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Further draft pricing review determination for Chorus' unbundled bitstream access 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 bitstream access service (UBA) which is used by retail service providers (RSPs) to provide the majority of fixed line broadband services in New Zealand. RSPs use this service as an input in providing a retail broadband service to consumers.

2. Our further draft decision for UBA is to set nominal monthly prices over a five-year regulatory period shown in the table below. Here we show the two components of the total UBA charge:

   2.1 Firstly the unbundled copper local loop (UCLL) component: this represents the network infrastructure which connects end-users to the local exchange or cabinet. This component is subject to a separate further draft decision the price of which forms part of the total UBA price; and

   2.2 Secondly the additional cost components of UBA which we refer to as the UBA increment: this represents the electronics and some additional infrastructure which is required in addition to the UCLL component to provide the bitstream service and is the subject of the modelling within this further draft decision.

3. These two components combined provide the price for a Basic UBA service. In this table we show only the Basic UBA service which is the predominant UBA service variant provided by Chorus. This further draft determination also covers the Enhanced UBA variants which are regulated.

Service	Year 1	Year 2	Year 3	Year 4	Year 5
Basic UBA additional costs ("UBA increment")	$11.15	$10.97	$10.80	$10.65	$10.52
UCLL (as set in the July 2015 further draft determination, subject to the final determination)	$26.74	$27.18	$27.63	$28.09	$28.56
Basic UBA (total)	$37.89	$38.15	$38.43	$38.74	$39.08

4. UBA, together with UCLL, is a significant part of Chorus' business. 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 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.[1] The

[1] 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.

UCLL charge is the predominant amount at $26.74 with the additional costs of UBA being $11.15.

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

6. In 2011 the UBA pricing principle changed from a retail-minus methodology to one based on costs. The price for UBA was frozen under the retail-minus methodology until 1 December 2014 at which point the price we determined by the initial pricing principle (IPP) took effect. The IPP price of $10.92 for the additional costs is quite close to the further draft price of $11.15 that we have found through our modelling.

7. TSLRIC is comprised of the annuitised replacement cost for these additional UBA network components combined with operating costs. Our view is that the relevant access network over which the UBA services are provided is similar to what operates today: a mixture of copper and fibre to the cabinets. We have then modelled the Modern Efficient Assets that comprise the additional cost components needed to provide a UBA service over this network. We have chosen this access network because the TSLRIC price of UBA sets the price of the Chorus service which competes with similar services from RSPs who have installed their own equipment within Chorus' network.

8. In order to build up the additional UBA network 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.

9. The UBA 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 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 about a 30% reduction in forecast NRC.

10. 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.

11. 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.

12. The final FPP prices we set through this price review determination process will replace the 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 RSPs compensating Chorus accordingly for the difference between the IPP and FPP prices during this year.

Introduction and process

Purpose of this document

13. We are in the process of setting prices for the unbundled bitstream access (UBA) services provided by Chorus, using the final pricing principle (FPP) as set out in the Telecommunications Act 2001 (Act).

14. For UBA the FPP is "the price for Chorus's unbundled copper local loop (UCLL) network plus TSLRIC of additional costs incurred in providing the unbundled bitstream access service",[2] which we discuss in Chapter 1.

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

    15.1 the draft TSLRIC prices for monthly recurring charges for the UBA service;

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

    15.3 our further draft decision on backdating.

16. Accordingly, we have determined the following draft prices monthly recurring charges for the Basic UBA service:[3]

	Year 1	Year 2	Year 3	Year 4	Year 5
Basic UBA additional costs ("UBA increment")	$11.15	$10.97	$10.80	$10.65	$10.52
UCLL (as set in the July 2015 further draft determination, subject to the final determination)	$26.74	$27.18	$27.63	$28.09	$28.56
Basic UBA (total)	$37.89	$38.15	$38.43	$38.74	$39.08

17. 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 about a 30% reduction in forecast NRC.

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

[3] As explained in Chapter 3, we have also set further draft prices for the Enhanced UBA variants specified in the UBA STD.

18. 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.

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

Background

The UBA service

20. The UBA service is a designated access service described in the Act as follows:[4]

Chorus's unbundled bitstream access

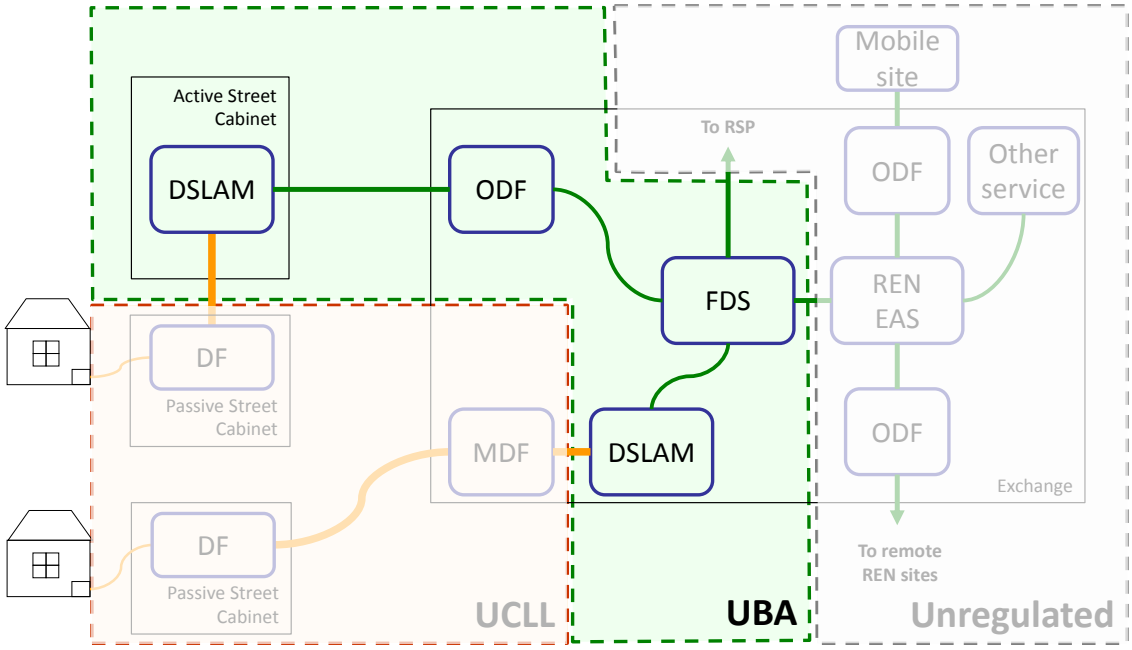
Description of services:	A digital subscriber line enabled service (and its associated functions, including the associated functions of operational support systems) that enables access to, and interconnection with, that part of a fixed PDN that connects the end-user's building (or, where relevant, the building's distribution frame) to a first data switch (or equivalent facility), other than a digital subscriber line access multiplexer (DSLAM) To avoid doubt, unless otherwise requested by the access seeker, the supply of this service must not be conditional on a requirement that the access seeker, end-users, or any other person must purchase any other service from the access provider

21. The scope of this further draft determination is limited to determining the cost of the "UBA increment". Therefore, because we are concerned only with identifying the TSLRIC of the UBA increment, whenever we refer to the UBA network or UBA service we are (unless otherwise indicated) referring to the core network highlighted in green in figure 1 below.[5]

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

[5] As explained in Chapter 2 and Attachment B (MEA for UBA), we have modelled the MEA for the UBA service based on the underlying copper access network.

Figure 1: Core network model scope



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

22. 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 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.

23. As explained by the Court of Appeal, in 2011, following Telecom's decision to participate in the UFB initiative, the Act was amended: [6,7,8]

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

    23.2 Chorus was prohibited from providing retail services, and entered into undertakings to provide wholesale services on a non-discriminatory basis[9]

    23.3 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[10]

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

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

8 Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011 (the 2011 Act).

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

23.4 Section 18(2A)[11] was inserted, in particular in connection with the UFB initiative, providing that consideration must be given to "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

24. 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".

25. 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 the UBA, UCLL or SLU services from Chorus. These services are regulated under the Act.

26. 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.

27. 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.[12]

28. When Chorus provides the UBA service, Chorus handles the broadband traffic between the end-user and the handover point on behalf of the RSP. That is, Chorus manages and provides access to the local loop, the exchange or cabinet (and the equipment in it, including a DSLAM), and the aggregation path to transport the broadband traffic to the "data switch" containing the handover point. The UBA service allows a RSP to offer a broadband service to end-users without needing to install its own broadband equipment. It is the cost that unbundlers avoid by installing their own DSLAM equipment in Chorus exchanges and/or cabinets.

Process to date

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

29. Prior to the structural separation of Chorus and Telecom on 1 December 2011, the Act provided for the UBA price to be determined on a "retail-minus" basis. The telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011

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[10] 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.

[11] 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.

[12] The actual pace of migration remains uncertain.

(Amendment Act) changed the UBA pricing principles from retail-minus to a forward-looking cost-based price.

30. The new IPP required us to set a benchmarked price based on prices in comparable countries. The Amendment Act froze the retail-minus prices for three years, so that the new forward-looking cost-based price would only apply from 1 December 2014.[13] The frozen retail-minus price for the UBA increment was $21.46.

31. On 5 November 2013, we set IPP prices for the additional cost component of the regulated monthly recurring UBA service charges as follows:[14]

	UBA additional cost component ($)	**UCLL component ($)[15]**	**Total monthly price ($)**
BUBA	10.92	23.52	34.44
EUBA 40	13.25	23.52	36.77
EUBA 90	13.82	23.52	37.34
EUBA 180	14.85	23.52	38.37

32. In December 2012 we also set a new IPP price for the UCLL service monthly charge.

Our consultations during the process to determine TSLRIC cost-based prices for the UBA service

33. In January 2014 we received five applications for a pricing review determination of the prices we set for the UBA service.[16] We also received applications for a pricing review determination in accordance with the UCLL FPP in February 2013.

34. Chorus, in parallel with its FPP application, appealed our UBA IPP determination to the High Court under section 60 of the Act. Chorus' appeal was dismissed,[17] as was Chorus' subsequent appeal of the High Court judgment to the Court of Appeal.[18]

35. In February 2014 we released a UBA process and issues paper, which set out our preliminary view on the modern equivalent asset (MEA) for the additional costs

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13 Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011, s 77(2).

14 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 section 30R of the Telecommunications Act 2001" (5 November 2013), NZCC 20, paragraph [7].

15 The UCLL component was determined by our December 2012 UCLL IPP.

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

17 *Chorus v Commerce Commission* [2014] NZHC 690.

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

component of the UBA service, and our proposed timetable for completing the FPPs for the UBA and UCLL services by 1 December 2014.[19] We also sought the views of parties on the conceptual issues associated with the TSLRIC methodology raised in the December 2013 process and issues paper on the UCLL service, but in relation to the UBA service.[20]

36. From this point on, we have since consulted on issues for the UCLL and UBA services at the same time. Our consultation process, as outlined below, has been a critical factor in developing the reasoning that underlies our thinking to date.

37. Following our consideration of submissions and cross submissions, in March 2014 we published further consultation papers which sought views on:[21]

    37.1 the role of relativity in our price setting process;[22] and

    37.2 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.

38. 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.[23]

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

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

    39.2 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.

40. 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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19 Commerce Commission "Determining a TSLRIC price for Chorus' unbundled bitstream access service under the final pricing principle – Process and issues paper" (7 February 2014).

20 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).

21 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.

22 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.

23 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.

41. 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.[24]

42. In June 2014 we published a TSLRIC literature review on UBA and UCLL costing, prepared by TERA.[25]

43. In July 2014, we published a regulatory framework and modelling approach paper, seeking views on:[26]

    43.1 our preliminary view of the regulatory framework for our UCLL and UBA TSLRIC cost modelling exercise;[27]

    43.2 our preliminary views on a number of fundamental assumptions for the development of a TSLRIC cost model for the UCLL and UBA services;[28]

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

    43.4 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

    43.5 expert papers prepared by Professor Ingo Vogelsang and TERA.

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

45. In September 2014 we published an open letter to parties in response to concerns expressed in submissions and cross submissions on our July 2014 regulatory framework and modelling approach paper.[29] We highlighted that:

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

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[24] 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 was 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 proposals received, we identified TERA as our preferred consultant.

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

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

[27] 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.

[28] Including the choice of the MEA, demand, depreciation, tax, price profiles, and cost allocation.

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

45.2 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

45.3 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.

46. Also in September 2014 we released a consultation paper on our proposed approach to setting prices for non-recurring charges for UCLL and UBA.[30]

47. In December 2014 we published our draft determination paper for the UBA service.[31,32] The draft total monthly price the Basic UBA service was $38.39.

48. In December 2014 we also published our draft determination paper for the UCLL service. Our draft decisions were (i) the monthly rental price for the UCLL service was $28.22, and (ii) the monthly rental price for the SLU service was $14.45.[33]

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

50. We highlighted that these prices were not final, as there were a number of matters that we still needed to work through with industry that could impact on the final prices.[34]

51. On 19 December 2014, we published a process and issues update paper for UCLL and UBA pricing review determinations where we:[35]

51.1 provided an update on the process, including responding to extension requests, ie, we granted an extension of one month for submissions on the UCLL and UBA draft determinations, to allow interested parties to make considered submissions; and

51.2 shared our emerging views and sought submissions on backdating.

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30 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.

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

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

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

34 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.

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

52. We received submissions and cross submissions on our December 2014 draft determination papers for UBA and UCLL services between February and May 2015.[36,37]

53. On 2 April 2015 we published a paper:[38]

    53.1 outlining the process and agenda for the upcoming conference; and

    53.2 updating parties on our approach to testing and quantifying the need for any potential uplifts to the TSLRIC price 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.[39]

54. On 14 April 2015 we published:

    54.1 a report from TERA with questions regarding Chorus' model;[40] and

    54.2 a report from Analysys Mason on Chorus' UCLL and UBA models.[41]

55. 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.

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

Criticisms regarding our process

57. Chorus favoured a speedier decision making process,[42] while Wigley and Company argued that our process is being conducted too quickly. [43,44]

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36 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).

37 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]).

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

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

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

41 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.

58. Wigley and Company also submitted that:[45]

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

    58.2 we have not properly engaged with its submissions; and

    58.3 our draft decisions are not accompanied by proper reasons.

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

    59.1 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;

    59.2 we are not required to hold a conference after this further draft determination[46]. 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;[47] and

    59.3 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.

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42 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].

43 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].

44 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.

45 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.

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

47 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, either consult those persons or hold conferences in relation to the matter" (emphasis added).

60. Wigley and Company also argued that we must quantify the impact of our decisions.[48] Our view is that we should quantify the benefits and detriments of our decisions only where feasible and useful.

61. 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.

62. 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:

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

    62.2 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

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

64. 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).

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

    65.1 geo-spatial data from Corelogic and Landcare Research;

    65.2 trenching and duct cost data from Beca; and

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

66. 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.[49]

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[48] 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).

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

67. 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.[50] We also note that interested parties have supplied their own data and models.

Structure of this document

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

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

    68.2 Chapter 2 explains our approach to determining the cost of providing the UBA 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.

    68.3 Chapter 3 explains how we propose to convert TSLRIC costs into a monthly unit price, and set the prices for the UBA service variants.

    68.4 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.

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

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

69. The Attachments to this further draft determination (and the Attachments of the UCLL July 2015 further draft determination where relevant) discuss in more detail our proposed approach, and reasons for our approach, to determining key inputs to our TSLRIC model.

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

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

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

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

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

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

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

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

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

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

70.9 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";

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

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

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

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

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

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

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

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

Next steps

72. Our indicative dates for the UBA 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

73. 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

74. 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 UBA service.

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

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

77. 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.

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

79. 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

80. 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

81. 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:

    81.1 confidential information in submissions should be clearly marked;

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

    81.3 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 UBA pricing review determination

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

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

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

    82.3 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;

    82.4 the concept of a MEA;

    82.5 other relevant considerations;

    82.6 additional legal requirements under the Act; and

    82.7 our views in relation to the *Vodafone TSO* case.[51]

We must determine a price in accordance with TSLRIC

Introduction to TSLRIC

83. 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);[52]

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

85. The FPP for the UBA service is:[53]

> The price for Chorus's unbundled copper local loop network plus TSLRIC of additional costs incurred in providing the unbundled bitstream access service.

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

52 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.

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

86. We take the price for the UCLL service[54] and add to it the TSLRIC of the additional costs incurred in providing the UBA service. In this further draft pricing review determination we are only pricing the "additional costs" component of providing the UBA service (which is the "UBA increment").

87. 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.

88. The Court of Appeal recently commented, in Chorus' challenge of our IPP determination for the UBA service, that:[55]

> 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.

89. We set out below the elements of TSLRIC's 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,[56,57,58] 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.

90. 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

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54 As further explained in Attachment B (MEA for UBA), we have modelled the modern equivalent asset (MEA) for the UBA service based on an underlying copper access network.

