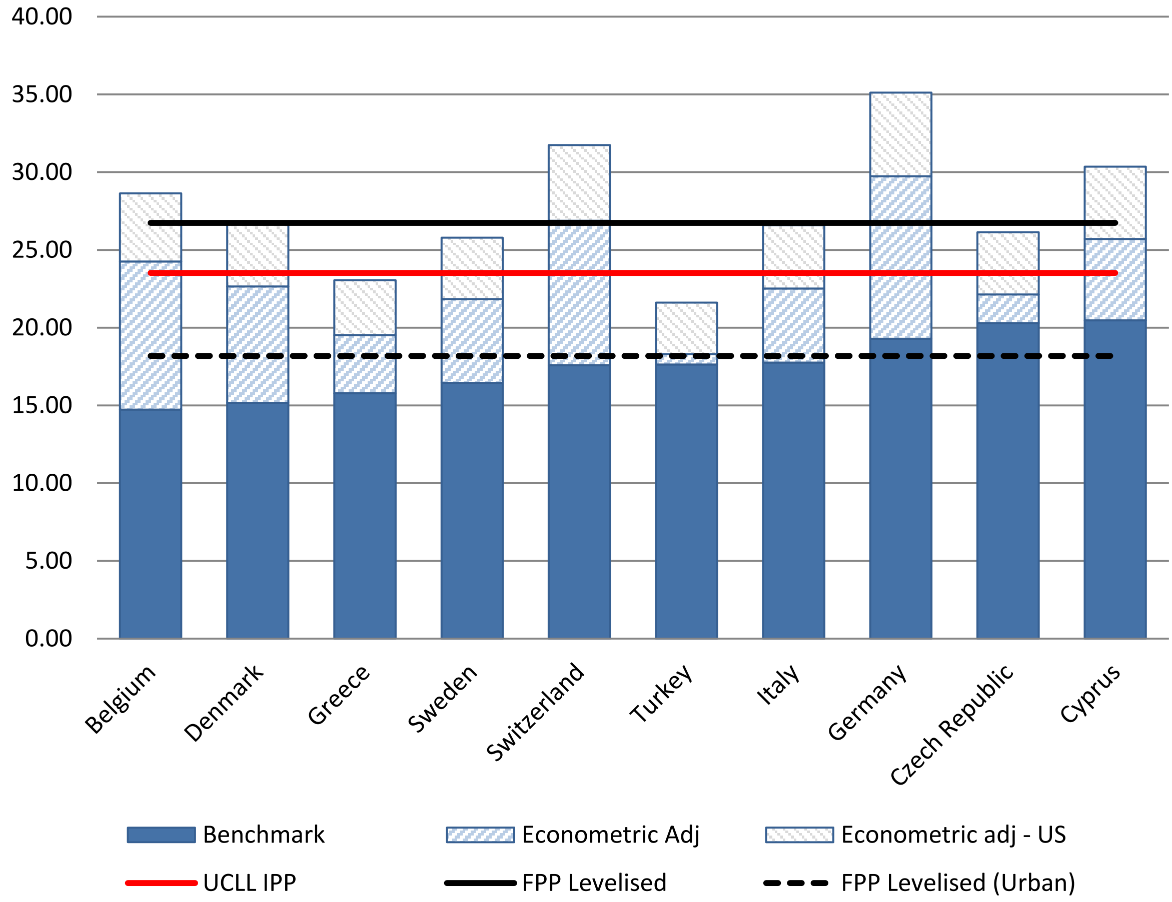
> Due to the inclusion of high density countries and the exclusion of US states, the Commission considers that the raw benchmarking approach results in a benchmark set that is biased downwards. The outcome under this the raw benchmarking approach is a nominal reduction in the UCLL monthly rental price of approximately 30%. The 30% reduction is driven by the inclusion of countries in the benchmark set that did not meet the comparability criteria in the 2007 UCLL STD and the exclusion of US states.

1825. To illustrate these two points we can use the IPP methodology of "econometrically adjusting" the dataset to be more representative of New Zealand and more representative of US states.[1015] This is illustrated in the chart below.

[1014] Commerce Commission, Decision No. NZCC 37, paragraphs [132.1] and [132.2].

[1015] For detail on this approach see Commerce Commission, Decision No. NZCC 37, Attachment D. For the resulting prices see Determination of the UCLL Benchmarking Review Spreadsheet, December 2012. In the above chart the column labelled Econometric Adj, partially adjusts to be representative of US States whereas Econometric Adj – US, fully adjusts to be representative of US States. If the dataset is to be viewed as the possible range of plausible outcomes, it is the latter which is more informative. However, as we note elsewhere, there are significant limitations of all these datasets in achieving that outcome as a cross-check.

Figure 4: 2012 Dataset Econometrically Adjusted



1826. As can be seen, under this modified dataset, the further draft prices lie within the range of indicated by the dataset.[1016] While we can note that such adjustments to the dataset have limitations and dangers, similarly the unadjusted dataset has limitations and dangers when used as a cross-check to the FPP model. The most direct answer to this is to model the expected costs in New Zealand, which is what we have done under the FPP exercise.[1017]

1827. There is limited information we can draw from this as a guide to the FPP modelling.

Can the 2007 dataset further inform us?

1828. The 2007 dataset was the most complete international comparator dataset we have, however it is dated.[1018] One comparison that can be made is to make use of the IPP benchmark that we expect prices to have changed 2.11% since the 2007 decision.[1019]