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

56 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]. This paper is relevant to this UBA pricing review determination process, as we have been jointly consulting on common issues for the UBA and UCLL pricing reviews. In February 2014 we issued a UBA process and issues paper, which indicated that the December 2013 UCLL process and issues paper should be read in conjunction with that paper (Commerce Commission "Determining a TSLRIC price for Chorus' unbundled bitstream access service under the final pricing principle – Process and issues paper" (7 February 2014), paragraph [8]).

57 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].

58 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].

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.

91. There are a number of different options for modelling the costs of the UBA service that would be consistent with the Act's definition of TSLRIC. Although the Act provides us with some guidance, we must exercise our judgement in choosing among those options.

92. As we explain later in this Chapter, the requirement to set a price in accordance with TSLRIC has led us to model the costs of a MEA as the basis for setting the price.

93. In broad terms, and for the reasons explained below, our approach to determining a price in accordance with TSLRIC for the UBA 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.

The Act's definition of TSLRIC contains several elements

94. 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:

    94.1 forward-looking costs;

    94.2 over the long run;

    94.3 of the total quantity of the facilities and functions;

    94.4 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

    94.5 a reasonable allocation of forward-looking common costs.

95. 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.

96. We discuss each of those elements further below.

Forward-looking costs

97. The Act does not define forward-looking costs.[59]

[59] 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

98. In 2002, we defined forward-looking costs as:[60]

> …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.

99. In the December 2013 UCLL process and issues paper, we defined the concept of forward-looking costs as follows:[61]

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

100. 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.

101. 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

102. 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.[62] We noted that, over this timeframe, all factors of production including capital equipment are variable in response to changing demand.

103. 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

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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.

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

61 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] and Commerce Commission "Determining a TSLRIC price for Chorus' unbundled bitstream access service under the final pricing principle – Process and issues paper" (7 February 2014), paragraph [8].

62 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].

such that all costs are considered variable in response to changes in demand.[63] The Australian Competition & Consumer Commission (ACCC) has noted that this is a time period in which "all necessary investments must be replaced".[64] 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".[65]

Total service, incremental costs

104. 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.

105. 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.[66] 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.[67]

106. 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.

107. 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 UBA 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).

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63 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].

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

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

66 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].

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 [65].

108. 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.

109. 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

110. The Act's definition of TSLRIC covers both:

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

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

111. 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:[68]

111.1 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.

111.2 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.

112. 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

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

[68] 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].

113.1 efficiently incurred; but

113.2 not directly attributable to providing an additional unit to that service.

114. 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.

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

116. 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.

117. 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 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

118. 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". The TSO instruments are relevant to the UCLL service (by which we mean both the UCLL STD service and the sub-loop UCLL service described in the SLU STD), but not the UBA service. The TSO instruments are explained in Chapter 1 of our UCLL July 2015 further draft determination.

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

Potential TSLRIC objectives/outcomes

119. 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.

120. 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.

121. 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.

122. 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.

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

123.1 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.[69]

123.2 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

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

objectives/outcomes of a TSLRIC-based access price,[70] including promoting efficient entry and exit; supporting incentives for efficient investment in, and use of, infrastructure; providing incentives for cost minimisation; allowing for efficient cost recovery; and mitigating non-discrimination.[71]

123.3 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.[72]

123.4 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.[73]

The role of TSLRIC objectives/outcomes in our modelling decisions

124. 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.[74] 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.

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

126. 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.

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70 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] and Commerce Commission "Determining a TSLRIC price for Chorus' unbundled bitstream access service under the final pricing principle – Process and issues paper" (7 February 2014), paragraph [8].

71 ACCC "Access Pricing Principles – Telecommunications, a guide", 1997, pp. [29-30], emphasis in original.

72 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].

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

74 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].

127. 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.[75] 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.

128. 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 focusing on the objectives/outcomes *per se*.

129. 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

130. 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.[76]

131. 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 as an independent consideration.[77] However, we continued to give weight to providing for predictability in our implementation of TSLRIC, which we considered

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[75] 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.

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

[77] 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].

could be provided for by adopting what is considered an orthodox approach to TSLRIC internationally.[78]

132. 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:

132.1 we had placed disproportionate weight on or prioritised the objective of predictability in respect of our modelling decisions;[79]

132.2 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;[80] and

132.3 predictability as a concept is meaningless when we are undertaking our first determination of FPP prices for the UCLL and UBA services.[81] 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.[82]

133. In contrast, Chorus supported adopting predictability as an objective, and giving weight to this by implementing an orthodox approach to TSLRIC.[83] In addition, Chorus submitted in response to the criticisms set out above that:

133.1 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;[84]

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78 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].

79 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].

80 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]

81 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].

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

83 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].

84 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].

133.2 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;[85] and

133.3 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.[86]

134. 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.

135. Spark submits that a predictable regulatory framework is a "laudable objective" that we should strive for in New Zealand's framework and processes;[87] Vodafone accepts regulatory predictability as a "desirable" regulatory objective;[88] and WIK refers to regulatory predictability as "highly important as an objective as good governance of regulation".[89]

136. 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.[90] Providing a predictable regulatory 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.

137. 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

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85 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].

86 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].

87 Spark "UBA and UCLL FPP pricing review draft decision" 20 February 2015, paragraph [151].

88 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].

89 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].

90 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].

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.

138. 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 and UBA draft determinations. 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.

139. We also agree with submitters that regulatory predictability is best considered at a higher level,[91] 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.[92] 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)

140. 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.

141. 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.

142. 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)".[93] 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

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

92 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].

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

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.

143. 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.

144. 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.

145. 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.[94] 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.

146. 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

147. 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.

148. 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:[95]

> …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.

[94] *Chorus v Commerce Commission* [2014] NZHC 690 at [34].
[95] *Chorus v Commerce Commission* [2014] NZCA 440 at [153].

149. In the context of the IPP determination, it also stated (footnotes omitted):[96]

> [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.

150. 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.

151. 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.[97]

152. 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."[98] Similarly, Vodafone has submitted that "s 18 considerations cannot displace a proper analytical approach to determining TSLRIC." [99]

153. 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.

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

154. In the December 2014 UCLL and UBA draft determination papers we stated that we will consider section 18 throughout the process.[100] This relates in particular to

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

97 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].

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

99 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].

100 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].

considering the section 18 purpose statement in regards to each of the TSLRIC modelling choices we make throughout the process.

155. 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".[101] At the conference, Chorus stated that section 18 is a mandatory requirement in respect of "all discretions that the Commission is exercising",[102] while Vodafone noted that section 18 applies "to a range of functions that [we] perform", including in setting a TSLRIC price.[103]

156. 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.[104] Wigley and Company further stated at the conference that many modelling decisions can be determined "without regard to section 18".[105]

157. 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.

158. 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.

159. 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 necessarily have a "discernible",[106] or "separately observable",[107] effect at every decision point during the modelling process.

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

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

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

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

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

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

160. 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.

161. 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.

162. 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.

163. 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",[108] and Vodafone stated that section 18 may not have a role where judgements can be made on the best available evidence.[109]

164. 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 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

165. 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 UBA 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

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107 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].

108 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. [35].

109 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. [41].

we can consider whether we can better meet the section 18 purpose statement by considering an increase or decrease from the central TSLRIC estimate.[110] Because such an approach is based on the costs of erring from the best estimate of the forward-looking efficient costs of supplying the UBA 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.

166. 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

167. 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.

168. 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.

169. 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.[111]

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

171. 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;[112] Spark supports the hypothetical efficient operator approach as pointing to a solid foundation for the TSLRIC model;[113] Vodafone submits that "there is general agreement that TSLRIC must reflect the price of a hypothetically efficient operator

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110 Also, as discussed in more detail in Chapter 4 of our July 2015 UCLL further draft determination, 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.

111 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].

112 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].

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

(HEO) deploying a network using modern equivalent assets (MEA)" [114]; 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".[115]

172. Where submitters appear to differ in their views is in how the hypothetical efficient operator concept is characterised in regards to the TSLRIC modelling. For example, Chorus characterised the hypothetical operator as a replacement for Chorus without access to Chorus's assets.[116] In contrast, Network Strategies has characterised the hypothetical operator as an operator that would seek to re-use assets that were available.[117]

173. 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

174. 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.[118] 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 notes, this implies that "outdated technologies and inefficiently incurred costs like redundant manpower are not reflected".[119]

175. 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

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114 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)".

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

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

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

118 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.

119 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].

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.

176. As explained above, in this further draft pricing review determination we are only pricing the "additional costs" component of providing the UBA service (which is the "UBA increment"). As explained in Attachment B (MEA for UBA), we have modelled the MEA for the UBA service based on an underlying copper access network. Therefore, the concept of TSLRIC only applies for the "UBA increment".

177. 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)[120], 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".[121]

178. 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".[122]

179. 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.

180. The economics literature also supports the proposition that the conventional TSLRIC concept (and its variant TELRIC) is implemented based on the assumption of a

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120 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).

121 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.

122 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].

hypothetical network being built from scratch using modern efficient technology. For example:[123]

180.1 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";[124]

180.2 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";[125]

180.3 Ergas refers to "the "thought experiment" underlying TSLRIC as "the hypothetical builder of a new, wholesale only, network";[126]

180.4 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".[127]

181. 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:

181.1 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:[128]

> "…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".

181.2 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

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123 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.

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

125 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.

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

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

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

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"[129] and that "ComReg believes that the BU-LRAIC methodology should reflect assets of a new network".[130]

182. Along similar lines, in a 2013 submission on behalf of Vodafone to MBIE, Network Strategies summarised standard practice in respect of TSLRIC modelling:[131]

> "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

183. 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".[132] At the conference, Chorus referred to the concept of a hypothetical efficient operator as a "tool", and "not an end [unto] itself".[133] 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.

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

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

130 *Ibid*, paragraph 4.177.

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

132 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].

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

185. 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.

186. 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.

187. 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.

188. 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".[134] 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.

189. 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.

190. 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.

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[134] "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. For instance, we consider that the Resource Management Act 1991, as amended ("the RMA"), is a relevant consideration for this further draft determination. [135] In order to be able to determine what impact, 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

192. 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 has 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".[136] 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.

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

193.1 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;[137] and

193.2 The approach is regarded as avoiding the risk of over-recovery of costs of re-useable legacy civil infrastructure.[138]

194. As a preliminary point, we note that the TSLRIC methodology is not prescribed by European law.[139] While the Access Directive requires national regulatory authorities

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135 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.

136 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].

137 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.

138 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].

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

to consider imposing price control where there is a lack of effective competition,[140] 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.

195. 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:

195.1 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

195.2 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.[141] 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".[142] 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.

196. 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.[143] 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

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

141 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".

142 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].

143 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.

generation networks has been facilitated by the government-subsidised UFB programme for such investment and operator migration to the new networks.[144]

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

198. 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.

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

199.1 We are setting a TSLRIC-based price in the factual context of a competing fibre network being built, facilitated by government subsidy,[145] 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 proportion of its customers will migrate away to fibre before costs can be recovered;[146]

199.2 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

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144 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).

145 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.

146 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.

to recover the costs of those assets.[147] In contrast, in New Zealand there has been no previous bottom-up cost modelling approach used to determining Chorus' regulated access prices.[148]

200. 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.

201. 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]).

202. The *Vodafone TSO* case concerned the "cost to Telecom acting efficiently"[149] 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.

203. In this further draft 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 (as explained above, this rationale applies for the "UBA increment" only).

204. 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.[150] 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.[151]

205. 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

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147 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].

148 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.

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

150 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].

151 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].

strong case to follow the EC and move away from the conventional approach to implementing TSLRIC.[152]

206. 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.

207. 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.

208. 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.

209. 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 re-visiting 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 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

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

211. As further explained in Chapter 2 and Attachment B (MEA for UBA), the MEA for UBA is dependent on the underlying access network that the hypothetical efficient operator supplies the service over.

212. The final pricing principle for the UBA service directs us to consider the TSLRIC for the "additional costs" component of the UBA service.

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.

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[152] 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).

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 UBA 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.

216. The further draft UBA price is comprised of the underlying UCLL price and the cost we determine for the "UBA increment" (to which we apply TSLRIC). The UBA 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.

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

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 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.[153] Similarly Vodafone submitted that an assessment of the evidence can be used to answer some modelling questions.[154]

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 UBA services, which we now discuss.

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153 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p.35.

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

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 UBA service is Chorus, so we take into account the prices Chorus receives for the designated and specified services that Chorus provides.

225. The UBA price we set must not allow Chorus to recover costs that it recovers in the prices of other "designated services"[155] and "specified services"[156] it provides.

226. We will also allocate the costs we are currently modelling for the UBA service to avoid double recovery of those costs in the prices we set for the UCLL 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 an 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 110-117) 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.

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155 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.

156 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.

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. 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.

232. 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 in regard to UCLL and so averaging them was the easiest and most efficient way to produce the necessary single price.

233. 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.

We must set an expiry date

234. In this further draft further determination, we must propose an expiry date.[157][158]

235. 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.[159] We have re-stated those views in our December 2014 UCLL and UBA draft determination papers and here, which continue mostly to hold.

236. It is not clear from the Act what prices will apply for the UBA STD at the expiry of the UBA pricing review determination (ie, the determination we are currently in the process of making).

237. We would expect to amend the STD to update the UBA price 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.

238. 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).

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157 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.

158 The expire date relates to the price we are setting in this price review determination process. There is no expire date for the UBA STD.

159 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.

239. 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.

240. Chorus' submission on the December 2013 UCLL process and issues paper sets out its understanding of that proposed approach to the expiry date.[160] 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 UBA model itself might need to be updated as part of amending the STD to update the UBA price before the expiry of the pricing review determination.[161]

241. We set a regulatory period, which has two important roles in a TSLRIC cost model:[162]

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

    241.2 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.

242. 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

243. 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.[163]

244. 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

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160 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].

161 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].

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

163 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].

reference to the possibility of backdating of the determination.[164] 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.

245. 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.

246. In our July 2014 regulatory framework and modelling approach paper, we outlined our preliminary view that:

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

246.2 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.[165]

247. 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:

247.1 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.

247.1.1 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:[166]

> … 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).

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164 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].

165 Telecommunications Act 2001, s 19(b) and Schedule 1, Part 2, Subpart 1.

166 Telecommunications Act 2001, Schedule 3, clause 1(3).

247.1.2 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.

247.2 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.

247.3 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).[167]

247.4 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.[168]

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

248. 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.

249. 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.[169,170] 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.[171] Chorus re-iterated that it would like a longer regulatory

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167 Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [321].

168 Telecommunications Act 2001, s 157AA.

169 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.

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

171 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].

period, and suggested a compromise of seven years, in order to balance regulatory and pricing stability.[172]

250. 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.[173] 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.[174] 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.[175]

251. 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.

252. 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.

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

254. 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).

255. 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:[176]

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172 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].

173 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].

174 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].

175 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].

176 Telecommunications Act 2001, s 30B.

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).

256. 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.

257. We have also considered the potential for Chorus to introduce commercial services that are not subject to the UBA STD, and if so what steps, if any, we could take to ensure our UBA pricing review determination addresses clause 4B in these circumstances. In particular, we have considered how to address changes to cost allocation between regulated services and any future commercial bitstream variants (such as the cost of the fibre link between the DSLAM and the FDS). Our view is that we could undertake a section 30R review if and when it is deemed necessary to update the UBA price to address this issue.

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.

Our views in relation to the *Vodafone TSO* case

260. Submissions were exchanged about whether the *Vodafone New Zealand Ltd v Telecom New Zealand Ltd* (the *Vodafone TSO* case)[177] was a relevant or binding consideration for this process. We express our view on the applicability of this case below.

261. 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

[177] *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.[178]

262. 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.[179] 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."[180]

263. 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."[181]

264. 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:

    264.1 We had failed to adjust its model to allow for the introduction of mobile technology that would be used by an efficient service provider.[182]

    264.2 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.[183]

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

266. 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".[184]

267. 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).

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178 At [1].
179 Section 5.
180 Section 84(1).
181 At [82] per Tipping J.
182 At [9] and [17] per Elias CJ; and at [74]-[76] per Blanchard, McGrath and Gault JJ.
183 At [70]-[72] per Blanchard, McGrath and Gault JJ and [81] per Tipping J. Elias CJ declined to express a view: [15].
184 At [70] per Blanchard, McGrath and Gault JJ.

268. In terms of service, the UBA is a layer 2 service, which means that it is different to the access network being the network for which the net cost was calculated over and as such requires different technical and network inputs as it provides a different service.

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

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

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

269.2.1 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

269.2.2 calculating the UBA increment on a forward looking TSLRIC basis which incorporates the most current and up-to-date technology for the provision of UBA over the network that is currently available in NZ.

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

269.3.1 The *Vodafone TSO* case concerned the "cost to Telecom acting efficiently" to supply the TSO service to CNVCs.[185]

269.3.2 In contrast, for the UBA service, 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.[186]

269.3.3 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.

270. We are therefore satisfied that we have constructed an appropriate model for determining the cost of the UBA service that is fit for purpose.[187] 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.

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

186 At [70] per Blanchard, McGrath and Gault JJ.

187 Cf [73] per Blanchard, McGrath and Gault JJ.

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

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

272. As explained in Chapter 1:

272.1 In this further draft pricing review determination we are pricing the "additional costs" component of providing the UBA service (which is the "UBA increment");

272.2 To calculate the price of these "additional costs" we determine the TSLRIC providing the UBA service; and

273. Our 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 UBA network using modern assets as they relate to the "additional costs" component of providing the UBA service. We have taken the following steps to determine the cost for the UBA service:

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

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

273.3 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.

273.4 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 UBA service, which is discussed in Chapter 3.

274. We have engaged TERA Consultants to build the cost model for the UBA (and UCLL) 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 UBA service. 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 UBA service.

275. Having consulted extensively and considered submissions, we set out below our key further draft decisions on our approach to modelling the cost of the UBA service. We have relied on the expert advice from TERA in developing the cost model which is used to set the further draft price for the UBA service.[188]

276. The cost model consists of five parts:[189]

276.1 Geo-spatial data processing – determines all cable paths from the end-user dwellings to the network nodes;[190]

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

276.3 Access network model – once the access network is dimensioned, costs are derived by multiplying the network inventory by the unit costs;[191]

276.4 Opex model – based on Chorus' financial information, the opex and non-network costs are derived for each service; and

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

277. As mentioned above, the scope of this further draft determination is limited to determining the cost of the "UBA increment". The cost of the "UBA increment" is determined in the UBA network model which covers the provision of the UBA service from the MDF to the FDS (as highlighted in green in Figure 1 below).[192]

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

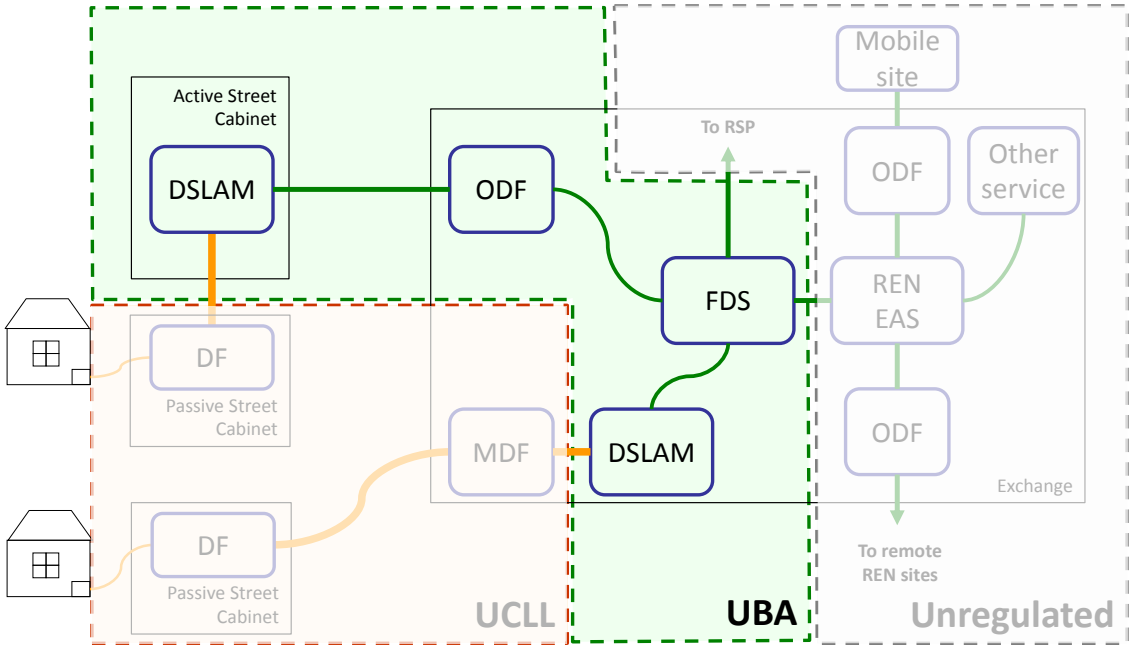
189 For a full description detailing the specification of the cost model see TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: - Model Specification" June 2015.

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

191 Parts of the UBA increment are determined in the access network, for example, the local aggregation paths between the exchange and first data switch.

192 The TSLRIC modelling of the UBA service follows a similar approach to Figure 1 of the UCLL further draft determination.

Figure 2: Core network model scope



278. The reasons for our further draft decisions are included in the Attachments to this further draft determination and in some of the Attachments of the UCLL July 2015 further draft determination.

279. Matters of a more technical nature are addressed in TERA's review of submissions document, which we have published alongside this further draft determination.[193] 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 network footprint for the UBA service

280. The hypothetical efficient operator network footprint determines the number of connections that comprise the network, and informs where the hypothetical network will be deployed. Our objective, in setting the hypothetical efficient operator's network footprint, is to establish an appropriate scale for the provision of the UBA service that (in conjunction with demand) results in an average unit cost that meets our TSLRIC objectives/outcomes and section 18 purpose statement.

281. Consistent with our earlier draft, our view is that an appropriate scale operator's UBA network footprint should connect only active UBA connections. Accordingly, the hypothetical efficient operator's network footprint connects every address with an active UBA connection.

193 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.

282. Modelling a UBA network footprint that connects all active bitstream fixed lines (cable, fibre, FWA, etc), or alternatively, connects all address points (as per our modelled UCLL network footprint) would set an inappropriate scale for the hypothetical efficient operator, which (all else held constant) would increase the cost of the UBA increment and incentivise inefficient entry by way of unbundling.

283. Attachment A provides further detail on our reasoning and analysis in respect of our further draft decisions regarding the network footprint.

Determining the modelled network

284. Having established the network footprint for UBA we then consider what the MEA for the UBA service would be. We have then considered how the hypothetical efficient operator would deploy that network, including the level of optimisation employed relative to Chorus' copper network.

Selecting the MEA for the UBA service

285. As explained in Chapter 1 and noted above, the MEA for the UBA service is relevant only for determining the TSLRIC of the "additional costs" component of the UBA service; the price for the UCLL component is set in accordance with the UCLL pricing principle.

286. While the MEA for UBA is dependent on the underlying access network that the hypothetical efficient operator supplies the service over, we are no longer of the view that we are restricted to presupposing that the underlying access network is Chorus' copper network. Accordingly, we have considered the following two options for determining the MEA for the UBA service:

    286.1 Option 1 – a UBA network that is built over an optimised access network that replaces the existing copper network; and

    286.2 Option 2 – a UBA network that is built over the existing copper access network.

287. While we consider that both approaches would utilise an Ethernet based layer 2 aggregation network to transport the data traffic to the handover point, the active equipment required and the distance to the handover point is likely to differ.

288. Option 1 assumes that the hypothetical efficient operator deploys an efficient replacement network from the end-user to the handover point of the UBA service. That is, the hypothetical efficient operator replaces both Chorus' copper network and core network to the handover point of the UBA service.

289. Given we have modelled an efficient replacement network for Chorus' copper network in the UCLL pricing review determination, under Option 1, we consider it reasonable to assume that this is the underlying access network on which we then determine the MEA for the UBA service.

290. Accordingly, given that the underlying access network is exchange-based only, the scope of the MEA for the UBA service in this case includes:[194]

290.1 optical network terminals to aggregate end-user traffic at the exchange;

290.2 backhaul from the exchange to the handover point; and

290.3 Ethernet aggregation switch equipment at the handover point.

291. Option 2 assumes that the hypothetical efficient operator utilises Chorus' copper network and the MEA for the UBA service is an efficient core network deployed from the MDF to the handover point of the UBA service.

292. In this case, the scope of the MEA for the UBA service includes:

292.1 DSLAMs to aggregate end-user traffic at the MDF;

292.2 backhaul from the cabinet to the exchange for cabinet based end-users;[195]

292.3 backhaul from the exchange to the handover point; and

292.4 Ethernet aggregation equipment at the handover point.

293. In considering the two potential options above, we have selected our MEA for the UBA service having taken into account our TSLRIC objectives/outcomes, section 18 considerations, and the requirement to consider the relativity between the UCLL and UBA services.

294. We consider that a MEA for the UBA service that presupposes an underlying copper access network will likely better allow for competition through unbundling where it is efficient. This is because decisions regarding unbundling are made in respect of the existing copper network, and so a MEA for the UBA service that utilises an underlying copper access network better aligns efficient build/buy decisions with those made in the real world, compared to the case with an alternative MEA built over an optimised access network.

295. Accordingly, on balance, our view is that section 18 purpose statement, and the requirement to consider relativity between the UCLL and UBA services, under section 19(b) of the Act, leads us to prefer a MEA for the UBA increment that utilises a copper access network. Therefore, we have modelled the MEA for the UBA service based on an underlying copper access network.

296. In terms of relativity we have considered the reality of the situation; which is that there is an underlying copper access network in place and we need to be mindful of

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194 Note that this is not a complete list of the additional costs incurred but an illustration of the scope of the UBA increment.

195 We note that, in the case of a different underlying access network being used to price the UCLL service, we need to take into account whether the cost of this portion of the network is recovered by the UCLL price.

the level of the impact this could have on relativity between UCLL and UBA if we were to model a MEA for the UBA service over a fibre access network.

297. While we have set the cost of the UBA increment using a MEA for the UBA network that utilises an underlying copper access network, we have also modelled the cost-based on an underlying fibre access network. We note that there is minimal difference in the cost of the UBA increment between the two approaches.[196]

298. Attachment B provides further detail on our reasoning and analysis in respect of our further draft decisions regarding the MEA for UBA.

Optimising the network we have modelled

299. 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.

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

301. We have not optimised the core network by eliminating or removing FDS as this does not amount to optimisation in an efficient sense. Changing the number of "handover points" simply shifts how much of the local aggregation path from the FDS to the DSLAM is included in the UBA increment and how much the access seeker will have to pay for separately. The total cost of the network may not be changing materially as a result.

302. We have modelled the size of exchange buildings based on a bottom-up calculation of the required space and equipment. The main reasoning for this is that basing the calculation of the size and therefore the 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.

303. The active assets in the core model have been optimised based on the relevant demand. The main reasoning for this is that this optimisation reflects the modern assets being modelled.

304. Attachment C provides further detail on our reasoning and analysis in respect of our further draft decisions regarding network optimisation.

Demand over the regulatory period

305. The hypothetical efficient operator's demand determines the number of connections over which total modelled costs will be spread. Our objective, in setting the

[196] A switch is included in the UBA model that allows users to switch between a copper and fibre underlying access network.

hypothetical efficient operator's demand, is to establish an appropriate scale for the provision of the UBA service that (in conjunction with the network footprint) results in an average unit cost that meets our TSLRIC objectives and section 18 purpose.[197]

306. As we have stated in the December 2014 UBA draft determination paper, we remain of the view that an appropriate scale operator would serve all active UBA connections because this will be more likely to achieve a position of competitive neutrality, where unbundling will occur if it is efficient to do so.

307. 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.

308. There are a number of factors that determine the demand for regulated UBA. 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.

309. Our December 2014 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 effect of competition.

310. Accordingly, we have maintained our earlier draft decision that there is no demand growth or migration the hypothetical efficient operator's connections.

311. Our modelling decisions 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 UBA connections, 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".[198]

312. Unlike a UCLL access network, which although "fully-loaded" will always have more network connections than demand, the UBA network can be more flexible and better match connections and demand. Therefore, our assumption is that our UBA hypothetical efficient operator can match demand to network connections. Accordingly, our hypothetical efficient operator's UBA network is fully-loaded.

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197 Throughput requirement which is the average minimum bandwidth each UBA end-user demands during busy hour, is an independent modelling parameter addressed in Attachment B.

198 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 Chorus' active UBA connections.

313. 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.

314. Attachment A provides further detail on our reasoning and analysis in respect of our further draft decisions regarding the demand for UBA.

Infrastructure sharing in the core network

315. In our December 2014 UBA draft determination paper we did not consider the possibility of the hypothetical efficient operator sharing underground infrastructure with utility companies. Therefore, our TSLRIC model did not incorporate any sharing of underground infrastructure with utility companies.

316. After reviewing submissions on this topic, we have concluded that infrastructure sharing is a relevant factor for the UBA service. We consider the hypothetical efficient operator would seek such efficiencies in relation to the local aggregation path (LAP), which covers the trench and duct between the DSLAM and FDS locations.

317. We propose to include 5% of underground infrastructure sharing with utility companies.

318. The main reasoning for this is:

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

    318.2 including infrastructure sharing in the model reflects what currently happens in New Zealand and overseas.

319. Attachment D of this further draft determination provides further detail on our reasoning and analysis in respect of our further draft decisions regarding infrastructure sharing.

Determining the cost of the modelled network

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

Asset valuation

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

322. 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.

323. 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 UBA 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 UBA 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.

324. 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.

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

326. Attachment E provides further detail on our reasoning and analysis in respect of our further draft decisions regarding asset valuation.

Weighted average cost of capital

327. We are required to set forward-looking cost-based access price for the UBA service using a TSLRIC methodology. WACC is one of the key inputs to the TSLRIC models for UBA, and represents the risk-adjusted return on capital employed in supplying the service.

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

329. The parameters used to generate our mid-point post-tax WACC estimate of 6.03% for UBA 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%**

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

331. Compared to the December 2014 UBA draft determination paper:

331.1 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;

331.2 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;

331.3 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

331.4 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%.

332. 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

333. Our TSLRIC model for the UBA 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.

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

334.1 to provide for an *ex ante* allowance for the asymmetric risk of catastrophic events, through the use of Chorus' insurance costs and other costs which we consider are appropriate for the likely costs incurred by our hypothetical efficient operator to efficiently and prudently insure against catastrophic risk;

334.2 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;

334.3 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

334.4 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.

335. Attachment F provides further detail on our reasoning and analysis in respect of our further draft decisions regarding asymmetric risk.

Depreciation

336. 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 UBA 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.

337. 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.[199] 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).

338. 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.

339. Our further draft decision is to maintain the view that the tilted annuity method is the appropriate methodology for regulatory depreciation.[200] This approach combines an allowance for depreciation with the return on capital. We believe that tilted

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

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

annuities are consistent with the principles of financial capital maintenance and provide efficient incentives for build-buy decisions over time.[201]

340. Attachment G provides further detail on our reasoning and analysis in respect of our further draft decisions regarding depreciation.

Asset lives

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

342. Our further draft decision remains that Chorus' 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:

342.1 we consider that this further draft decision is consistent with our framework for carrying out the UBA 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

342.2 we consider the accounting asset lives provided by Chorus are an appropriate starting point for our further draft decision on asset lifetimes. We have used these as a proxy for the economic lives of the assets in our model.[202]

343. TERA then cross-checked these asset lives against TSLRIC models overseas. TERA selected international benchmarks where the asset lives provided by Chorus seemed out of line with what has been observed in other relevant jurisdictions, or if no data was provided.[203] We reviewed TERA's analysis and agree with its conclusions.

344. Attachment H provides further detail on our reasoning and analysis in respect of our further draft decisions regarding asset lifetimes.

Price trends

345. 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.

346. Our further decision is as follows:

346.1 For active assets using international benchmarks: Our decision remains that the Australian benchmark be used to determine price trends for active

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201 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.

202 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.

203 The asset identified was DSLAMs, and is further discussed in Attachment H.

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.[204]

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

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

346.2.2 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, to assess the ODF price trend which is used on the UBA increment calculation, a weighted average of LCI and fabricated steel indexes are used.

346.3 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:

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%)
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%)

[204] 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.

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

346.4 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%.

346.5 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.

346.6 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.

347. Attachment I provides further detail on our reasoning and analysis in respect of our further draft decisions regarding price trends.

Trenching costs

348. Trenching costs are relevant for the UBA service, as they apply to the LAP, which covers the trench and duct between the DSLAM and FDS locations.

349. We have sourced information regarding trenching and duct cost data from local costing experts Beca.[205] We consider that it is appropriate to rely on Beca's cost analysis for the calculation of trenching costs.

350. The main reasoning for this is:

350.1 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; and

350.2 given Beca's expertise and independence, we see no compelling reasons, at this stage, for changing our preliminary position.

[205] 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.

351. 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.

352. Attachment J provides further detail on our reasoning and analysis in respect of our further draft decisions regarding trenching costs

Capital contributions

353. We have considered and determined whether the hypothetical efficient operator would incur all of the capital costs of building the hypothetical UBA 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.

354. We have excluded the cost of RBI DSLAMs and the additional cost of active cabinets. We have excluded these costs as most of the real world subsidies received by Chorus went to providing fibre to RBI cabinets. This does not increase the TSLRIC cost, since the MEA already has feeder to cabinets and little additional cost of this is fibre. Additional costs of active cabinets and DSLAMs are attributable due to the RBI subsidy.

355. Attachment K provides further detail on our reasoning and analysis in respect of our further draft decisions regarding capital contributions.

Tax

356. 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.

357. 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.[206]

358. Attachment L provides further detail on our reasoning and analysis in respect of our further draft decisions regarding taxation.