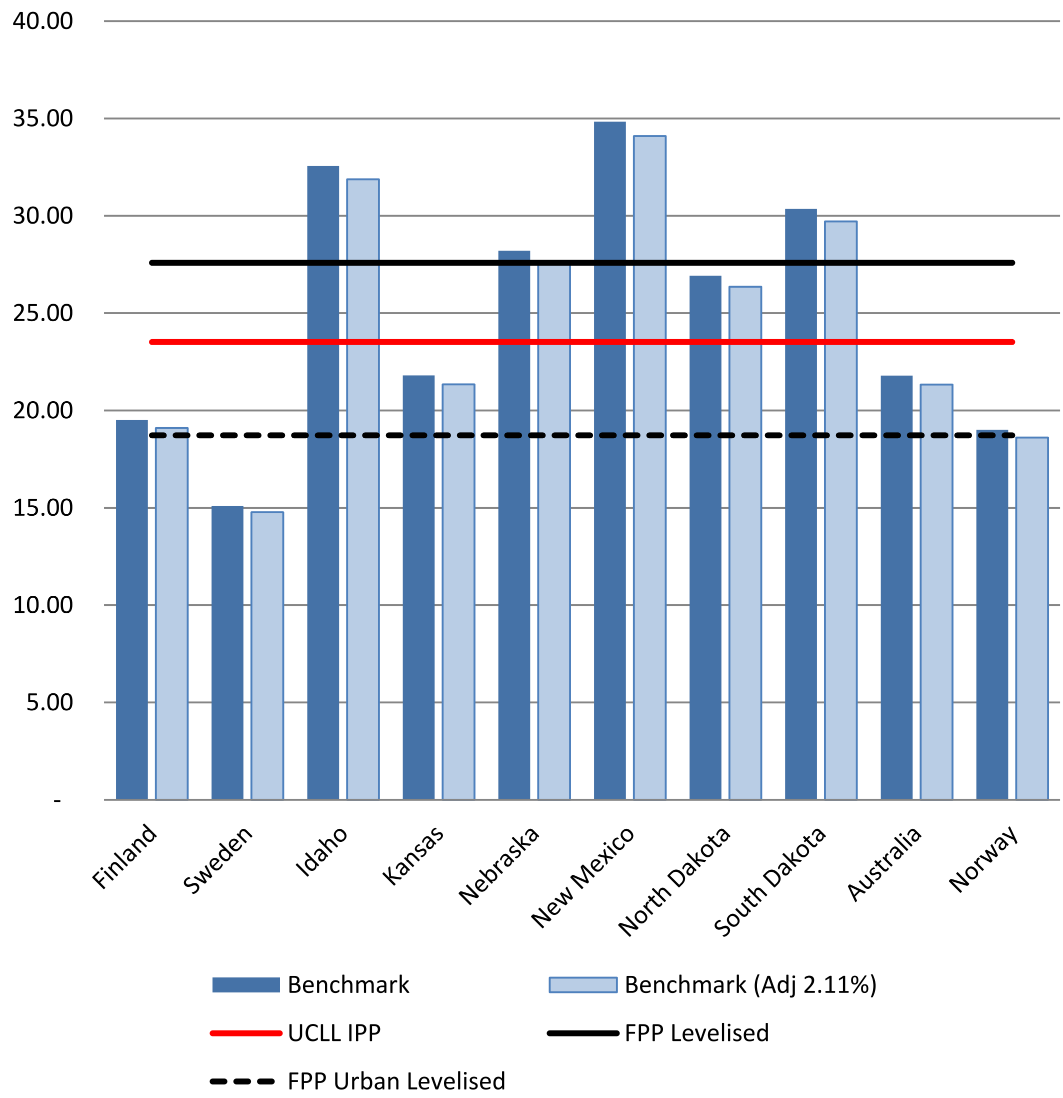
1016 Spark's dataset contains updated numbers for some of these countries, we have checked whether this materially impacts on the range produced by these numbers in comparison to the draft FPP prices and we believe it does not.

1017 See Commerce Commission, Decision No. NZCC 37, paragraph 166 to paragraph 208 for a discussion on the merits and potential issues with econometric adjustments.

1018 This is a material issue as the prices may no longer represent forward-looking costs.

1829. This comparison is illustrated below against the benchmarks used to set the IPP prices for UCLL in 2007.

Figure 5: Comparison with 2007 dataset



1830. Again the further draft FPP prices are within the range indicated. We note, as with the other datasets, there are significant limitations with using this approach as a cross-check to the FPP model and there is limited information we can draw from this to guide the FPP modelling.

[1019] See Commerce Commission, Decision No. NZCC 37, paragraph [265]. As we noted at that time the benchmarks showed a great diversity in price trends including large increases, an alternative approach is to estimate a range from taking the range of increases/decreases and applying that to each data point.

Other issues with using European comparators as a cross-check on the FPP modelling

1831. Spark has submitted that:[1020]

> In terms of New Zealand, we see no evidence that would we [SIC] lead us to conclude that New Zealand is so fundamentally difficult to make network investments in that it should cost 80% more to do so than in other countries. The Commission has correctly excluded the most expensive 6.4% of lines from its UCLL model. These 6.4% of lines have not, and would not in the future, be paid for by a commercial organisation – rather than have and would be paid for by Government and or end-user contributions. The rest of New Zealand is not that different to other countries – in fact we have higher urbanisation that just about all of them (that is, while we may be spread out a bit in our long, skinny country, where we do live we tend to cluster our houses together more than other countries to [SIC]). Even if we are more expensive in some respects then, we are highly unlikely to be 80% more expensive.

1832. Spark, in its cross submission, also directly addressed the relationship between cost and customer density. It notes there is only "a loose relationship between high level population density measures and network cost".[1021] It concludes there is no evidence that the rural dispersion is driving high draft prices.

1833. We agree that averaged national indicators are poor as individual guides to this issue.

1834. In the UCLL IPP we noted that nonetheless we believed that ignoring population density is likely to bias the results of the available comparators.[1022] Our previous criteria were based around population density, urbanisation and teledensity in combination.[1023] In our revised draft decision in the UCLL IPP which Spark has referred to we noted:[1024]

> The Commission expects that there is likely to be some remaining downwards bias in the benchmark set resulting from removing the population density comparability criterion. As noted earlier, New Zealand's population density is lower than all of the countries in the benchmark set. With the exception of Sweden, all remaining countries have a population density over five times higher than New Zealand, while remaining comparable across urbanisation.