Operating expenditure

359. Our TSLRIC model calculates the operating expenditure (opex) associated with the provision of the UBA service by our hypothetical efficient operator. Our further draft

[206] 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.

decisions and reasons in respect of opex are to start by utilising Chorus' financial accounts to determine the relevant opex for the UBA service. We consider that Chorus' operating costs are the best objective evidence of opex for a nationwide telecommunications network provider in New Zealand; and

360. Attachment M provides further detail on our reasoning and analysis in respect of our further draft decisions regarding opex.

Cost allocation

361. The Act requires us to include a reasonable allocation of forward-looking common costs in our TSLRIC model for the UBA 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).

362. Our further draft decisions and reasons in regards to how we allocate forward-looking common costs in our TSLRIC model for the UBA service are:

362.1 For network costs, we use a capacity-based allocation approach. 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 capacity-based allocation approach is implemented as follows:

362.1.1 For active assets, by using specific allocation keys identified for different categories of network costs. 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;

362.1.2 For the cost of the fibre link between the cabinet and the exchange, we lacked definitive data to undertake a capacity-based allocation approach. Based on TERA's recommendation (with which we agree), we allocated 100% of the cost to the bitstream services, so as to avoid double counting where costs have already been allocated to fibre leased lines;

362.1.3 For the cost of the fibre link between the exchange and the FDS, we again lacked definitive data to undertake a capacity-based allocation approach. We therefore used the method of equi-proportional mark-up (EPMU) that is modified to be based on revenue-shares, as we considered this to be a robust approach in the absence of definitive data for a capacity-based approach.

362.2 For non-network costs, we use the EPMU method, as 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:

362.2.1 For the allocation of non-network costs between the 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.

362.2.2 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.

363. Attachment N provides further detail on our reasoning and analysis in respect of our further draft decisions regarding cost allocation.

Chapter 3: Calculating the TSLRIC-based price for the UBA increment

Purpose

364. In the previous Chapter of this further draft determination, we determined the total annual TSLRIC costs for the UBA increment. In this Chapter we set out how we have converted that total annual cost to a monthly unit price of the UBA increment. We also describe how we set prices for the four different variants of the UBA service specified in the UBA STD, and our further draft decisions regarding the price profile over the regulatory period.

Our draft decisions

365. Our further draft decisions in regards to calculating a TSLRIC-based price for the UBA increment are:

365.1 We converted total annualised TSLRIC costs for the UBA increment to monthly unit TSLRIC costs for each of the five years, by dividing the annualised TSLRIC costs by 12, ie, the number of months in a year, and then by demand.

365.2 We determined price differentials between the four different variants of the UBA service specified in the UBA STD using a gradient approach. This approach uses price differentials that were determined in the UBA IPP determination, which we apply as percentage mark-ups to the monthly unit TSLRIC cost for the UBA increment (and also taking account of the distribution of customers across each of the UBA variants).

365.3 We set monthly nominal prices that differ over each of the five years in the regulatory period, ie, our further draft decision has changed from our approach in the December 2014 UBA draft determination paper where we levelised the monthly prices across the regulatory period.

366. Our further draft decision for the total UBA price (ie, UCLL price plus the UBA increment) for the four different variants of the UBA service is summarised in Table 4 below.[207]

Table 4: Nominal prices for BUBA and EUBA (NZ$)

	Year 1	Year 2	Year 3	Year 4	Year 5
BUBA	37.89	38.15	38.43	38.74	39.08
EUBA 40	40.27	40.49	40.74	41.01	41.32
EUBA 90	40.86	41.07	41.31	41.57	41.87
EUBA 180	41.91	42.11	42.33	42.58	42.87

[207] UCLL Price has been determined in the UCLL further draft pricing review determination published alongside this paper.

Source: Commission's TSLRIC model for further draft decision

Converting total annualised TSLRIC costs for UBA to monthly unit TSLRIC costs

367. In this section we explain how we have converted the total annualised TSLRIC costs for the UBA increment to monthly unit TSLRIC costs for each of the five years during the regulatory period.

368. Table 5 below shows the total annualised TSLRIC costs for the UBA increment based on our TSLRIC model for each of the five years during the regulatory period. These figures include an allocation of shared and common costs, as discussed in Attachment N – Cost allocation.

Table 5: Total annualised TSLRIC costs for the UBA increment based on our TSLRIC model, (NZ$, millions, nominal)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total annualised TSLRIC costs	152.18	149.71	147.41	145.33	143.52

Source: Commission's TSLRIC model for further draft decision

369. To calculate the monthly TSLRIC costs for each of the five years, we divided the annualised TSLRIC costs, as presented in Table 5 above, by 12, ie, the number of months in a year. We then divided these monthly costs by demand (as discussed in Attachment A – UBA network footprint and demand) to determine monthly unit TSLRIC costs.

370. Having derived this monthly unit TSLRIC cost for each year in the regulatory period, we then spread this cost across the four different variants of the UBA service, as described in the next section.

Determining prices for BUBA and EUBA

371. In this section we calculate the prices for the BUBA and EUBA variants based on the monthly TSLRIC unit costs for the UBA determined in the previous sections.

372. The UBA STD specifies four different variants to the UBA service: BUBA (also referred to as EUBA0) and three EUBA variants (EUBA40, EUBA90, and EUBA180), offering a real time class of service (CoS) in addition to the best efforts BUBA service. We refer to the four different variants to the UBA service collectively as the UBA variants.

373. The UBA variants were included within the UBA STD to enable access seekers greater flexibility in terms of the services they can support at the retail level. Alternative services would provide further opportunities for service differentiation and therefore are likely to promote competition for the long-term benefit of end-users in

telecommunications markets.[208]

374. Our TSLRIC cost model for UBA does not provide any cost differential between UBA variants. The main reason for this is that bandwidth is not a cost driver for UBA, and all the variants use the same DSLAM and the same backhaul. It is therefore difficult to identify real unit cost differences between the variants.

375. In the following sections we consider:

375.1 whether it would be appropriate to have set the same price for each variant; and

375.2 if it is not appropriate to set the same price, how we can determine different prices for the variants.

Should we set the same price for the different variants?

376. In our December 2014 UBA draft determination paper we considered that it was not appropriate to set the same price for each of the UBA variants.[209]

377. Chorus agreed with this view, and submitted that we should continue to provide differential pricing between the UBA variants.[210] While other submitters have submitted on the appropriate method for setting differential prices (as discussed further below), it appears that they do not dispute the need to set differential prices *per se*.

378. We consider that, with no price differential, there would be a tendency to switch to the highest-end variant at the same cost. [211] We also consider that the most efficient recovery of fixed costs is unlikely to be achieved through a single averaged price applying for each of the variants.

379. Accordingly, our further draft decision is that we should set differential prices for the UBA variants.

How we determine different prices for the UBA variants

380. In our December 2014 UBA draft determination paper we set out some different ways we could set prices for UBA variants.[212] We have already discussed one of these approaches above, which was to set the same price across the different variants (and

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208 Commerce Commission “Standard Terms Determination for the designated service Telecom’s unbundled bitstream access” 12 December 2007, Decision 611, paragraph [109].

209 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [341].

210 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 [230].

211 The highest-end variant refers to EUBA 180. This variant provides access to greatest share of dedicated bandwidth.

212 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraphs [338]-[364].

which we do not consider to be appropriate). The approaches for determining differential prices were to:

380.1 determine a price differential based on a price consisting of two components, ie, the price per customer plus a uniform price per Mbps; or

380.2 determine price differentials based on a gradient approach, whereby the difference between the prices for the variants is based on an appropriate gradient, in a way such that the average revenue from these products equals the average TSLRIC cost.

381. Attachment O (Alternative methods to set prices for UBA and EUBA) to this determination explains those alternatives in further detail.

382. In our December 2014 UBA draft determination paper, our preliminary decision was to determine price differentials based on the gradient approach.[213]

383. Chorus supported the use of the gradient approach (based on the gradient determined in the UBA IPP determination, which we discuss further below).[214] In contrast, Wigley and Company argued that the gradient approach is not legally open to us and the variants must be costs based. Wigley and Company also submitted that, if our TSLRIC model is not able to provide cost differences between the variants, then the model needs to be fixed to produce the answer.[215]

384. Similarly, WIK submitted that a gradient approach does not reflect the structure of costs, and so in applying this approach we are not applying a TSLRIC-based pricing approach.[216]

385. In its cross submission, Analysys Mason, on behalf of Chorus, submitted that a gradient approach is not a departure from TSLRIC and stated that a gradient approach has been used in LRIC models in Denmark and Sweden. Analysys Mason also considered the gradient approach as a simplified Ramsey mark-up.[217] In its cross submission, Chorus submitted that the gradient approach was appropriate because

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213 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraphs [348].

214 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 [231].

215 Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraphs [15.1]-[15.2].

216 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 [86].

217 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross-submission" CONFIDENTIAL, 20 March 2015, Section 3.11.

there is no specific cost-based evidence in New Zealand that can be used to differentiate the UBA variants.[218]

386. We disagree with Wigley and Company and WIK, and we consider the Act does not direct us to cost each variant individually. Rather, we are broadly required to determine the TSLRIC of the UBA service as a whole. How the costs making up the wider UBA service are allocated to different UBA variants is a matter for us to decide in accordance with our regulatory framework under which we set a price for the UBA service. We are comfortable that prices remain cost oriented under the gradient approach because the total cost of all the UBA variants is equal to the UBA TSLRIC costs. Accordingly, the gradient is simply a way to allocate the total UBA cost between the different variants.

387. We also emphasise that our model provides a TSLRIC cost, on average, across each of the variants. We therefore disagree with Wigley and Company, and do not consider there is any error in our model in this regard.

388. Moreover, we consider that the gradient approach is appropriate for the following reasons:

388.1 To the extent that the gradient reflects the different willingness to pay of end-users, then it likely promotes allocative efficiency, which is consistent with the TSLRIC objectives/outcomes (of providing incentives for efficient use of infrastructure) and the section 18 purpose statement.

388.2 The gradient approach is international practice, and is used in Denmark, Sweden and Belgium, for example.[219]

389. Our further decision therefore remains that we will determine prices for the UBA variants based on a gradient approach.

We determine the gradient based on benchmarking from the UBA IPP determination

390. In our December 2014 UBA draft determination paper we considered alternative ways to determine the gradient and our preference was to use the gradient based on price differentials determined in the UBA IPP determination.[220]

391. We invited submissions to our December 2014 UBA draft determination paper to provide any other alternatives to determine the gradient. Chorus supported the use

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218 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 [243].

219 Denmark and Sweden were the international benchmarks used in the UBA IPP determination, and Belgium was used as a cross check in the UBA IPP determination. At the conference, Analysys Mason noted that the countries that have thought most about this issue are Denmark, Sweden and Belgium (Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 286).

220 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [353].

of the gradient determined in the UBA IPP determination.[221] Spark and Vodafone did not provide any other alternative to consider determining the price differentials for the UBA variants, and at the conference indicated that they had no concerns in relation to this issue.[222]

392. Wigley and Company submitted that by benchmarking against the UBA IPP determination, the FPP does what it is designed to replace in the IPP.[223] Further, Wigley and Company submitted that benchmarking against the UBA IPP determination involves using only the Belgian benchmark, and ignores the Swedish benchmark (for which there is no price differential).[224]

393. While we agree with Wigley and Company that the FPP process is intended to replace the benchmarking approach in the IPP, in this instance we consider that a benchmarking approach is the best available option that is open to us, in the absence of pricing differentials determined by the cost model. We note also that, as discussed above, the total cost across the UBA variants remains based on the results of the TSLRIC cost model.

394. We also set out our reasons above why we consider it is not appropriate to have no price differential across the UBA variants, and these reasons are also applicable to why we have not chosen Sweden as a benchmark (where there is no price differential).

395. Accordingly, our further draft decision is that continuing with the gradient based on the UBA IPP determination is the best approach, given that TSLRIC model for UBA does not provide a cost differential for the variants.

396. In particular, in the UBA IPP determination we identified that Belgium has a wholesale bitstream transport service with a real time customer CoS profile.[225] In order to calculate the percentage difference for the additional cost of the EUBA variants, we have calculated the percentage mark-up of the costs required to provide a real time CoS in addition to the costs of providing a best effort CoS to the Belgian distant handover point.[226]

397. The gradient determined in the UBA IPP, based on Belgium, is presented in Table

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221 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 [231].

222 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 284.

223 Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraphs [15.9].

224 Wigley and Company "Cross submissions as to draft UCLL and UBA FPP determinations" 20 March 2015, paragraph [15.10].

225 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, paragraph [290].

226 We assumed a 32kbps best effort CoS as the base service on top of which we have calculated the additional costs of the real time services.

6.[227]

Table 6: Gradient determined in UBA IPP, based on Belgium[228]

Bitstream service	Price (EUR)	Mark-up
32kbps best effort service	4.56	
32kbps best effort service + 40kbps real time service	5.53	21.32%
32kbps best effort service + 90kbps real time service	5.77	26.57%
32kbps best effort service + 180kbps real time service	6.20	36.02%

398. For each year of the regulatory period, we have applied these percentage mark-ups to the monthly unit TSLRIC cost for the UBA increment (as discussed above at paragraph 369), to determine monthly unit prices for each of the four UBA variants. We have also taken account of the distribution of customers across each of the UBA variants, so that the total TSLRIC costs for the UBA increment are spread across the four UBA variants in proportion to this customer distribution.

399. Table 7 below provides the prices for the UBA increment determined based on our TSLRIC model and the gradient determined in UBA IPP determination.

Table 7: Prices for BUBA and EUBA increment (NZ$, nominal prices)

	Year 1	Year 2	Year 3	Year 4	Year 5
BUBA	11.15	10.97	10.80	10.65	10.52
EUBA40	13.53	13.31	13.11	12.92	12.76
EUBA90	14.12	13.89	13.68	13.48	13.31
EUBA180	15.17	14.93	14.70	14.49	14.31

Source: Commission's TSLRIC model for further draft decision

Price profile

400. 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

[227] The Belgian 32kbps base service is calculated assuming a 32kbps best efforts dedicated Ethernet VLAN to the regional handover point. The real time services also include a real time dedicated Ethernet VLAN.

[228] Source: 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, paragraph [292].

for each year over the regulatory period.

Our December 2014 draft decision and views of submitters

401. In our December 2014 UBA 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.[229]

402. We also provided our levelising formula in the December 2014 UBA draft determination paper. We considered that this formula provided for both stable prices and cost recovery.[230] We illustrated in the December 2014 UBA 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.[231]

403. In response to our December 2014 UBA 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.[232] 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.[233]

404. At the conference, Chorus indicated that 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.[234]

Our further draft decision is to set nominal prices for each year over the regulatory period

405. Upon further consideration 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 UBA draft determination paper.

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229 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraphs [365]-[376].

230 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [375].

231 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraphs [365]-[376].

232 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].

233 CallPlus "Submission on the Commerce Commission's Draft determinations for UBA and UCLL services" CONFIDENTIAL, 20 February 2015, paragraph [61].

234 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 283.

406. We note that both approaches, ie, setting a constant levelised 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.

407. We have decided to move away from constant levelised prices because using a price path based on nominal prices for each year over the regulatory 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

408. 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).

Chapter 4: Price adjustments for UBA

Purpose

409. In this Chapter, we set out our consideration of the following:

409.1 Whether the central estimate of the TSLRIC price for the UBA service is likely to best give effect to the section 18 purpose statement, or whether a departure from the central estimate might be justified.[235]

409.2 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 UBA service.

409.3 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.

Our further draft decision

410. Our further draft decision is that the central estimate of the TSLRIC price for the UBA service is likely to best give effect to the section 18 purpose statement. 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 UBA service.

411. 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?

412. As explained in Chapter 1, we take the price for the UCLL service and add to it the TSLRIC of the additional costs incurred in providing the UBA service, and in this further draft pricing review determination we are only pricing the "UBA increment". 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 reasonable options upon which reasonable people may disagree. We have provided further details on our judgement and views on modelling decisions throughout this consultation.

413. As we discuss in the UCLL FPP further draft determination, there may be asymmetric effects from 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

[235] By "central estimate", we mean the unadjusted estimate that is produced by our TSLRIC model.

slower migration to fibre-based services and potential losses arising from less investment in innovative new services.

414. In the case of the UBA increment, an uplift may have two potentially conflicting effects on migration:

414.1 It will determine the price of access to the UBA network relative to alternative networks. Therefore, a higher price will make alternative networks (ie, fibre) relatively more attractive to end-users.

414.2 It will directly affect the incentives for access seekers to unbundle Chorus' copper network and, potentially, thereby reduce migration to alternative networks.

415. We continue to be of the view that any potential concerns around migration are likely to be best addressed by considering whether to depart from the central estimate of the TSLRIC-based UCLL price rather than the TSLRIC-based UBA price. This is because the UCLL service underpins both UCLL-based and UBA-based retail services and will, therefore, have a more direct effect on copper-based services. In addition, an increase in the UBA increment may have an offsetting effect to the extent that it promotes unbundling.