1835. We also note that the NZIER report that Spark has referred to as illustrative of cost differences between New Zealand and the UK has identified population density as a key cost driver. It has reported the cumulative distribution of population, which is a better indicator than a national average.[1025]

1020 Spark, UBA and UCLL FPP pricing review draft decision submission, paragraph 35, p. 11.
1021 Spark, UBA and UCLL FPP pricing review draft decision cross submission, 20 March 2015, paragraph [38].
1022 Commerce Commission, Decision No. NZCC37, paragraphs [123 to 133].
1023 This issue was discussed in depth in the draft UCLL IPP decision, see paragraphs [143 to 161].
1024 Commerce Commission, Revised draft determination on the benchmarking review for the unbundled copper local loop service, May 2012, paragraph [160].
1025 The NZIER report is also pointed to as evidence of a smaller likely cost difference. Given this concerns deployment costs of mobile networks this seems weak evidence of potential cost differences. See NZIER, Mobile industry in New Zealand Performance and prospect, October 2014. We also note that Vodafone's cross submission on the comparison to telecommunications prices generally is not informative as this

1836. We have also commissioned TERA to examine the publicly available TSLRIC models[1026] of France, Sweden and Denmark to examine what is driving the difference in modelled outcomes with the draft FPP model. TERA has advised us that spatial dispersion is important and that a good indicator, where available, is the network length per line.[1027] TERA has informed us that New Zealand has a materially more dispersed population than Sweden, France and Denmark which drives higher costs. Hence while Sweden has a national population density close to New Zealand it is less dispersed as indicated by a road network that is significant lower than New Zealand.[1028]

1837. The table below is taken from the TERA report and illustrates the differences.[1029]

Table 23: Key metrics driving UCLL costs

	New Zealand	France	Sweden	Denmark
Active lines (million)	1.82	32.80	4.57	2.59
Cost per line (NZD/month)	38.13	23.82	17.26	12.75
% aerial	46%	67%	N/A	0%
Network length per line (m)	64.3	41.2	51.2	55.0
Density (people/km2)	15	112	20	126
Depreciation factor for trenches	4.8%	9.7%	7.0%	4.9%
Average trenching cost (investment)	85	88	52	34

1838. We can note one indicator of this is the difference between the estimated urban and non-urban levelised costs from our TSLRIC model. The levelised urban TSLRIC estimate is $18.72 and the levelised non-urban TSLRIC estimate is $54.85 in comparison to the geographically averaged levelised price of $27.59,

1839. TERA has further advised us that even within New Zealand urban areas such as Auckland, the spatial density is relatively low. For example TERA has advised us that

may just reflect retail level competition increasing with the structural separation of Telecom. See Vodafone, Cross Submission to the New Zealand Commerce Commission, 20 March 2015.

1026 Most countries TSLRIC models are not publicly available.

1027 We note in relation to trenching costs, that these may well vary between countries and consequently we have commissioned a New Zealand civil engineering company to provide us independent advice.

1028 TERA has also advised us that the cost of trenching is higher in France but lower in Sweden and Denmark. Sweden due to the use of micro-trenching and Denmark because they, uniquely, direct bury all cables.

1029 TERA, "International comparison of TSLRIC UCLL and UBA costs and prices", June 2015. Table 6. As Ireland's cost model is not publicly available the relative figures cannot be shown for Ireland although we understand Ireland's comparative cost is higher than New Zealand on a like-for-like basis.

in comparison to Dublin, Auckland is more sparsely populated and that there are more single dwelling units both of which will tend to drive higher costs. Overall TERA has noted that the New Zealand modelled costs are higher than in France, Sweden and Denmark (but not Ireland) because:

1839.1 New Zealand modelled costs are greater than France due to a higher network length per customer (customer dispersion) and a higher level of overhead network in France;

1839.2 New Zealand modelled costs are greater than Sweden due to trenching costs and network length per customer (customer dispersion); and

1839.3 New Zealand modelled costs are greater than Denmark due to trenching costs, network length per customer (customer dispersion) and low opex in Denmark due to the network being fully underground.

1840. Spark has pointed to our approach to asset valuation and FWA as reasons for the price differences.[1030] This draft determination sets out why we believe our approach to asset valuation and the use of FWA is appropriate. We note that none of the comparators that employ a TSLRIC model have yet implemented the alternative asset valuation methodology recommended by the EC, nor do we have any evidence that there use of fixed wireless deployment has driven lower prices.[1031] Consequently we do not believe these explain apparent differences with European regulated prices.

Are the cross-checks submitted by Chorus informative?

1841. Chorus has referenced its “sense checks” in its cross submission to the Spark evidence.[1032] By this we believe it is referencing the Telecom accounting separation 2010 data, the valuation of the Telstra network in Australia and asset valuation of electricity lines businesses.[1033]

1842. One of these cross-checks refers back to the accounting separation data that Telecom provided to the Commission. We note that in our final summary and analysis of this data we stated.[1034]

[1030] Spark, UBA and UCLL FPP pricing review draft decision submission, paragraph 36. We note other reasons are given including the UBA MEA, however the comparison is against the draft FPP UCLL price not the UBA price.

[1031] For example we understand several of these comparators have no fixed wireless within their models. For Sweden, which does, we understand that the fixed wireless applies to significantly less than 1% of both customers and annual costs.

[1032] Chorus, Cross submission for Chorus in response to Draft Pricing Review Determinations for Chorus’ Unbundled Copper Local Loop and Unbundled Bitstream Access Services, 20 March 2015, paragraph 4.

[1033] Its cross submission is not specific in this respect, however see Chorus, Submission in response to the Commerce Commission’s Consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014), 6 August 2014, p. 6. Chorus has also referred to this in other public documents for example see, Chorus investor presentation, Chorus network modelling, 2 December 2014 and Chorus Institutional Investor Briefing, 21 May 2014.

[1034] Commerce Commission, Summary and Analysis of Telecom Corporation of New Zealand Limited’s Regulatory Financial Report, May 2011, p. 25.

> The Commission notes that the asset valuation methodologies that Telecom has adopted can materially affect regulatory financial statements for its Services Groups and products. The Commission considers that Telecom's CCA valuation of its passive network appears to be substantially overstated. Further work is necessary before the valuation will be useful for understanding the operations of Telecom's Access Services Group and before it can be used to assess Telecom's behaviour with regard to these services.

1843. We also note that the Current Cost Accounts of Telecom may not be representative of the optimised assets used in the FPP TSLRIC model. Consequently, we believe limited reliance can be placed on this evidence for the purposes of a cross-check.

1844. The other cross-check relies on the asset valuation of regulated lines companies in New Zealand and of the Telstra telecommunications network in Australia. Given Electricity Distribution Businesses (EDBs) deploy different assets to telecommunications providers, and both the EDBs and Telstra are subject to a different regulatory regime, again we believe these have limited value as a cross-check. [1035]

1845. Chorus has also referred to the entry-level UFB price as a potential sense check.[1036] Given UFB prices were set by contract they may not necessarily represent a TSLRIC based price.[1037] We note that there are a number of considerations which go to comparing the UFB and FPP prices. Most notably, that the UFB is not a fully loaded network, but is sharing demand with the existing copper network having been deployed in parallel to the existing network and the UFB network is in receipt of public funds.