416. The final output of the model represents our best or central estimate of the forward-looking TSLRIC for the UBA 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 UBA 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".

417. Although for the same reasons as given in the UCLL FPP further draft determination we have not attempted to derive a quantitative range of TSLRIC-based UBA prices, we consider that our central estimate of the TSLRIC price sits within a plausible range, and 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 be likely to best give effect to section 18 purpose statement.

418. In Chapter 4 of the UCLL FPP further draft determination, we set out our current view that no adjustment should be made to our central estimate of the TSLRIC-based price for the UCLL service. This is on the basis that the positive network effects from faster migration to fibre are unlikely to outweigh the welfare losses from higher prices for copper-based services. For the same reasons, the benefits of an uplift applied to the UBA increment resulting in faster migration to fibre are unlikely to outweigh the welfare losses from higher copper prices. This conclusion will be reinforced in the case of the UBA increment to the extent that the uplift encourages greater unbundling and potentially reduces migration to alternative networks.[236] Given that an uplift to the UBA increment may have an offsetting migration effect to

[236] Refer to paragraph 414.2 above.

the extent that it promotes unbundling, we have concluded that no adjustment should be made to our central estimate of the TSLRIC-based price for the UBA increment.

Overall conclusion on section 18 considerations

419. For the reasons given above, we consider that our central estimate of the TSLRIC-based price for the UBA service is likely to give best effect to the section 18 purpose statement. We also consider that our mid-point estimate of the WACC is likely to give best effect to the section 18 purpose statement.

Consideration of the relativity requirement in the Act

We must consider the relativity between the UCLL service and the UBA service

420. Section 19(b) requires us to consider any additional matters specified in Schedule 1 regarding the application of section 18. For the UCLL and UBA services, that additional matter is the relativity between the UCLL service and the UBA service.

421. We note that the issue of relativity is particularly important for the UBA service, as relativity will influence the incentives for efficient unbundling decisions. We have set out our views on the relativity requirement in Chapter 4 of the UCLL FPP further draft determination. We consider that the conclusions we have drawn on relativity in the UCLL FPP further draft determination apply equally to the UBA service.

422. 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

Chapter 5: Non-recurring charges

Purpose

423. 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

424. All NRC are included in the scope of this review.

425. Where possible, NRC will be priced on a top-down approach with an efficiency adjustment based on international indexation and national cross checks.

426. Where we cannot apply this approach, NRC will be priced either on an hourly rate or on a price on application (POA) basis.

What are NRC?

427. NRC are charges levied on access seekers to recover time and material costs incurred outside of the UBA monthly recurring charges.

428. 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.

429. NRC are listed in the UBA STD as "Service transaction charges (numbers beginning with 1)" and "Ancillary services (numbers beginning with 3)".[237] Charges are also categorised within the UBA 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.[238]

430. 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.

431. The prices for NRC in the STD are set on the following basis:

    431.1 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.

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237 Commerce Commission "Consultation on setting prices for service transaction charges for UBA and UCLL services" 25 September 2014 paragraph [11].

238 UBA STD Sch. 2 12 Dec 2007 Consolidated 5 November 2013 paragraphs [2.1-2.3].

431.2 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.

431.3 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.[239]

432. NRC form an integral part of the UBA 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

433. NRC were initially consulted on in September 2014.[240] We consulted on the approach to take for determining how to set prices for the transaction charges that were set in the IPP determination.

434. In the UBA IPP determination we benchmarked 10 of the 23 service transaction charges in the UBA STD. None of the ancillary charges listed in the UBA STD were considered.

435. 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

436. 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.

437. 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.

438. 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.[241]

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239 Commerce Commission "Unbundled Bitstream Access Service Standard Terms Determination" Schedule 2, Charges 2.4.

240 Commerce Commission "Consultation on setting prices for service transaction charges for UBA and UCLL services" 25 September 2014.

439. However, all other respondents considered that our view was too narrow an interpretation for it to be correct.

440. 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.[242,243,244,245]

441. 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.[246] 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.[247]

442. 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.[248] Spark stated that the FPP exercise was not a second look at or correction of the way the IPP determination was done.

443. As such, this group of submitters stated that the Commission 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.

444. After consideration of the responses received, we have revisited our preliminary view.

445. We agree with the submissions received from Spark, Vodafone, Wigley and Company and CallPlus that the correct interpretation of section 42(1) of the Act focusses on

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241 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 paragraph [17].

242 Spark "Setting prices for service transaction charges for UBA and UCLL services'" 9 October 2014 paragraph [7].

243 Vodafone "Submission on consultation paper on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014 p. 2.

244 CallPlus "Submission on the Commerce Commission's Consultation paper: setting prices for service transaction charges for UBA and UCLL" 9 October 2014 paragraph [8].

245 Wigley and Company "Submission on consultation on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, paragraph [4.2].

246 Ibid, paragraph [4.2] (e)

247 Vodafone "Submission on consultation paper on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014, p. 2.

248 Spark "Setting prices for service transaction charges for UBA and UCLL services'" 9 October 2014 paragraph [6].

the "designated access service", which includes all of the charges, recurring and non-recurring that are related to it.

446. The definition of "service" does not distinguish between services that are once-off or recurring, but rather it is all encompassing.[249] 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.

447. 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.[250]

448. 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.[251] Sundry charges were excluded from the IPP assessment, as benchmarking them was not possible, however when 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.[252]

449. In our view 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.

450. In summary, we are now updating our view and have reviewed all of the NRC listed in the UBA 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 objectives, by imposing a full set of charges that have

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249 The definition of services as per subpart 1 of part 2 of Schedule 1 of the Act.

250 The full discussion of the TSLRIC framework and of section 18 is in Chapter 1 of this document.

251 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 paragraph [16].

252 Vodafone "Submission on consultation paper on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014 p. 2.

been assessed for efficiency, ensures that competition is promoted for the long-term benefit of end-users.

Modelling options – September 2014 approach

451. 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:[253]

451.1 Top-down - use Chorus' service company charges and overhead costs as inputs;

451.2 Bottom-up - model the time and materials of the relevant activities and overhead costs; or

451.3 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 calculate the costs of providing the transactions.

452. 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.

453. Chorus and CEG submitted that the regulatory history has meant that Chorus (and Telecom prior) has been incentivised to minimise costs, by keeping the difference between the regulated prices and cost as profit.[254,255] 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.[256]

454. Chorus submitted that if we use cross checks, then it is important that these reflect real world NZ activities.[257]

455. WIK submitted that one way of producing an efficiency factor in a CPI-X calculation would be international benchmarking.[258]

456. 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.[259]

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253 Commerce Commission "Consultation on setting prices for service transaction charges for UBA and UCLL services" 25 September 2014 paragraphs [31] and [33.1-33.3].

254 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, paragraph [35].

255 CEG "Memorandum – WIK transaction charges" 16 October 2014, paragraph [13]

256 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 paragraph [7].

257 Ibid, paragraph [10].

258 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 paragraph [16].

457. WIK and Wigley and Company submitted that our TSLRIC approach uses a hypothetical efficient operator, and therefore our approach to NRC cannot be based solely on Chorus costs. We should carry out bottom-up modelling or an efficiency adjustment.[260,261]

Approach

458. In order to address some of the issues raised in the submissions, and ultimately determine which approach was appropriate, it was important for us to understand the availability of data, before we determined how we could undertake this task.

459. Accordingly, we requested information from Chorus, Enable and North Power, and access seekers (Spark, Vodafone and CallPlus).

460. 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 map to more than one NRC.[262]

461. 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.

462. We found that because of Chorus' position in the market as the predominant wholesale bitstream provider, it was challenging to find comparable NRC activity being performed by any other NZ-based operators.[263]

463. 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 Chorus (copper) and [ ] **CI** (fibre). Understandably, comparing activities across different network platforms has required a degree of judgement.

464. 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.

465. Having assessed submissions and the availability of relevant data, we have reached the following views on modelling approaches for UBA NRCs.

466. A bottom-up model requires a detailed work breakdown structure of each NRC, considering all tasks performed by the individuals performing the work.

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259 Ibid, paragraphs [7] (f) and [20].

260 Ibid, paragraph [27].

261 Wigley and Company "Submission on consultation on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014 paragraph [6.3].

262 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.

263 Vodafone was asked to provide similar information but did not do so.

467. 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. [264,265]

468. 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.[266]

469. 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.

470. Additionally, we consider it is appropriate to model NRC based on an underlying copper access network basis as opposed to a fibre access network. This reflects the reality that not all copper-based tasks have an equivalent in the fibre world.

471. An important implication of our proposed modelling approach is the acceptance that our hypothetical efficient operator would outsource its network provisioning and fault operations.[267] WIK has previously challenged whether employing service companies for this purpose was the efficient starting premise for NRC modelled costs.[268] 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. Examples of these include contracts for network construction and network maintenance in Australia.[269,270]

472. 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.

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264 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 paragraph [27].

265 Wigley and Company "Submission on consultation on setting prices for service transaction charges for UBA and UCLL services" 9 October 2014 paragraph [6.2].

266 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 paragraph [36].

267 As Chorus uses outsourced field services we assume the hypothetical efficient operator will do the same.

268 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].

269 Transfield Services PTY Ltd "Transfield Services awarded key five-year agreement with NBN Co" (press release 10 June 2015).

270 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).

Implementation

473. Accordingly, we asked TERA to focus its attention on how we might implement a top-down with efficiency adjustment approach.

High level modelling implementation

474. Based on TERA's recommendations, we undertook the following modelling approach:

474.1 Take Chorus' service company costs as the starting point.

474.2 Undertake an efficiency adjustment by adopting the lowest observed task time from other jurisdictions, where these are lower than Chorus' time.

474.3 For those sundry service components that are charged on a per hour, 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.

474.4 Adding in Chorus' service company overhead, plus a TERA-derived Chorus overhead, calculate a revised cost-based NRC price.

474.5 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

475. 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

476. 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.

477. 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.

478. However, it must be noted that it is not always straightforward to make cross-country comparisons.[271]

479. 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

480. 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.

481. 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.

482. 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.

483. 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.

484. 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.

485. This approach is more top-down in nature, as it relies upon the competitive tender process to produce efficient rates.[272] 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).

Service company overheads

486. 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 considers the overall cost when selecting the most efficient service company. As a consequence, comparing it against other

[271] TERA has been as transparent as possible in its NRC report on its inputs and assumptions to enable the industry to review it.

[272] Noting there is an additional LFC cross-check that follows this step.

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

487. 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

488. 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.

489. 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**.

490. This will act as a price cap for the prices that are produced through either our international indexation or New Zealand hourly rate modelling.

491. We have used [ ] **CI** for our LFC comparison. Its network is being built to pass approximately [ ] **CI** premises in [ ] **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.

492. The "rebuilding" exercise, which is set out in detail in TERA's NRC report,[273] 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.

493. 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 piece of fibre optic customer premises equipment (CPE), which is similar to installing the equivalent copper CPE. 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.

[273] 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".

494. 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

495. 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.[274]

496. We have found that volumes for different NRC vary significantly. The NRC for UBA are characterised by a small set of high volume service components, predominately relating to new connection activity and transfers of end-users, 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 UBA. For instance, there are only [ ] **CNZCI** NRC which account for 65% of total NRC revenue and 23% of NRC transaction volume. There are [ ] **CNZCI** NRC for which there is no transaction volume.[275] In addition to this, there [ ] **CNZCI** NRC, [ ] **CNZCI**, which accounts for 4% of total NRC revenue and 66% of transaction volume.

497. The three changes that we consider to be material in terms of volume and price change are:

497.1 1.1 New connection – site visit required;

497.2 1.31 Transfer of Basic UBA Service from an Access Seeker to a Basic UBA Service with another Access Seeker (no DSLAM port change); and

497.3 3.3 No fault found.

Price terms

498. As noted in our draft decisions, some NRC will be priced on an hourly rate or POA basis.

POA

499. POA is a charging approach that has been a feature of the UBA 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.[276]

500. 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.

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274 Based on 2014 data.

275 Chorus data December 2013 to November 2014.

276 For more detail, refer section 2 of Schedule 2 of UBA STD.

501. 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.

502. 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

503. 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.

504. In such cases an hourly rate is an appropriate pricing mechanism.

Operational support system cost recovery

505. 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, log and track faults.

506. Accordingly, there were a number of NRC that were established in 2007 to provide for recovery of the access provider's OSS.

507. We have worked with TERA to identify whether the opex model developed for recurring charges already provides for the cost recovery of these assets.[277] 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.

508. 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 UBA NRC

509. 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.

510. Summary tables for each set of charges are provided at the end of this Chapter.

[277] An allocation of opex cost will be made to NRCs.

Core UBA NRC

New connection - no site visit required (remote connection) (Service Component 1.1)

511. Current price: $15.85.

512. 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.

513. Draft price: $5.82.

New connection - exchange or cabinet visit required (Service Component 1.1)

514. Current price: $73.51.

515. 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.

516. Draft price: $45.00.

New connection - site visit required (Service Component 1.1)

517. Current price: $169.73.

518. 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.

519. Draft price: $122.16.

Other broadband service to any UBA service change plan (no DSLAM port change) (Service Component 1.9)

520. Current price: $15.85.

521. 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.

522. Intended to help facilitate the migration from UBS to UBA. No longer relevant for this purpose. Section 30R review to determine its relevance going forward.

523. Draft price: $5.82.

Other broadband service to any UBA service change plan (DSLAM port change) (Service Component 1.9)

524. Current price: $73.51.

525. 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.

526. Intended to help facilitate the migration from UBS to UBA. No longer relevant for this purpose. Section 30R review to determine its relevance going forward.

527. Draft price: $45.00.

Any UBA service to any other UBA service change plan (no DSLAM port change) (Service Component 1.10)

528. Current price: $15.85.

529. 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.

530. Expect this activity volume captures end-users moving from clothed to naked UBA variant. If so, likely to see a continuation of high volume for this activity.

531. Draft price: $5.82.

Any UBA service to any other UBA service change plan (DSLAM port change' (Service Component 1.10)

532. Current price: $73.51.

533. 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.

534. Cannot envisage a scenario where an end-user plan change would trigger a DSLAM port change.

535. Draft price: $45.00.

Transfer of Basic UBA Service from an Access Seeker to a Basic UBA Service with another Access Seeker (DSLAM port change)' (Service Component 1.31)

536. Current price: $73.51.

537. 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.

538. Draft price: $45.00.

Transfer of Basic UBA Service from an Access Seeker to a Basic UBA Service with another Access Seeker (no DSLAM port change) (Service Component 1.31)

539. Current price: $15.85.

540. 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.

541. Draft price: $5.82.

Transfer of Basic UBA Service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (DSLAM port change) (Service Component 1.32)

542. Current price: $73.51.

543. 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.

544. Low/non-existent demand for EUBA - hence zero volume.

545. Draft price: $45.00.

Transfer of Basic UBA Service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (no DSLAM port change) (Service Component 1.32)

546. Current price: $15.85.

547. 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.

548. Draft price: $5.82.

Transfer of EUBA Service from an Access Seeker to a BUBA Service with another Access Seeker (DSLAM port change) (Service Component 1.33)

549. Current price: $73.51.

550. 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.

551. Low/non-existent demand for EUBA - hence zero volume.

552. Draft price: $45.00.

Transfer of EUBA Service from an Access Seeker to a BUBA Service with another Access Seeker (no DSLAM port change) (Service Component 1.33)

553. Current price: $15.85.

554. 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.

555. Low/non-existent demand for EUBA - hence zero volume.

556. Draft price: $5.82.

Transfer of EUBA Service from an Access Seeker to an EUBA Service with another Access Seeker (DSLAM port change) (Service Component 1.34)

557. Current price: $73.51.

558. 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.

559. Draft price: 442.17.

Transfer of EUBA Service from an Access Seeker to an EUBA Service with another Access Seeker (no DSLAM port change) (Service Component 1.34)

560. Current price: $15.85.

561. 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.

562. Draft price: $5.82.

Transfer of other broadband service from an Access Seeker to a Basic UBA Service with another Access Seeker (DSLAM port change) (Service Component 1.35)

563. Current price: $73.51.

564. 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.

565. Intended to help facilitate the migration from UBS to UBA. No longer relevant for this purpose. Section 30R review to determine its relevance going forward.

566. Draft price: $45.00.

Transfer of other broadband service from an Access Seeker to a Basic UBA Service with another Access Seeker (no DSLAM port change) (Service Component 1.35)

567. Current price: $15.85.

568. 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.

569. Intended to help facilitate the migration from UBS to UBA. No longer relevant for this purpose. Section 30R review to determine its relevance going forward.

570. Draft price: $5.82.

Transfer of other broadband service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (DSLAM port change) (Service Component 1.36)

571. Current price: $73.51.

572. 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.

573. Intended to help facilitate the migration from UBS to UBA. No longer relevant for this purpose. Section 30R review to determine its relevance going forward.

574. Draft price: $45.00.

Transfer of other broadband service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (no DSLAM port change) (Service Component 1.36)

575. Current price: $15.85.

576. 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.