Conclusions

1846. Overall we find that the Spark and other comparator datasets have significant limitations in acting as a cross-check against the FPP modelled price. The comparators are not like-for-like and we have previously concluded similar benchmarks were downwardly biased due to indications that these countries had higher levels of customer density. Nonetheless, the broad range of evidence available is not indicative that the revised draft prices are significantly adrift from the range of possible outcomes.

1847. With respect to selective European benchmarks, namely France, Denmark and Sweden, we note spatial density considerations are an important cost driver and based on advice from TERA, we understand that these factors are significant in driving higher costs in New Zealand.

1035 See ACCC, Inquiry to make final access determinations for the declared fixed line services: Final Report, July 2011. In this inquiry the ACCC set an initial valuation on the Telstra RAB following its decision to move from a TSLRIC methodology to a building blocks methodology.

1036 Chorus, Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services (2 December 2014), 20 February 2015, paragraph [11].

1037 Vodafone make a similar point, see Vodafone, Cross submission to the New Zealand Commerce Commission, 20 March 2015, paragraph [D2.11].

1848. We find the "sense checks" offered by Chorus have little value as a cross-check on the FPP price.

Attachment R: Analysis of submissions on framework for considering a TSLRIC Uplift

Purpose of this Attachment

1849. In this Attachment, we summarise the submissions received on the analytical framework we proposed in our 2 April 2015 paper for considering the potential welfare effects of an uplift to the UCLL price. [1038] We also set out our views on the need for any changes to our framework, in light of those submissions.

1850. The main issues raised in the submissions were broadly grouped around the model inputs and assumptions we had made, and the welfare effects that we had omitted. We consider each of these below.

1851. We also note that a number of RSPs have made reference to the Vertigan report which assesses the costs and benefits of high-speed broadband deployment in Australia. [1039] The assessment of costs and benefits in that case focusses on a number of different deployment scenarios, including the unsubsidised roll-out of HFC and FTTN technologies, the deployment of a mix of fixed line (FTTH, FTTN, and HFC) technologies and fixed wireless/satellite to more remote areas, and the deployment of FTTH and fixed wireless/satellite to more remote areas. The report concludes that the unsubsidised roll-out scenario would deliver the greatest net benefits, with the scenario involving FTTH and fixed wireless/satellite delivering the least net benefits.

1852. While we have had regard to the Vertigan assessment, we note that the purpose of the Vertigan assessment is different from what we are considering in the current case. The Vertigan report was considering the net benefits of different deployment options for high-speed broadband infrastructure. Such an assessment is more relevant for policy decisions around whether to support the deployment of high-speed broadband networks. In our view, that differs from our current consideration of the effects of a potential increase in the UCLL price, which may have a more incremental effect on migration between networks, given that the UFB deployment has already been committed and subsidised.

Model inputs and assumptions

Cross-price elasticity of demand for fibre

1853. In our 2 April 2015 paper, we noted that the cross-elasticity of demand for fibre with respect to DSL prices is important, as this determines the extent to which demand for UFB subscriptions will be higher under the scenario where a UCLL uplift is applied (compared to the scenario where no UCLL uplift is applied). We referred to a small number of studies which attempted to estimate this cross-price elasticity, with estimates ranging from 0.6 to 3.289. We used a point estimate of 1.2, and a range from 0.3 to 3.0.

[1038] Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 2 April 2015.
[1039] "Independent cost-benefit analysis of broadband and review of regulation" August 2014. Available at https://www.communications.gov.au/departmental-news/independent-cost-benefit-analysis-nbn

1854. Network Strategies agreed that there is very limited information available on the cross-price elasticity of demand for fibre with respect to copper.[1040] It submitted that the upper estimate of 3.3 should be ignored, as one of the authors subsequently produced a conference paper which appears to use the same data but producing much lower cross-price elasticities (between 0.845-0.945).

1855. Network Strategies also argued that the result referred to by Professor Vogelsang (1.189) is unlikely to be representative of the New Zealand market, as it was based on a period commencing in 2000. Network Strategies noted that Professor Vogelsang was cautious about relying on this result. Network Strategies recommended a range of 0.6-1.0.

1856. WIK also claimed that a cross-elasticity of demand of 1.2 is relatively high, and that the underlying study relates to a period of low penetration. WIK advised that although many demand studies show that high copper prices induce customers to switch to fibre, the price effect is only one of several factors influencing customer behaviour, with others being quality of service and applications.[1041]

1857. Vodafone supported Network Strategies recommended range of 0.6-1.0.[1042] However, Houston Kemp, on behalf of Chorus, argued that the cross-price elasticity may be relatively high in New Zealand as penetration increases from relatively low levels, and as the retail price differential between fibre and copper-based services appears to be small.[1043]

1858. In reviewing the submissions on our 2 April 2015 paper, Professor Cambini has concluded that a cross-price elasticity of 1.2 remains reasonable. However, he advised that the Swedish study underpinning the higher estimate (3.289) is based on a relatively advanced level of demand for fibre-based services compared to New Zealand, and that this could point to a lower range.[1044]

1859. In our view, a cross-price elasticity of 1.2 remains reasonable in light of submissions. While less weight could be placed on the higher estimate due to the advanced demand for fibre in Sweden, we also consider that the convergence of retail prices for fibre and copper-based services in New Zealand is likely to heighten the sensitivity of demand between these services.

1860. We acknowledge that there is a relatively small sample of empirical studies available, and that there is considerable uncertainty around demand elasticity estimates and their application to different markets. However, for the purposes of considering the

[1040] Network Strategies “Analytical frameworks for an uplift to the TSLRIC price and WACC” 11 May 2015, Section 2.1.
[1041] WIK-Consult “Submission on the Commerce Commission’s analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 8 May 2015, Section 4.2.2.
[1042] Vodafone “Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 11 May 2015, paragraph [D1.15].
[1043] Houston Kemp “Comment on the Commerce Commission’s paper: Agenda and topics for the conference on the UCLL and UBA pricing reviews” 11 May 2015, p. 25.
[1044] Carlo Cambini “Potential welfare gains and losses from an uplift to copper prices: A Reply to Companies’ comments” 19 May 2015, p. 5.

potential effects of an uplift in the current case, we have used a cross-price elasticity of 1.2 (within a range of 0.6 to 3.0).