577. Intended to help facilitate the migration from UBS to UBA. No longer relevant for this purpose. Section 30R review to determine its relevance going forward.

578. Draft price: $5.82.

UBA service relinquishment (Service Component 1.39)

579. Current price: No charge.

580. Our reasoning supporting the current STD charge stated:

> The UBA service relinquishment charge is currently applied in accordance with subclause 4A.2 of Schedule 2 to the UBA STD. There is no charge for a new connection where an end-user signs up to a term contract associated with a free connection. The UBA service relinquishment charge only applied where an end-user terminated their UBA service contract within the term associated with the free connection. Given clause 4A has been removed from the Schedule and a charge applies in all instances of a new connection, we consider it appropriate that no charge applies for a relinquishment of the UBA service.[278]

581. We maintain our original reasoning, as set out above, that this charge was originally in place to recover early termination costs where the connection was free. This construct no longer exists. As all connection costs are now recovered upfront by Chorus, no cost recovery is required.

582. Draft price: No charge.

UBA Service Move Address – no site visit required (remote connection) (Service Component 1.40)

583. Current price: $15.85.

584. As per UBA *New connection - no site visit required (remote connection) (Service Component 1.1)*

585. Draft price: $5.82.

UBA Service Move Address – exchange or cabinet visit required (Service Component 1.40)

586. Current price: $73.51.

587. As per UBA *New connection - exchange or cabinet visit required (Service Component 1.1).*

588. Draft price: $45.00.

UBA Service Move Address – site visit required (Service Component 1.40)

589. Current price: $169.73.

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278 Commerce Commission "Unbundled Bitstream Access Service Price Review – Decision (2013) NZCC 20" 5 November 2013, paragraph [327-328].

590. As per UBA *New connection - site visit required (Service Component 1.1).*

591. Draft price: $122.16.

Data interleaving toggle (Service Component 1.41)

592. Current price: $15.85.

593. 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.

594. Draft price: $5.82.

Sundry UBA NRC

Exception to BAU order (Service Component 1.37)

595. Current price: POA.

596. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

597. Draft price: POA.

Multiple order for single end-user support (Service Component 1.38)

598. Current price: No charge.

599. Our reasoning supporting the current STD charge stated:

> The Commission notes where the Access Seeker places orders for 10 or more connections or transfers for a single end-user, Telecom could reasonably be expected to achieve economies of scale for these activities, but Telecom does not have a retail price for multiple orders for a single end-user. The Commission considers that as there are no retail prices for bulk broadband connections or transfers, there should be no wholesale charge for the UBA services. There are also no retail prices for project management and additional transaction resources required for bulk broadband connections and transfers. Accordingly, the Commission considers that there should be no charge for project management and additional transaction resources.[279]

600. Our reasoning in Decision 611 was based on a retail-minus pricing regime. Under TSLRIC principles there are clearly costs associated with this activity and therefore a cost recovery is justified.

601. UCLL 1.6 (bulk line transfer for a single end-user), which is recovered through POA charge, is comparable to this UBA activity.

602. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

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[279] Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraphs [300-301].

603. Draft price: POA.

Access Seeker handover connection installation - GigE capacity Basic UBA service only (Service Component 1.42)

604. Current price: $551.08.

605. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" which is set out at 2.3.1 in the TERA NRC report.

606. Draft price: $487.59.

Access Seeker handover connection installation - GigE capacity Enhanced UBA service only (Service Component 1.43)

607. Current price: $551.08.

608. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" which is set out at 2.3.1 in the TERA NRC report.

609. Draft price: $487.59.

Access Seeker handover connection installation - STM1 capacity (Service Component 1.44)

610. Current price: $551.08.

611. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" which is set out at 2.3.1 in the TERA NRC report.

612. Draft price: $487.59.

Access Seeker handover connection installation - STM4 capacity (Service Component 1.45)

613. Current price: $551.08.

614. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" which is set out at 2.3.1 in the TERA NRC report.

615. Draft price: $487.59.

Relinquishment of Access Seeker handover connection (Service Component 1.46)

616. Current price: POA.

617. Our reasoning supporting the current STD charge stated:

> Telecom argues that they may incur costs for relinquishment, as relinquishment may require Telecom to physically disconnect the Handover Connection and handover fibre from the OFDF. Telecom also recognises that they may not need to disconnect standard terms determination for Telecom's unbundled bitstream access service the Handover Connection or the Handover Fibre, and in this case they would not charge for relinquishment. The

> Commission is satisfied that there should be no charge if disconnection of a Handover Connection is not required, and should be POA where disconnection is required.[280]

618. We maintain our original reasoning.

619. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

620. Draft price: POA.

Handover fibre installation (Service Component 1.47)

621. Current price: POA.

622. Our reasoning supporting the current STD charge stated:

> Telecom argues that the activity required to install Handover Fibre is different from that of a Handover Connection, and will vary materially from exchange to exchange. Telecom submit that on this basis, the Handover Fibre Installation should be POA. The costs for this service must as closely as practicable reflect those costs incurred by Telecom for installing the Handover Connection. The Commission has determined that cost-based POA is appropriate for the pricing of this service.[281]

623. Agree with original reasoning.

624. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

625. Draft price: POA.

Re-mapping design charge (Service Component 1.48)

626. Current price: $1,989.29.

627. Our reasoning supporting the current STD charge stated:

> In the draft STD, the Commission requested Telecom supply further information to support the fixed fee design and per end-user charges. Telecom responded that these tasks are parameter updates, network re-configuration and project management. Telecom submits that the costs of these tasks for a Remapping Design, plus a common cost mark up, results in a charge of $1,770. The Commission believes that it is necessary to determine a re-mapping charge for the purposes of this UBA STD. Accordingly, it has adopted the Re-mapping Design charge of $1,770, and the Access Re-Mapping Fee of $1.05 per end-user that requires re-mapping.[282]

628. In reaching this view, we relied upon statements made by Telecom in its Standard Terms Proposal, which stated:

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280 Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraphs [304-306].

281 Ibid, paragraphs [307-309].

282 Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraphs [310-312].

> Where an Access Seeker requests changes to the mapping of the UBA Service, charges will apply for re-mapping design and a per End User access re-mapping fee. These charges reflect the underlying time and costs incurred in network rebuild designing, system changes and implementation.[283]

629. The bespoke nature of re-mapping, as described by Telecom, lends itself to a POA charge, not a fixed fee.

630. Draft price: POA.

Access re-mapping fee (service component 1.49)

631. Current price: $1.19 per end -user.

632. Re-mapping work is directly related to number of end-users. Charge reflects Chorus' estimated cost to re-map an end-user. No equivalent service identified elsewhere.

633. Volumes for these charges vary significantly as a function of RSPs making rearrangements in their own networks. In October 2014 Chorus executed 19,952 orders of this type.

634. In the absence of other cost data this price should remain at current level.

635. Draft price: $1.19 per end-user.

Additional charge for wiring (Service Component 1.50)

636. Current price: POA.

637. We do not have data identifying the proportions of connection only compared with connection and wiring. Therefore, we do not have reliable wiring volumes. If wiring volume is high.

638. TERA has noted that in Ireland a labour plus materials pricing approach is used, however it recommend that POA is appropriate as set out in Table 17 – "POA service components" in the TERA NRC report.

639. We agree with TERA's conclusion.

640. This is a bespoke activity with unknown volumes and a range of complexity. Therefore POA pricing is appropriate.

641. Draft price: POA.

Modem installation (Service Component 1.50)

642. Current price: $38.01.

643. Modem installation transaction volume is low.

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[283] Telecom "Standard Terms Proposal for Telecom's Unbundled Bitstream Access Service – UBA Submission – Public Version" 11 July 2007, paragraph [178].

644. There is an absence of comparable international data.

645. In the absence of data and considering the low volume, retaining the current price is appropriate.

646. Draft price: $38.01.

Automatic address pre-qualification order (Service Component 3.1)

647. Current price: No charge.

648. Our reasoning supporting the current STD charge 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.[284]

649. We maintain our original reasoning.

650. The information stored in the database is information that Chorus needs to hold and maintain – the only recoverable cost (if any) is making the database "wholesale-ready."

651. 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.

652. Draft price: No charge.

Special manual pre-qualification investigation order (Service Component 3.2)

653. Current price: $118.78 per hour.

654. A variable hourly charge appears appropriate for this low volume activity.

655. Draft price: $54.59 per hour.

No fault found (Service Component 3.3)

656. Current price: $112.63.

657. Our reasoning supporting the current STD charge stated:

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[284] Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraphs [322-324].

> 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.[285]

658. TERA has modelled the costs for this activity.

659. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" with specific reference to code 299 which is set out at 2.3.1.3 in the TERA NRC report.

660. Draft price: $76.30.

Abortive end-user site visit (Service Component 3.4)

661. Current price: $99.66.

662. 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.

663. Draft price: $16.53.

Cancellation of exception to BAU support order (Service Component 3.5)

664. Current price: POA.

665. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

666. Draft price: POA.

Additional OO&T training (Service Component 3.6)

667. Current price: $112.32 plus actual travel costs.

668. An hourly labour rate plus travel expenses is appropriate for this charge.

669. Draft price: $54.59 plus actual travel costs.

Additional OFM training (Service Component 3.7)

670. Current price: $112.32 plus actual travel costs.

671. An hourly labour rate plus travel expenses is appropriate for this charge.

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[285] Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraphs [325-328].

672. Draft price: $54.59 plus actual travel costs.

OO&T licence fee (Service Component 3.8)

673. Current price: $24.00 per access seeker per month.

674. 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.

675. Draft price: No charge.

OFM licence fee (Service Component 3.9)

676. Current price: $24.00 per access seeker per month.

677. 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.

678. Draft price: No charge.

Additional copies of invoice (Service Component 3.10)

679. Current price: $112.32.

680. Current charge is set equal to one hour's labour. This appears to be due to a level of manual interaction with billing systems.

681. 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.

682. Draft price: No charge.

Additional billing information (Service Component 3.11)

683. Current price: POA.

684. TERA has 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.

685. We request submissions on this matter.

Draft price: POA.Handover fibre maintenance charge (Service Component 3.12)

686. Current price: No charge.

687. Our reasoning supporting the current STD charge stated:

> The Commission understands that handover fibres are unlikely to require a significant amount of ongoing maintenance, and therefore does not consider that there should be a charge for maintenance of the handover fibre.[286]

688. We maintain our original reasoning.

689. Draft price: No charge.

Cancellation charge (pre truck roll) (Service Component 3.13)

690. Current price: $4.94.

691. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" with specific reference to Cancellation charge (Pre truck roll)/ Abortive which is set out at 2.3.2.6 in the TERA NRC report.

692. Draft price: $5.82.

Cancellation charge (post truck roll) (Service Component 3.14)

693. Current price: $99.66.

694. We agree with TERA's modelling of "Non-recurring activities mapped to a service code" with specific reference to Cancellation charge (Post truck roll)/ Abortive end-user visit which is set out at 2.3.2.7 in the TERA NRC report.

695. Draft price: $16.53.

Fixing fault which Access Seeker no right of access (Service Component 3.15)

696. Current price: POA.

697. This is a bespoke, irregular and complex activity, therefore POA pricing is appropriate.

698. Draft price: POA.

Additions to the approved modem list (Service Component 3.16)

699. Current price: $1,500.00.

700. Our reasoning supporting the current STD charge stated:

> …Access Seekers can apply to have new modems tested and approved for installation by Telecom (Chorus). The Commission considers that basing this new charge on the current Telecom (Chorus) charge, which covers field force testing, training and implementation, is reasonable and reflects the costs of providing this Service Component.[287]

701. We maintain our original reasoning.

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[286] Commerce Commission "*Standard Terms Determination for the designated service Telecom's unbundled bitstream access Decision 611"* 12 December 2007, paragraph [320].

[287] UBA STD Sch. 4 Operations manual, 30 November 2011, paragraph 16.3.

702. This activity, although low volume, appears to be transparent, contained, and repeatable.

703. Draft price: $1,500.00

Summary table of charges

UBA core charges

Transaction name	Service component	Transaction volume All volumes CNZCI	Current price	Draft price
New connection - no site visit required (remote connection)	1.1	[	$15.85	$5.82
New connection - exchange or cabinet visit required	1.1		$73.51	$45.00
New connection - site visit required	1.1		$169.73	$122.16
Other broadband service to any UBA service change plan (no DSLAM port change)	1.9		$15.85	$5.82
Other broadband service to any UBA service change plan (DSLAM port change)	1.9		$73.51	$45.00
Any UBA service to any other UBA service change plan (no DSLAM port change)	1.10		$15.85	$5.82
Any UBA service to any other UBA service change plan (DSLAM port change)	1.10		$73.51	$45.00
Transfer of Basic UBA Service from an Access Seeker to a Basic UBA Service with another Access Seeker (DSLAM port change)	1.31	]	$73.51	$45.00

Transfer of Basic UBA Service from an Access Seeker to a Basic UBA Service with another Access Seeker (no DSLAM port change)	1.31	[	$15.85	$5.82
Transfer of Basic UBA Service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (DSLAM port change)	1.32		$73.51	$45.00
Transfer of Basic UBA Service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (no DSLAM port change)	1.32		$15.85	$5.82
Transfer of EUBA Service from an Access Seeker to a BUBA Service with another Access Seeker (DSLAM port change)	1.33		$73.51	$45.00
Transfer of EUBA Service from an Access Seeker to a BUBA Service with another Access Seeker (no DSLAM port change)	1.33		$15.85	$5.82
Transfer of EUBA Service from an Access Seeker to an EUBA Service with another Access Seeker (DSLAM port change)	1.34		$73.51	$45.00
Transfer of EUBA Service from an Access Seeker to an EUBA Service with another Access Seeker (no DSLAM port change)	1.34		$15.85	$5.82
Transfer of other broadband service from an Access Seeker to a Basic UBA Service with another Access Seeker (DSLAM port change)	1.35	]	$73.51	$45.00

Transfer of other broadband service from an Access Seeker to a Basic UBA Service with another Access Seeker (no DSLAM port change)	1.35	[	$15.85	$5.82
Transfer of other broadband service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (DSLAM port change)	1.36		$73.51	$45.00
Transfer of other broadband service from an Access Seeker to an Enhanced UBA Service with another Access Seeker (no DSLAM port change)	1.36		$15.85	$5.82
UBA service relinquishment	1.39		$0.00	$0.00
UBA service move address - remote connection without port	1.40		$15.85	$5.82
UBA service move address - exchange or cabinet jumper only	1.40		$73.51	$45.00
UBA service move address - site visit required	1.40		$169.73	$122.16
Data interleaving toggle	1.41		$15.85	$5.82
Additional charge for wiring	1.50	]	POA	POA

UBA sundry charges

Transaction name	Service component	Transaction volume All volumes CNZCI	Current price	Draft price
Exception to BAU order	1.37	[	POA	POA
Multiple order for single end-user support	1.38		$0.00	POA
Access Seeker handover connection installation - GigE capacity Basic UBA service only	1.42		$551.08	$487.59
Access Seeker handover connection installation - GigE capacity Enhanced UBA service only	1.43		$551.08	$487.59
Access Seeker handover connection installation - STM1 capacity	1.44		$551.08	$487.59
Access Seeker handover connection installation - STM4 capacity	1.45		$551.08	$487.59
Relinquishment of access seeker handover connection	1.46		POA	POA
Handover fibre installation	1.47		POA	POA
Re-mapping design charge	1.48		$1,989.29	POA
Access re-mapping fee	1.49		$1.19	$1.19
Modem installation	1.50		$38.01	$38.01
Automatic address pre-qualification order	3.1		$0.00	$0.00
Special manual pre-qualification investigation order	3.2		$118.78	$54.59
No fault found	3.3	]	$112.63	$76.30

Abortive end-user site visit	3.4	[	$99.66	$16.53
Cancellation of exception to BAU support order	3.5		POA	POA
Additional OO&T training	3.6		$112.32	$54.59
Additional OFM training	3.7		$112.32	$54.59
OO&T licence fee	3.8		$24.00	$0.00
OFM licence fee	3.9		$24.00	$0.00
Additional copies of invoice	3.10		$112.32	$0.00
Additional billing information	3.11		POA	POA
Handover fibre maintenance charge	3.12		$0.00	$0.00
Cancellation charge (pre truck roll)	3.13		$4.94	$5.82
Cancellation charge (post truck roll)	3.14		$99.66	$16.53
Fixing fault which access seeker no right of access	3.15		POA	POA
Additions to the approved modem list	3.16		$1,500.00	$1,500.00
New connection - no site visit required (remote connection)	1.1	]	$15.85	$5.82

Monthly Space Rental Charge and handover connections

704. Different to NRC, but also modelled separately are the prices we have set for a unique recurring charge, that are not captured elsewhere.

Handover fibre space rental charge

705. The UBA STD includes a monthly space rental charge for fibre to connect access seeker equipment with Chorus at the handover point of the UBA service. 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 handover location.

706. 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.

707. Accordingly, we have set the following price for the handover fibre space rental service:

	Year 1	Year 2	Year 3	Year 4	Year 5
2.13 Handover fibre space rental charge	$13.42	$12.75	$12.11	$11.51	$10.93

Handover connection

708. The UBA STD includes four charges for access seeker handover connections:

708.1 Service component 2.9, GigE capacity for Basic UBA service only;

708.2 Service component 2.10, GigE capacity for Enhanced UBA services only;

708.3 Service component 2.11, STM1 capacity; and

708.4 Service component 2.12, STM4 capacity.

709. Currently the prices for service components 2.9, 2.11 and 2.12 are based on legacy ATM-based handover connections. However, because the UBA network we have modelled is based on an Ethernet aggregation network we have set prices for these services based on the cost of providing an Ethernet handover connection. We consider this approach to be consistent with setting efficient investment incentives. Accordingly, we have set the following prices for the four handover connections:

	Year 1	Year 2	Year 3	Year 4	Year 5
GigE capacity for Basic UBA service only	93.30	91.29	89.41	86.99	83.09
GigE capacity for Enhanced UBA services only	93.30	91.29	89.41	86.99	83.09
STM1 capacity	93.30	91.29	89.41	86.99	83.09
STM4 capacity	93.30	91.29	89.41	86.99	83.09

Chapter 6: Backdating

Purpose and further draft decision

710. In this Chapter we set out the Commission's further draft decision regarding whether to commence the UBA FPP regulatory period after the Commission's final determination, or at an earlier date (ie, to backdate).

711. The Commission's further draft decision is that the regulatory period should start in December 2015, after the final determination.

712. 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.

Analysis

713. For the reasons set out in Chapter 6 of our UCLL further draft determination (published alongside this UBA further draft determination), we consider that:

    713.1 we have a discretion to set an earlier start date for the UBA FPP regulatory period; and

    713.2 section 18 of the Act guides the exercise of that discretion.

714. In Chapter 6 of the UCLL further draft determination we have set out in some detail our analysis of the various factors which inform our section 18 assessment, including our consideration of submissions. We have also set out the reasoning underpinning the different conclusions on backdating reached by Commissioners as set out in the further draft decision.

715. In a large part, that analysis applies equally in the UBA context. Specifically, in terms of the reasoning of Commissioners Gale and Welson that underlies the Commission's UCLL further draft decision, the same core conclusions apply to UBA:

    715.1 While backdating via claw-back reverses past "errors" by increasing or decreasing future prices above or below the central TSLRIC estimate, the previous distortion cannot be undone, and any forward looking increase or decrease would only introduce a different distortion.

    715.2 It is not clear that backdating, in the current case, will have any material effect on investment. 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.

716. Commissioners Gale and Welson therefore consider that it is not likely that backdating will promote competition for the long-term benefit of end-users.

717. Commissioner Duignan considers that, additional to considerations relevant to UCLL, backdating of the UBA TSLRIC price would help restore the confidence of investors

concerned by the precedent of prices being set under the IPP by benchmarking only two countries.

718. Submitters should treat Chapter 6 of the UCLL further draft determination as applying to UBA except insofar as we have identified particular aspects as being applicable only to UCLL or UBA (as the case may be). To this end we specifically note the following which is relevant to UBA:

718.1 The difference between the UBA IPP and FPP prices ($10.92 compared to $11.45), is much less significant than for UCLL so the implications of backdating will be less pronounced.

718.2 If we were to backdate via claw-back we would need to be satisfied that the mandatory relativity requirements in the Act, which are particularly important for the UBA service, had been met. Any decision to backdate via claw-back would have different impacts on the UCLL and UBA prices.[288]

719. In terms of implementation, the considerations set out in Chapter 6 of the UCLL further draft determination are also largely the same: for convenience we have included figures relevant to UBA in the UCLL further draft determination.

720. While we have essentially applied the same reasoning to UCLL and UBA, we would welcome any UBA specific views on our further draft determination not to backdate.

[288] Our consideration of relativity in Chapter 4 does not take account of any backdating.

Attachment A: UBA network footprint and demand

Purpose

721. This Attachment sets out our earlier views, submissions, analysis and our further draft decisions relating to the network footprint and demand for UBA.

    721.1 The network footprint determines the number of connections that comprise the UBA network, and informs where the modelled network will be deployed; and

    721.2 The network demand determines the number of connections over which total modelled costs will be spread.[289]

Our further draft decisions

722. Our further draft decisions are that:

    722.1 the hypothetical efficient operator network connects every address with an active UBA connection;

    722.2 the hypothetical efficient operator serves demand for all active UBA connections;

    722.3 there is no demand growth or migration of hypothetical efficient operator connections; and

    722.4 the hypothetical efficient operator network serves all demand from Day 1.

The hypothetical efficient operator network connects every address with an active UBA connection.

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

Our earlier views

724. In our December 2014 UBA draft determination paper we limited our consideration of the hypothetical efficient operator to Chorus' copper network, as we considered that this was the underlying network presupposed by the service description in the Act. Accordingly, our view was that the modelled UBA footprint should match Chorus' UBA footprint.[290]

[289] Throughput requirement, which is the average minimum bandwidth each UBA end-user demands during busy hour, is an independent modelling parameter addressed in Attachment B.

[290] Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [420-421].

Submissions

725. We received various submissions on the legality of our position, which are addressed in Attachment B. We received little comment on whether or not our proposed network footprint was an appropriate scale for the provision of the UBA service. However, Wigley and Company did register its support for basing the UBA footprint on Chorus' actuals.[291]

Analysis

726. Notwithstanding our revised views on the scope of our discretion of the UBA MEA selection, our view continues to be that the UBA network footprint should connect every address point with an active UBA connection. This was the footprint modelled for the December 2014 UBA draft determination paper.

727. Modelling a UBA network footprint that connects all active bitstream fixed lines (cable, fibre, FWA etc), or alternatively, connects all address points (as per our modelled UCLL network footprint) sets an inappropriate scale for the hypothetical efficient operator, which (all else held constant) would increase the cost of UBA and incentivise inefficient entry, by way of unbundling.

728. As stated above, our objective is to model an appropriate network scale that (in conjunction with demand) results in an average unit cost that meets our TSLRIC objectives and Section 18 purpose. Accordingly, our view is that an appropriate scale operator's UBA network footprint should connect only active UBA connections. Accordingly, the hypothetical efficient operator network footprint connects every address with an active UBA connection.

The hypothetical efficient operator serves demand for all active UBA connections

729. Our objective, in setting the hypothetical efficient operator's demand (and corresponding network footprint), is to establish an appropriate scale operator for the provision of the UBA 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 view

730. In our December 2014 UBA draft determination paper our view was that modelled UBA demand should match Chorus' actual demand for UBA.[292]

Submissions

731. Similar to our discussion of the UBA network footprint, we received little comment on whether or not our proposed network footprint was an appropriate scale for the

[291] Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraphs [3.1].

[292] Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraphs [420-421].

provision of the UBA service. However, Wigley and Company did register its support for basing the UBA footprint on Chorus' actuals.[293]

Analysis

732. As we have stated previously, we remain of the view that an appropriate scale operator would serve all active UBA connections because this will be more likely to achieve a position of competitive neutrality, where unbundling will occur if it is efficient to do so.[294]

There is no demand growth or migration of hypothetical efficient operator connections.

733. There are a number of factors that determine the demand for regulated UBA such as population growth, migration to Chorus' UFB network, migration to LFC networks, and fixed to mobile substitution. Similarly, these factors impact the demand for regulated UCLL.

734. Please refer to the Attachment A of the July 2015 UCLL further draft determination paper for our reasons and a detailed analysis of the issues around our constant demand assumption.

The hypothetical efficient operator network serves all demand from Day 1

735. 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 UBA connections, 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".[295]

Our earlier views

736. In our December 2014 UBA 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.[296]

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293 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraphs [3.1].

294 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [423].

295 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 Chorus' active UBA connections.

296 Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [509].

Submissions

737. In response, WIK, for Spark and Vodafone, stated 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. [297,298,299]

Analysis

738. As we did not receive any submissions recommending an alternate approach to our December 2014 UBA draft determination paper position, we have focussed on the implementation of our fully-loaded assumption.

739. Our UBA demand is equal to our UBA network footprint connections.

740. Unlike a UCLL access network, which although "fully-loaded" will always have more network connections than demand, the UBA network can be more flexible and better match connections and demand. The reason for this is that bitstream infrastructure (DSLAM line cards) can be easily swapped out and redeployed where demand exists. This is not the case for access networks (ducts and poles) that are sunk investments.

741. We consider that the rearrangement of line cards is an efficient activity our hypothetical efficient operator would undertake in delivering the UBA service. Therefore, our assumption is that this enables our UBA hypothetical efficient operator to match demand to network connections. Accordingly, our hypothetical efficient operator UBA network is fully-loaded.

742. 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.

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297 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].

298 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].

299 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [3.1].

Attachment B: MEA for UBA

Purpose

743. This Attachment sets out our considerations, and responds to submissions from interested parties, on our selection of the MEA for the UBA service.

Our further draft decisions

744. The MEA for the UBA service is relevant only for determining the TSLRIC of the "additional costs" of the UBA service – the price for the UCLL component is set in accordance with the UCLL pricing principle.

745. While the MEA for UBA is dependent on the underlying access network that the hypothetical efficient operator supplies the UBA service over, we are no longer of the view that we are restricted to presupposing that the underlying access network is Chorus' copper network.

746. Accordingly, we have considered the following two options for determining the MEA for the UBA service:[300]

    746.1 A UBA network that is built over an optimised access network that replaces the existing copper network; and

    746.2 A UBA network that is built over the existing copper access network.

747. We consider that a MEA for the UBA service that presupposes an underlying copper access network will likely better allow for competition through unbundling where it is efficient. This is because access seeker decisions regarding unbundling are made in respect of the existing copper access network. Therefore, in our view a MEA for the UBA service that utilises an underlying copper access network better aligns efficient build/buy decisions with those made in the real world, compared to the case with the UBA network being built over a fibre access network.

748. Accordingly, on balance, our view is that section 18, and the requirement to consider relativity between the UCLL and UBA services (as previously explained in Chapter 1 and Chapter 4), lead us to prefer a MEA for the UBA increment that utilises a copper-based access network. Therefore, we have modelled the MEA for the UBA additional costs component based on a copper access network.

Analysis

749. The FPP for UBA is:[301]

> The price for Chorus's unbundled copper local loop network plus TSLRIC of additional costs incurred in providing the unbundled bitstream access service.

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300 When referring to the MEA for the UBA service we are referring to the MEA for the core network over which the UBA service is provided.

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

750. As we noted in Chapter 1, we take the price for the UCLL STD service and add to it the "TSLRIC" (as defined in the Act) of the additional costs incurred in providing the UBA service.

751. In the December 2014 UBA draft determination paper, our view was that MEA principles were only relevant to the "additional costs" component of providing the UBA service, and that we must presuppose that the MEA of those additional components would exist on Chorus' copper access network.[302]

752. However, as we explain below we are no longer of the view that we are restricted to the existing copper network as the underlying access network, but we consider that section 18 and relativity considerations mean that it is still appropriate.

753. Chorus supported our previous proposed approach, submitting that the Act presupposes that the MEA will be DSL technology deployed using Chorus' existing copper network, and that we are required to model the additional costs incurred to provide the UBA service over the UCLL copper inputs.[303]

754. However, a number of parties have criticised our view that the MEA must exist on Chorus' copper network. Vodafone submitted that having selected FTTH/FWA as the MEA for the UCLL service, we are required to use the same MEA for the UBA service:[304]

> More fundamentally, having selected a FTTH and FWA hybrid network as the MEA in respect of the UCLL service, the Commission is bound as a matter of law to adopt this same MEA in respect of the UBA service. A single MEA must be used for determining UCLL and UBA prices.

755. Vodafone provided an opinion from Paul Radich QC dated 11 February 2015. Mr Radich QC expressed the view that it would be an error of law not to use the FPP UCLL price as the first component of the UBA price.[305] We note that we do propose using the FPP UCLL price as the first component of the UBA price. The issue for UBA relates to whether the MEA for the UBA increment (that is, the second component of the UBA price) takes Chorus' copper access network as the starting point or is based on an optimised access network as the starting point.

756. Likewise, Wigley and Company submitted that, given the price for the UCLL service is derived from a fibre/FWA MEA, the only possible correct interpretation for determining the UBA increment MEA is to use the same fibre/FWA underlying access network.[306]

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302 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [227].

303 Chorus "Cross-submission on Draft UBA and UCLL pricing review determinations" CONFIDENTIAL, 20 March 2015, paragraph [212].

304 Vodafone "Submission on Draft UBA and UCLL pricing review determinations" CONFIDENTIAL, 20 February 2015, paragraph [C3].

305 Paul Radich QC "Memorandum to Vodafone - The use by the Commission of different MEAs when calculating TSLRICs for UCLL and UBA" 11 February 2015, paragraph [3].

306 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [18.29].

757. While we no longer hold the view that we are restricted to presuppose Chorus' copper access network, we disagree with Chorus, Vodafone, and Wigley and Company that we have no discretion in choosing the underlying access network on which the UBA network is to be constructed. We note Vodafone's submission that the UBA final pricing principle refers only to the price of the UCLL service not the network.[307]

758. The UBA final pricing principle provides little guidance regarding the underlying access network on which we determine the MEA for the UBA service. Although the Act imports the price for the UCLL service, our view is that we are not restricted to using this underlying access network to determine the price of the "additional costs" of the UBA service. The methodology used to determine the UCLL price should not restrict the methodology we use to determine the price for the UBA increment.[308] Rather, we must decide the underlying access network on which the UBA network is to be constructed and in doing so must have regard to what we consider best gives effect to the purpose of section 18.

759. We agree with Spark's submission that:[309]

> …the Act permits the Commission greater discretion than Chorus or Vodafone advocates. The Act does not require the Commission to use a MEA in the first place, which seems to us to preclude any statutory interpretation argument that it nevertheless requires the Commission to adopt any specific MEA.

760. Spark continued that if we are to use a MEA, we are required to exercise our discretion in a way that accords with the UBA FPP; and best gives effect to section 18. This requires a proper consideration of the options before us, and an informed choice as to which of those options best meets these two requirements.[310]

761. We agree. Accordingly, given our view that the underlying access network used by the hypothetical efficient operator is open to us, we must look at all the options available to the hypothetical efficient operator in considering the MEA for the UBA service. We set this out below.

Considering the MEA for the UBA service

762. The final pricing principle for the UBA service directs us to consider the TSLRIC for the "additional costs" component of the UBA service. We note Wigley and Company's submission that we need to resolve what the "additional costs" are that

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307 Vodafone "Submission on Draft UBA and UCLL pricing review determinations" CONFIDENTIAL, 20 February 2015, paragraph [C2]. See also Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [18.29(b)].

308 Although we accept that the UCLL MEA may inform our consideration for the UBA "additional costs" component MEA. In addition, the fact that the UBA and UCLL price applications were received at the same time, should also not restrict us in carrying out an FPP review.

309 Spark "UBA and UCLL FPP pricing review draft decision" CONFIDENTIAL, 20 March 2015, paragraph [100].

310 Spark "UBA and UCLL FPP pricing review draft decision" CONFIDENTIAL, 20 March 2015, paragraphs [101-102].

we are determining. Wigley and Company suggest that in the context of the Act, that would be the additional costs relative to the fibre/FWA or copper MEA.[311]

763. We agree that the MEA for UBA is dependent on the underlying access network that the hypothetical efficient operator supplies the UBA service over. Possible options that we consider open to us are:

763.1 Option 1 – the hypothetical efficient operator provides the UBA service by building a UBA network over an optimised access network; or

763.2 Option 2 – the hypothetical efficient operator utilises Chorus' copper network and builds a UBA network to provide the UBA service.

764. While we consider that both options would utilise an Ethernet based layer 2 aggregation network to transport the data traffic to the handover point, the active equipment required and the distance to the handover point is likely to differ. We further consider the implications of each approach, including the section 18 considerations, below.

765. Option 1 assumes that the hypothetical efficient operator deploys an efficient replacement network from the end-user to the handover point of the UBA service. That is, the hypothetical efficient operator replaces both Chorus' copper access network and core network to the handover point of the UBA service.

766. Given we have modelled an efficient replacement network for Chorus' copper network in the UCLL pricing review determination, under Option 1, we consider it reasonable to assume that this is the underlying access network on which we then determine the MEA for the UBA service.

767. Accordingly, given that the underlying access network is exchange-based only, the scope of the MEA for the UBA service in this case includes:[312]

767.1 optical network terminals to aggregate end-user traffic at the exchange;

767.2 backhaul from the exchange to the handover point; and

767.3 Ethernet aggregation switch equipment at the handover point.

768. Option 2 assumes that the hypothetical efficient operator utilises Chorus' copper network and the MEA for the UBA service is an efficient core network deployed from the MDF to the handover point of the UBA service.