Discount rate and timeframe

1861. In our 2 April 2015 paper, we used a discount rate of 10% to derive present values of the benefits and costs from an uplift over a 15 year period.[1045]

1862. Network Strategies proposed that we use a discount rate of 8%, which is Treasury's current recommended default rate for public sector cost-benefit analyses. Although the Treasury recommends 9% for "telecommunications, media and technology, IT and equipment, knowledge economy (R&D)", Network Strategies submitted that fixed telecommunications is a relatively low risk within this category.[1046]

1863. WIK questioned whether it is appropriate to include welfare effects beyond the 5-year regulatory period, as prices can be reset at the end of the 5 years and the wholesale fibre prices may be revisited in 2019.[1047]

1864. Vodafone supported the use of the Treasury's discount rate of 9%, and the use of a 5 year timeframe as prices can be reset at the end of the regulatory period.[1048, 1049] Wigley and Company also supported the use of a 5-year timeframe for considering the potential benefits and costs of an uplift.[1050]

1865. Houston Kemp considered the assumptions of a 10% discount rate and 15 year timeframe to be reasonable.[1051]

1866. We have amended the discount rate used in our analysis to 9%, in line with the Treasury's recommendation.

1867. In terms of the timeframe, we consider that a shorter period as proposed by the RSPs is not appropriate, as we are considering the long-term benefit of end-users, and as noted by Professor Cambini, the investments being made are in long-lived assets.[1052, 1053]

1045 We initially used a timeframe of 10 years, but have extended this to 15 years in light of Professor Cambini's recommendation.

1046 Network Strategies "Analytical frameworks for an uplift to the TSLRIC price and WACC" 11 May 2015, Section 2.3.

1047 WIK-Consult "Submission on the Commerce Commission's analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 8 May 2015, Section 4.2.4.

1048 Vodafone "Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 11 May 2015, paragraph [D1.17].

1049 ibid, paragraph [D2.15].

1050 Wigley and Company "Commentary on behalf of consumer interests on Commerce Commission paper dated 2 April 2015 as to TSLRIC and WACC uplifts" 13 April 2015, paragraph [3.5].

1051 Houston Kemp "Comment on the Commerce Commission's paper: Agenda and topics for the conference on the UCLL and UBA pricing reviews" 11 May 2015, p. 26.

1052 Carlo Cambini "Economic aspects of migration to fibre and potential welfare gains and losses from an uplift to copper prices" 16 March 2015, p. 6.

1053 We also note that the Vertigan report referred to by a number of the RSPs examines benefits and costs over the period from 2015-2040.

UFB demand

1868. In our 2 April 2015 paper, we assumed that UFB demand would grow from 100,000 subscriptions in 2015, by an average of 100,000 additional subscriptions each year. This initial demand profile was adjusted based on advice from Professor Cambini to reflect the likely positive relationship between fibre demands in adjacent periods. We also capped the level of UFB subscriptions to be no more than 80% of New Zealand households, to reflect the (expanded) UFB coverage.

1869. Network Strategies submitted that our assumption that all households within the UFB footprint will take up fibre by 2029 is likely to have a significant impact on the estimated welfare effect, and that we should consider the impact of a lower UFB market share (such as 75%, 80%, and 90%) to take into account mobile-only and cable households.[1054] Vodafone supported Network Strategies' proposal.[1055]

1870. Network Strategies also proposed that we base our assumption of household growth on Statistics New Zealand population projections, rather than on historic growth over 2004-2014.

1871. Houston Kemp suggested that an increase in the UCLL price could lead to increased investment in fibre, and that the increased availability of fibre could result in higher UFB demand.[1056] According to Houston Kemp, this could significantly increase the welfare benefits arising from an uplift.

1872. In our view, it may be appropriate to take into account the likelihood that some households within the UFB coverage areas decide not to subscribe to UFB services. To allow for this, we have lowered the cap on the number of UFB households. As noted above, in the 2 April 2015 paper, we capped the level of UFB subscriptions to be no more than 80% of New Zealand households, which in effect assumed that all households within the UFB area would end up subscribing to UFB services. We have now included a sensitivity which allows for a UFB share of less than 100%.[1057]

1873. We also note that according to Statistics New Zealand's household projections for the period from 2016-2031, annual household growth is expected to range between

[1054] Network Strategies "Analytical frameworks for an uplift to the TSLRIC price and WACC" 11 May 2015, Section 2.2.

[1055] Vodafone "Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 11 May 2015, paragraph [D1.7].

[1056] Houston Kemp "Comment on the Commerce Commission's paper: Agenda and topics for the conference on the UCLL and UBA pricing reviews" 11 May 2015, p. 23.

[1057] For example, we previously found that the potential externality benefit from a $1 uplift could be $19.4 million (NPV over 15 years), given a cross-price elasticity of 1.2 and an externality value of 25% of UFB expenditure. By lowering the maximum number of UFB subscriptions from 100% of households within the UFB footprint (equivalent to 80% nationally) to 90% of households within the UFB footprint (72% nationally), the potential externality benefit drops to $16.4 million (NPV over 15 years).

0.8%-1.2% per annum.[1058] Our household growth assumption of 1% per annum therefore appears reasonable.

1874. We have also considered the argument put forward by Houston Kemp that an uplift to the UCLL price could lead to greater investment in and availability of fibre. According to Houston Kemp, an uplift to the UCLL price could lead to greater investment in fibre, as well as greater investment by RSPs in systems to increase uptake by end-users of fibre-based services. However, we note the following:

1874.1 While an increase in the UCLL price could incentivise further investment by LFCs, the LFCs will continue to face competition from Chorus' UCLL network which may dampen any price increases in those areas. In addition, as noted earlier, the requirement to set a geographically averaged UCLL price is likely to result in a regulated wholesale price which exceeds cost in urban areas. As these are the areas where the current LFCs operate (and any new LFCs are likely operate), the UCLL price is likely to incentivise such investment in alternative networks without the need for a further uplift.

1874.2 In terms of RSPs incentives to invest to promote fibre migration, it is not clear how an uplift to the UCLL price would affect these incentives. As noted by Houston Kemp, if RSPs are able to earn a higher margin on UCLL-based services, they may be less likely to encourage migration to fibre. However, competition between RSPs is likely to constrain RSP margins on both UCLL-based and fibre-based retail services. In our 2 April 2015 paper, we found that a high level of pass-through might be reasonable due to strong competition between RSPs.

1875. We have therefore not included any investment effect in our consideration of the welfare effects of a potential uplift in the UCLL price. We do, however, consider the potential for more general investment effects within the context of a WACC uplift, which is further discussed elsewhere in this Chapter.

Valuation of externalities

1876. In our 2 April 2015 paper, we estimated the level of UFB demand with and without a UCLL uplift. This enabled the incremental effect of the uplift on fibre demand to be isolated. However, we also noted the difficulty in establishing the value of any network externality effect that could be attributable to the UCLL uplift. The only example we were aware of was an attempt by Ofcom to set a Network Externality Surcharge (NES) on mobile termination rates, which reflected the value to existing mobile subscribers of having an additional subscriber join a mobile network and therefore having a larger base of contactable subscribers. The value of the mobile NES derived by Ofcom was equivalent to approximately 2% of retail mobile revenues.

[1058] See "National Family and Household Projections: 2006 (base) – 2031 – Tables" available at: http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/NationalFamilyAndHouseholdProjections_HOTP2006-2031update.aspx

1877. We also noted that while Ofcom's NES may capture the network externality effect (whereby the utility of existing subscribers increases as more subscribers are added to the network), it did not appear to capture the potential gains from new innovations which might emerge as a result of expanding the UFB customer base. We therefore used a range of externality values of 25% and 50% of retail expenditures for sensitivity purposes.

1878. In submissions on the 2 April 2015 paper, Network Strategies agreed that there was likely to be some network externality effects, but that such effects are difficult to estimate and likely to be relatively small, as most if not all of the applications can be used over copper-based broadband connections.[1059] According to Network Strategies, the mobile NES derived by Ofcom (which was rejected by the UK Competition Commission) is not relevant for fibre broadband services, and the 25% and 50% values have no justification. Network Strategies referred to the 0.7% network externality effect in the Briglauer study (cited by Professor Cambini) as the only option, and was not aware of any other studies.

1879. Vodafone also noted that there was "almost no literature available" to assist in valuing any network externality, referring only to the Briglauer study as estimating a network externality effect of 0.7%.[1060] Vodafone submitted that benefits from services such as high-definition video-conferencing are available from copper-based services, and that the development of innovative applications and content over fibre is unlikely to be stimulated by wholesale copper prices, as such developments are largely driven by international markets.[1061]

1880. Spark submitted that there is no evidence of fibre-specific externality effects, and that any such claimed externality effects are capable of being provided over the existing copper/FTTN network. [1062] Spark referred to the Vertigan report in Australia, which found that the expected demand for bandwidth by households in 2023 will be 15 Mbps, which is capable of being met by copper/FTTN-based services.

1881. Wigley and Company criticised the externality values used in the 2 April 2015 paper as being largely guesses, and referred to the Vertigan report which concluded that the drivers for migrating to faster networks are low.[1063],[1064]

1882. WIK questioned the empirical basis of the externality effects we discussed in the 2 April 2015 paper, and whether such effects could be attributed to faster migration of customers to UFB in New Zealand.[1065,1066] WIK noted that many applications do not

1059 Network Strategies "Analytical frameworks for an uplift to the TSLRIC price and WACC" 11 May 2015, Section 2.4.
1060 Vodafone "Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 11 May 2015, paragraph [D2.9].
1061 ibid, paragraph [D2.7].
1062 Spark "Analytical framework for considering an uplift to FPP prices" 11 May 2015, paragraphs [36, 37].
1063 Wigley and Company "Commentary on behalf of consumer interests on Commerce Commission paper dated 2 April 2015 as to TSLRIC and WACC uplifts" 13 April 2015, paragraph [7.5].
1064 ibid, paragraph [12.4].
1065 WIK-Consult "Submission on the Commerce Commission's analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 8 May 2015, paragraph [92].

depend on fibre, and that the development of many applications occur on a global basis.[1067]

1883. Houston Kemp submitted that the approach we proposed to estimating externality effects in the 2 April 2015 paper was appropriate.[1068]

1884. We note that according to CEG, if the price of copper services is set too low, migration to ultra-fast broadband could be slowed, and the benefits from ultra-fast broadband would be delayed. [1069] For example, Bell Labs estimated that consumer surplus in New Zealand could increase by $32.8 billion over a 20 year period, as a result of high-speed broadband applications enabled by the UFB and RBI deployment in New Zealand. CEG estimates the impact on the net present value of consumer surplus from a delay of one year, two years and five years, as well as the impact of slower migration and uptake of fibre.

1885. However, CEG fails to establish a nexus between a UCLL uplift and the incremental effect on migration to fibre. For example, CEG estimated the impact on consumer welfare of a one-year delay to be $757 million in NPV terms, although do not include any assessment of a causal connection between a UCLL price uplift and the assumed delay.

1886. Having reviewed submissions on the potential benefits from faster migration to fibre-based services, we note that a number of RSPs referred to the results of the Briglauer study which was identified by Professor Cambini in his report of 16 March 2015. In reviewing these submissions, Professor Cambini has confirmed that the Briglauer estimate of 0.7% refers to a speed of diffusion effect, which we have used to adjust our estimates of UFB demand, rather than a proportion of expenditure:[1070]

> In sum, as said before, the Commerce Commission does consider the Briglauer's evidence and correctly applies its quantitative effect on the estimation of *demand expansion* of fiber connections and not on the estimation of the monetary values derived from them.
>
> Note that none of the submissions received by the Commission appear to have identified any other studies/empirical evidence on the likely magnitude of any network externality effect from fibre.

1887. We recognise that there is considerable uncertainty around the quantification of the effect of network externalities. Given the lack of new evidence provided by submissions, and Professor Cambini's advice regarding the Briglauer study, we have retained the approach that we proposed in the 2 April 2015 paper, in which we considered a range of potential externality values. For the purposes of our analysis of the effects of a potential uplift, we have derived an externality effect as a proportion of expenditure on UFB services, using values of 2%, 25%, and 50%.

1066 ibid, paragraph [87].

1067 ibid, paragraph [89, 90].

1068 Houston Kemp "Comment on the Commerce Commission's paper: Agenda and topics for the conference on the UCLL and UBA pricing reviews" 11 May 2015, p. 24.

1069 CEG "Welfare effects of UCLL and UBA uplift" March 2015, Section 5.

1070 Carlo Cambini "Potential welfare gains and losses from an uplift to copper prices: A Reply to Companies' comments" 19 May 2015, p. 7.

Model omissions

1888. Network Strategies submitted that the increased cost of copper services arising from the uplift should be based on average connections over the year, rather than year-end connections. As the number of copper connections are declining, the use of year-end connections understates the higher costs by $4.7 million in NPV terms.[1071] Network Strategies identified a similar issue with UFB expenditure, noting that the use of year-end connections overstates benefits by around $1 million in NPV terms.

1889. We have amended the UFB connections to reflect the average connections in each year. As the reduction in copper connections is driven by the increase in UFB connections, the resulting level of copper connections reflects average connections throughout each year.

1890. A number of submissions refer to other potential welfare effects that could arise from an increase in copper prices, including:

1890.1 customers switching from copper-based services to non-fibre services (such as mobile or HFC);[1072,1073]

1890.2 customers remaining on copper-based services but downgrading to lower-priced plans;[1074,1075]

1890.3 customers giving up broadband services altogether.[1076]

1891. In addition, several submissions refer to the possibility of retail prices for fibre plans increasing in response to the increase in copper prices, which would dampen any migration towards fibre, and the potential loss of copper-based network externalities as customers respond to higher copper prices.[1077,1078,1079,1080,1081,1082,1083]

1071 Network Strategies “Analytical frameworks for an uplift to the TSLRIC price and WACC” 11 May 2015, p. 10.

1072 Vodafone “Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 11 May 2015, paragraph [D2.11].

1073 Network Strategies “Analytical frameworks for an uplift to the TSLRIC price and WACC” 11 May 2015, p. 14

1074 Vodafone “Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 11 May 2015, paragraph [D2.11].

1075 Network Strategies “Analytical frameworks for an uplift to the TSLRIC price and WACC” 11 May 2015, p. 14, 15.

1076 WIK-Consult “Submission on the Commerce Commission’s analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 8 May 2015, paragraphs [103-105].

1077 Wigley and Company “Commentary on behalf of consumer interests on Commerce Commission paper dated 2 April 2015 as to TSLRIC and WACC uplifts” 13 April 2015, Section 10.

1078 Vodafone “Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 11 May 2015, paragraph [D2.13].

1079 Network Strategies “Analytical frameworks for an uplift to the TSLRIC price and WACC” 11 May 2015, p. 14, 15.

1080 WIK-Consult “Submission on the Commerce Commission’s analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 8 May 2015, paragraphs [97-100].

1081 Vodafone “Submission to the Commerce Commission on Commission paper: Analytical frameworks for considering an uplift to the TSLRIC price and/or WACC” 11 May 2015, paragraph [D2.13].

1892. WIK also submitted that the costs of switching to fibre-based services (such as inhouse cabling and equipment) have not been considered.

1893. We recognised a number of these factors in our 2 April 2015 paper. It is possible that subscribers to copper-based services may respond in a range of ways to an increase in copper prices, such as switching to fibre and non-fibre alternatives. We have used a cross-price elasticity of fibre demand with respect to DSL prices to estimate the migration effect to fibre. We note that to the extent that the cross-price elasticity does not reflect switching costs, such costs are likely to reduce the migration effect, although as Professor Cambini notes, the switching costs in WIK's submission are illustrative only:[1084]

> It is therefore difficult to say something realistically about the real quantitative effect of such switching costs.

1894. We also note Professor Cambini's view that subscribers to copper-based services are more likely to respond to an increase in copper prices by switching to other forms of broadband service, rather than giving up broadband altogether.[1085] To the extent that broadband penetration does fall, this will tend to further reduce the net benefits of introducing an uplift to the UCLL price.

1895. WIK has also argued that our TSLRIC approach already encourages migration to fibre. WIK refers to Professor Vogelsang's advice that the decisions to exclude re-use of assets and to exclude any performance adjustment for fibre compared to copper-based services can be viewed as incentivising migration to fibre. According to WIK, the UCLL price in our December 2014 draft determination, which was $28.22 per month, should be adjusted downwards by 13% to allow for re-use, and a further $6 per month to reflect the retail price differential between fibre and copper services (and assuming no differences in the downstream costs of supplying fibre and copper services). The resulting "migration-neutral" UCLL price is estimated by WIK to be $18.55 per month.

1896. WIK submitted that the impact of geographic averaging of the TSLRIC price will have a similar effect in terms of incentivising innovation and reducing investment risks.

1897. In principle, WIK's view is consistent with our view in the December 2014 draft determination paper, that a number of modelling decisions are likely to have a cumulative effect which mitigates the need for an explicit uplift. As discussed in Chapter 4 of this further draft determination, we have had regard to the factors referred to by WIK in our consideration of the need for an explicit uplift.

1082 Network Strategies "Analytical frameworks for an uplift to the TSLRIC price and WACC" 11 May 2015, p. 15.

1083 WIK-Consult "Submission on the Commerce Commission's analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 8 May 2015, paragraphs [101-102].

1084 Carlo Cambini "Potential welfare gains and losses from an uplift to copper prices: A Reply to Companies' comments" 19 May 2015, p. 9.

1085 ibid, p. 8.

1898. However, we do not accept WIK's specific adjustments to the modelled TSLRIC price, for the following reasons:

1898.1 It is not clear how WIK's 13% adjustment for re-use accounts for New Zealand-specific conditions, such as the proportion of underground network which is ducted, and the recent investment made by Chorus in its duct network.[1086]

1898.2 WIK's proposed performance adjustment of $6 per month is based on WIK's assessment of the differential in retail prices, but assumes that there is no difference in downstream costs of supplying fibre and copper services (such as the cost of customer premises equipment(CPE)). However, WIK acknowledge earlier in its submission that there are costs associated with changing CPE for fibre.[1087] WIK has also previously found that the downstream costs of FTTH are higher than for copper services, for example due to customer premises equipment. [1088] By WIK's own approach, this would reduce any performance adjustment to the UCLL price.

Summary of amendments and results

1899. Having reviewed and considered submissions on the analytical framework we proposed in our 2 April 2015 paper for considering the potential welfare effects of an uplift to the UCLL price, we have made a number of amendments as discussed above. Our amendments are summarised in Table below.

[1086] As noted in the discussion of asset valuation, TERA has estimated that the impact of allowing for re-use in a New Zealand context could be 9% of the TSLRIC estimate for the UCLL service.

[1087] WIK-Consult "Submission on the Commerce Commission's analytical frameworks for considering an uplift to the TSLRIC price and/or WACC" 8 May 2015, paragraphs [110, 111].

[1088] Ingo Vogelsang "What effect would different price point choices have on achieving the objectives mentioned in s 18, the promotion of competition for the long-term benefit of end-users, the efficiencies in the sector, and incentives to innovate that exist for, and the risks faced by investors in new telecommunications services that involve significant capital investment and that offer capabilities not available from established services? - Paper Prepared for the New Zealand Commerce Commission" 5 July 2013, paragraph [47].

Table 24: Summary of amendments to TSLRIC uplift framework

Issue	2 April 2015 paper	Amendment	Excel cell reference[1089]
Discount rate	10%	9%	C4
UFB demand cap (% of households within in UFB footprint)	100%	100% but can be varied	C12
UFB and copper demand	Connections based on end-of-year	Connections based on average throughout year	G24:G37, H24:H37

1900. Table 25 summarises the estimated net consumer welfare effects of increasing the central estimate of the TSLRIC price by $1.

Table 25: Summary of net welfare effects of a TSLRIC uplift

		Network externality as % of UFB expenditure		
		2%	25%	50%
Cross-elasticity	0.6	-$105,802,618	-$96,617,596	-$86,633,876
	1.2	-$104,609,732	-$86,239,687	-$66,272,248
	3.0	-$101,031,074	-$55,105,963	-$5,187,363

1901. As we noted in our 2 April 2015 paper, there may be other factors which could affect the net benefits from an uplift to the UCLL TSLRIC price.

1089 See worksheet titled "Net Benefit calcs (15yrs)" which appears in the Excel spreadsheet "TSLRIC Uplift_Final (July 2015).xlsx".

Attachment S: Chorus' cost model

1902. As part of the consultation process, Chorus submitted its own cost model developed by Analysys Mason. Apart from the model being subject to submissions and cross submissions we asked TERA to review the model and compare it to the model developed by TERA.[1090] TERA's review has been published along with our further draft determination paper.

1903. TERA's report and the comparison between the two models is based on the December 2014 version of TERA's model and not the updated version which has been released along with our further draft determinations.

Submissions

1904. Spark submitted that Chorus' cost model diverges materially from the requirements of a TSLRIC cost model as required under the Act.[1091]

1905. Vodafone has submitted that Chorus' cost model has been built to reflect Chorus' actual network and therefore does not reflect an economically efficient operator utilising modern equivalent assets (MEA).[1092]

1906. Based on this Vodafone concluded, that the model therefore does not adhere to the Commission's TSLRIC modelling criteria and principles.[1093]

1907. Network Strategies for Spark and Vodafone carried out its own review of Chorus' cost model and concluded that while some differences between the two models relate to alternative values of inputs and assumptions, others are contrary to the fundamental principles of TSLRIC modelling and as such fail to comply with the requirements of the FPP process.[1094]

1908. Network Strategies for Spark and Vodafone highlight the following areas where Chorus' cost model does not comply to the principle of TSLRIC and/or the requirements of the FPP process:

1908.1 Inefficient historic network design.

1908.2 No efficiency adjustments for operating costs.

1090 TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Analysis of Chorus cost model" March 2015.

1091 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL 20 February 2015, paragraph [114].

1092 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [O2.2].

1093 Vodafone "Submission on process paper and draft pricing review determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and comments on Analysys Mason's TSLRIC models" 20 February 2015, paragraph [O2.2].

1094 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL 20 February 2015, p. 73.

1908.3 Increasing asset counts with constant service demand.

1908.4 Declining service demand for UBA.

1908.5 Annuity is not tax adjusted.[1095]

1909. As a consequence of its review, Network Strategies for Spark and Vodafone recommended that we disregards Chorus' cost model as it does not reflect the efficient deployment of a hypothetical efficient operator's MEA network.[1096]

1910. WIK for Spark and Vodafone have also carried out its own review of Chorus' cost model and submitted, based on the review, that the model is not estimating the cost of an efficiently engineered copper network and does not derive efficient costs. Instead, WIK argued, the model is valuing an inefficient network.[1097]

TERA review of Chorus' model

1911. TERA's review of Chorus' cost model shows that while there are many similarities between TERA's model and Chorus' model, there are also very significant differences.

1912. For the calculation of opex, both models are based on Chorus' accounts, but no efficiency adjustment is applied in Chorus' model. Compared to Chorus' model, opex for UCLL was 19% lower in the December 2014 version of TERA's model and 29% lower for UBA.[1098]

1913. The core network in both models is based on a bottom-up approach, but while TERA has modelled each node in the network, Chorus has used a geotyping approach and is therefore less precise. Combined with a different scope of the modelled networks, higher WACC and unit costs, this results in Chorus' costs for UBA being 51% higher than in TERA's model from December 2014.[1099]

1914. According to TERA's review, the biggest difference between the two cost models is the approach to the modelling of the access network. Chorus' model for the access network is basically a top-down model based on Chorus' copper network and inventory where adjustments have been made to take into account a higher degree of aerial deployment and some degree of optimisation applied to the inventory. In contrast, TERA has modelled an optimally-structured access network based on a bottom-up approach constrained only by the existing number of nodes and their

[1095] Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL 20 February 2015, p. 75-78.

[1096] Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Commerce Commission draft determination for UCLL and UBA" CONFIDENTIAL 20 February 2015, p. 92.

[1097] WIK-Consult "Submission in response to the Commerce Commission's Draft pricing review determination for Chorus' unbundled bitstream access and unbundled copper local loop services including the cost model and its reference documents" CONFIDENTIAL 20 February 2015, paragraph [458].

[1098] TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Analysis of Chorus cost model" March 2015, p. 4.

[1099] TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Analysis of Chorus cost model" March 2015, p. 5.

existing locations. Furthermore Chorus has used a higher WACC, higher unit costs, shorter asset lives and lower price trends. All these differences results in the annuity for the access network being 274% higher in Chorus' model than in TERA's model from December 2014.[1100]

Analysis

1915. We generally agree with submitters that Chorus' cost model does not reflect the costs of an efficiently built network as it primarily is a top-down model based on Chorus' copper network with some minor efficiency adjustments, rather than a bottom-up model based on an optimised modern equivalent asset network with significant efficiency adjustments applied where needed.

1916. While some of the differences between the output of Chorus' and TERA's cost models relate to the use of different input parameters like WACC and asset lifetimes, they are also the result of fundamental methodological differences like the choice of MEA, the degree of optimisation and most importantly, the starting point of the cost calculations (top-down or bottom-up).

1917. For these reasons we find that Chorus has not presented us with an appropriate TSLRIC-model that can be used to set the prices of the UCLL and UBA services in New Zealand.

[1100] TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Analysis of Chorus cost model" March 2015, p. 5.