769. In this case, the scope of the MEA for the UBA service includes:

769.1 DSLAMs to aggregate end-user traffic at the MDF;

311 Wigley and Company "Submission on draft pricing review determination for UBA and UCLL services" 20 February 2015, paragraph [18.29].

312 Note that this is not a complete list of the additional costs incurred but an illustration of the scope of the UBA increment.

769.2 backhaul from the cabinet to the exchange for cabinet based end-users;[313]

769.3 backhaul from the exchange to the handover point; and

769.4 Ethernet aggregation equipment at the handover point.

770. In considering the two potential options above, we have selected our MEA for the UBA service having taken into account our TSLRIC objectives/outcomes, section 18 considerations, and the requirement to consider the relativity between the UCLL and UBA services.

771. Spark submitted that while build/buy incentives can form part of our objectives for regulatory price setting, the current deployment of a subsidised FTTH network significantly reduces the incentive to build competing bitstream facilities through unbundling.[314] Spark preferred the objective of creating efficient price signals that approximate those we would expect to see in a competitive market.[315]

772. Spark also submitted that:[316]

> The "right" build/buy signals are those that best approximate the efficient forward-looking cost for the service. Just because an access seeker might need to buy DSLAMs and other DSL-based equipment in order to provide its own UBA service using Chorus' actual network, that does not necessarily mean that a copper UBA MEA will provide the "right" build/buy signals. By definition, for example, this MEA will import the inefficiencies of Chorus past network choices – choices that a competitive market would not be bound by.

773. We disagree with Spark. We consider that the price we set for the UBA increment that sets appropriate build/buy signals for access seekers better aligns with the section 18 purpose of promoting competition for the long-term benefit of end-users, particularly in regards to the relativity requirement.

774. We recognise that the current deployment of the UFB network, facilitated by government subsidy, may alter the incentives on access seekers to unbundle. However, we are of the view that we should not set a price that actively discourages or precludes competition through unbundling. Rather, our views regarding the relativity requirement of the Act are that we should set a price for the UBA increment that allows unbundling to occur where it is efficient.

775. While we acknowledge that a hypothetical efficient operator would likely deploy a UBA service over fibre, if it did not otherwise have access to an underlying access network, as it is considered to be future proof, we consider that a MEA for the UBA service that presupposes an underlying copper access network will likely better allow for competition through unbundling where it is efficient. This is because decisions

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313 We note that, in the case of a different underlying access network being used to price the UCLL service, we need to take into account whether the cost of this portion of the network is recovered by the UCLL price. We discuss this further in Attachment N: Cost allocation.

314 Spark "UBA and UCLL FPP pricing review draft decision" CONFIDENTIAL, 20 March 2015, paragraph [104].

315 Ibid, at paragraph [107].

316 Ibid, at paragraph [109].

regarding unbundling are made in respect of the existing copper network, and so a MEA for the UBA service that utilises an underlying copper access network better aligns efficient build/buy decisions with those made in the real world, compared to the case with an alternative MEA built over an optimised access network. Indeed, a MEA that utilises an optimised access network may in fact undermine incentives for unbundling to occur where it is efficient.

776. Accordingly, on balance, our view is that section 18, and the requirement to consider relativity, under section 19(b) of the Act, between the UCLL and UBA services, leads us to prefer a MEA for the UBA increment that utilises a copper access network. Therefore, we have modelled the MEA for the UBA service based on an underlying copper access network.

777. In terms of relativity we have considered the reality of the situation; which is that there is an underlying copper access network in place and we need to be mindful of the level of the impact this could have on relativity between UCLL and UBA if we were to model a MEA for the UBA network over a fibre access network. We invite submissions in this regard.

778. While we have set the cost of the UBA increment using a MEA for the UBA network that utilises an underlying copper access network, we have also modelled the cost-based on an underlying fibre access network. We note that there is minimal difference in the cost of the UBA increment between the two approaches.[317]

UBA service characteristics

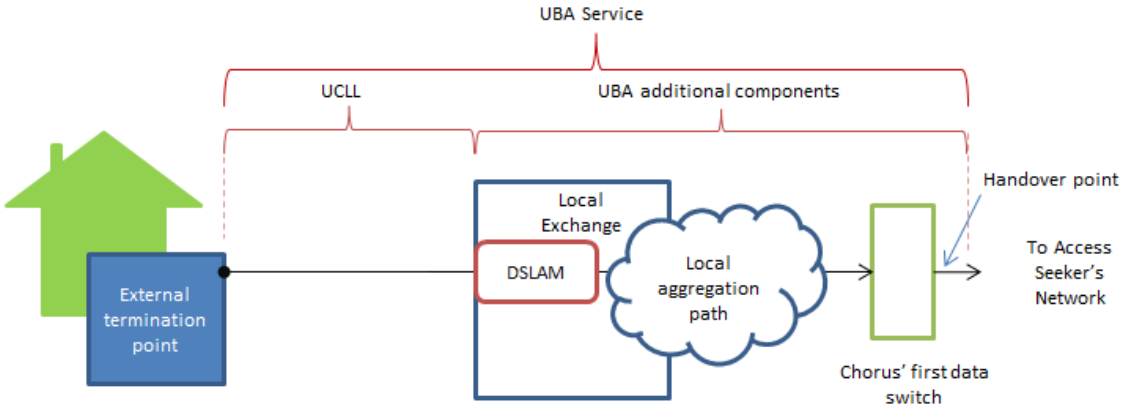
779. The UBA STD describes the UBA service as "a DSL service that enables access to, and interconnection with, that part of Chorus' fixed public data network (PDN) that connects the end-user's building (or, where relevant, the building distribution frames) to Chorus' first data switch (or equivalent facility), other than the DSLAM".[318] This is illustrated below:[319]

[317] A switch is included in the UBA model that allows users to switch between a copper and fibre underlying access network.

[318] Commerce Commission "Standard Terms Determination for Chorus' Unbundled Bitstream Access Service", Schedule 1 UBA Service Description, clause 2.2.

[319] This is a logical diagram and does not describe any technical build.

Figure 3: The UBA service



780. We note that the UBA Service Description in the STD requires that the UBA service provide a minimum throughput of 32kbps during any 15 minute period.[320] Specifying a minimum throughput metric allows for the average throughput level to evolve with changing end-user needs – that is, specifying a minimum throughput does not imply that the service is static or capped. We are aware that Chorus, and Telecom before it, provides average throughput well in excess of 32kbps, which it has to this point increased over time to match increasing end-user throughput requirements. Given that the STD does not prescribe the average throughput of the UBA service we are setting the price of, we need to determine the level of throughput.

781. We consider that a hypothetical efficient operator would deploy a UBA network capable of meeting current and future end-user throughput requirements and that the UBA service provided would be dynamic and evolve over time as throughput requirements increase.

782. In the December 2014 UBA draft determination paper we noted that Chorus' existing DSLAM engineering provides for at least a single GigE backhaul per sub-rack. Our view was that this would be consistent with the level of capacity a hypothetical efficient operator would deploy.[321] Accordingly, we modelled a single GigE backhaul per sub-rack.[322]

783. However, Chorus submitted that the model should be amended to account for changes to network assets required by future bitstream throughput increases.[323] Chorus recommended forecasting a per annum growth rate of 50%, which it considered to be consistent with a number forecasts by other agencies.[324]

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320 Commerce Commission "Standard Terms Determination for Chorus' Unbundled Bitstream Access Service" Schedule 1 UBA Service Description, clause 3.12.

321 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [241].

322 For more information, see TERA "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services - Model Specification" November 2014, section 7.3.1.

323 Chorus "Submission on Draft UBA and UCLL pricing review determinations" CONFIDENTIAL 20 February 2015, paragraph [198].

324 Ibid, at paragraph [535].

784. WIK, in behalf of Vodafone and Spark, recommended a growth rate of approximately 40% should be adopted, given uncertainty going forward.[325]

785. Our view is that a hypothetically efficient operator would ensure that its UBA network was capable of meeting increasing bitstream throughput requirements. We would expect the hypothetical efficient operator to upgrade its equipment as it reached capacity. We consider the sources used by Chorus to provide its forecast growth rate persuasive. Accordingly, we have assumed a 50% per annum growth rate in traffic. TERA has included the cost additional network elements are required to meet the growing bitstream throughput.

786. Our view remains that, if, as a result of meeting increasing bitstream throughput over time, Chorus' costs materially increased, it could request that we initiate a section 30R review to consider if it is necessary to update the price.

[325] WIK-Consult "Cross-submission on Draft UBA and UCLL pricing review determinations" CONFIDENTIAL 19 March 2015, paragraph [165].

Attachment C: Network optimisation

Purpose

787. This Attachment sets out our further draft decisions on the:

787.1 degree of optimisation in the core model;

787.2 optimisation of exchange buildings in the model;

787.3 optimisation of active assets; and

787.4 use of private roads, motorways, access ways and railway corridors in the model.

Our further draft decisions

Degree of optimisation

788. We have adopted an optimally structured core network approach which is constrained only by the existing number of FDS in Chorus' copper network and their existing locations, and follows the road network. All other aspects of the core network are open to optimisation.

789. We have implemented minor modifications to take into account the location of notional nodes and network connectivity constraints imposed by the adoption of a theoretical network that is based on the road network.

Optimisation of exchange buildings

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

791. Where available, we have used data provided by Chorus to complement the bottom-up calculation to model the most efficient deployment.

Optimisation of active assets

792. The active assets in the core model have been optimised based on the relevant demand. Accordingly, TERA has calculated the necessary number of assets required to meet that demand.

Treatment of private roads and motorways

793. The model includes use of motorways as, in our view, an 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

794. In December 2013 we set out the following approaches to optimising the modelled network:[326]

794.1 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.

794.2 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).

794.3 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.

794.4 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.

795. 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.[327]

[326] 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].

[327] 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].

796. 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.[328]

797. In our December 2014 UBA 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.[329] Neither approach says anything about the costs of those parts of the network that are considered immovable.

798. We therefore disagreed with Wigley and Company and found that the Act afforded us discretion in the degree of optimisation built into the model.

799. 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:

    799.1 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

    799.2 regulators in other countries have also typically adopted a scorched node or modified scorched node approach.[330] 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.

800. 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.[331] In our view, this strikes an appropriate balance of the considerations described above when considered in light of our TSLRIC objectives/outcomes.

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328 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].

329 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraphs [441-442].

330 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].

331 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [443].

801. In its submissions to our December 2014 UBA draft determination Chorus generally supported the use of the modified scorched node approach as being consistent with orthodox TSLRIC.[332]

802. Chorus did however raise three concerns regarding the level of optimisation:[333]

802.1 Modelling exceeds network deployment guidelines.

802.2 Modelling assumes the availability of motorways and private roads for network deployment, without accounting for the additional costs of access.[334]

803. 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.[335]

804. 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.[336]

805. Spark also agreed that a modified scorched node approach is a common approach taken by regulators internationally and supported its application.[337]

806. While Spark agreed to the use of the modified scorched node approach, it found that the number and locations of FDS in the UBA network should be optimised compared to Chorus' copper network.[338]

807. 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.

808. 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

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332 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].

333 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].

334 As this submission relates to the use of motorway and private roads, it will be address later in this Attachment.

335 Analysys Mason "report for Chorus - UCLL and UBA FPP draft determination cross-submission" CONFIDENTIAL, 20 March 2015, p. 7.

336 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 26.

337 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [59].

338 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [59c].

assets.[339] As with Spark's similar submission on asset re-use, we address this submission as part of our draft decision of asset valuation.

809. WIK also argued that modelling the locations and number of the FDS nodes based on Chorus' copper network wouldn't necessarily be the most efficient approach.[340]

810. Wigley and Company found that – given the constraints of scorched node approach – the TERA model route length algorithm appeared appropriate and provided appropriate optimisation.[341]

811. 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 UBA draft decision, where assets were not re-used.[342] As with Spark's similar submission on asset re-use, we address this submission as part of our draft decision of asset valuation.

812. 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.[343] We have reviewed this document and we agree with TERA's proposed responses to the submissions made.

Analysis

813. Following submissions and cross submissions we have further considered the nature of our hypothetical efficient operator and how this impacts our choice of UBA network optimisation of the local aggregation path between the DSLAM to the FDS.

814. We do not agree with Spark and WIK that the UBA network could be optimised by eliminating or removing FDS.

815. This is because optimising by eliminating or moving FDS simply amounts to shifting cost between the access network and the core network. This may not materially

339 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].

340 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 [96].

341 Wigley and Company "Submission on backdating in relation to draft UCLL and UBA pricing review determinations" 20 February 2015, paragraph [3.1].

342 Wigley and Company "Submission on backdating in relation to draft UCLL and UBA pricing review determinations" 20 February 2015, paragraphs [12.1-12.4].

343 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.

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.[344]

816. As the number of FDS increases, the average length of the local aggregation path decrease. 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).

817. This analysis tells us that eliminating or moving FDS when modelling the UBA network does not amount to optimisation in an efficient sense. Changing the number of "handover points" simply shifts how much of the local aggregation path from the FDS to the DSLAM is included in the UBA increment and how much the access seeker will have to pay for separately. Further, we note that it is only the locations of these FDS that we are treating as fixed. We have considered the case for optimisation of all other aspects of those FDS.

818. 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 DSLAM and the FDS is included in the UBA increment.

819. We also consider that there are a number of other factors which support the case for keeping the FDS locations fixed, as follows:

819.1 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.

819.2 Deploying a network by eliminating or moving FDS involves a great deal of technical uncertainty which requires a large judgement call leading to larger risk of regulatory error.

819.3 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.

820. Having decided on this approach to optimisation, we disagree that the number and location of DSLAMs and FDS should be optimised.

821. 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.

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[344] 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.

822. The updated trenching costs analysis from Beca includes the costs of reinforcing.

Optimisation of exchange buildings

Submissions

823. In our December 2014 UBA 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.

824. Modelling the actual size of Chorus' sites is equivalent to a top-down approach to costing buildings. A top-down approach would base the modelled cost on the cost of the actual buildings and on Chorus providing a service it no longer provides (PSTN-voice).

825. 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.

826. 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.

827. We also used data provided by Chorus regarding relevant modern sites consisting of blueprints of a number of sites and linking 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

828. We have not received any submissions regarding the optimisation of the size of exchange buildings.

829. 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.

Optimisation of active assets

Submissions and analysis

830. In our December 2014 UBA draft determination paper, we optimised the active assets in the core model that have been based on the relevant demand. As such, the power consumption and the air conditioning requirements reflected the modern assets being modelled.

831. While we have not received any submissions regarding our specific draft decision to optimise the active assets in the core model based on the relevant demand, we have, as mentioned earlier, 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.[345] We have reviewed this document and we agree with TERA's responses to the submissions made.

832. Where these technical submissions have been found to be relevant, we have changed the model, however, they have not led us to change our general approach to optimisation of active assets.

Use of private roads and motorways in the model

Submissions

833. In our December 2014 UBA 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:[346]

> **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).

834. 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.[347] Information provided by the telecommunication companies shows that fibre network is regularly placed on private land and motorways.[348] 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.

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345 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.

346 Telecommunications Act 2001, s 5.

347 National Code of Practice for Utility Operators' Access to Transport Corridors, paragraph 4.1.1.

348 Notice to Supply Information to the Commerce Commission Sections 98(a) and (b) Commerce Act 1986, 17 April 2014, paragraph [6.5].

835. 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.

836. 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

837. As stated above Chorus has submitted that the potential additional costs of accessing motorways and private roads have not been included.[349]

838. We agree that we have not included an additional cost for accessing motorways.

839. The reason for this is that the cost weighting in the model is not the same as the cost of providing the service.

840. 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 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.

841. As a result, the model only includes trenching along 34 metres of motorway.

842. The way the cost weighting has been used for the private roads in the model provides for two key scenarios.

842.1 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.

842.2 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.

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[349] 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 [93.3].

843. 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.

844. 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: Infrastructure sharing

Purpose

845. This Attachment sets out our further draft decision on the level of underground infrastructure sharing with utility companies.

Our further draft decision

846. Include 5% of underground infrastructure sharing with utility companies.

Underground infrastructure sharing

847. Infrastructure sharing is relevant for the UBA service. We consider the hypothetical efficient operator would seek such efficiencies in relation to the local aggregation path (LAP), which covers the trench and duct between the DSLAM and FDS locations.

Submissions

848. In our December 2014 UBA draft determination paper we did not consider the possibility of the hypothetical efficient operator sharing underground infrastructure with utility companies.

849. Consequently, underground infrastructure was not shared with utility companies.

850. In its submissions to our December 2014 UBA draft determination, 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.[350]

851. WIK considered infrastructure sharing to be:[351]

    851.1 state of the art in other jurisdictions;

    851.2 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;

    851.3 an option a hypothetical efficient operator would try to exploit.

852. 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 would be in the range of 5% to 30% of trenching cost.[352]

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350 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].

351 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].

853. In its submissions to our December 2014 UBA draft determination, Networks 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.[353]

854. In its submissions to our December 2014 UBA draft determination, Spark stated that it is currently involved in an increasing number of trench sharing projects with several other utilities, and expected this practice to continue to increase in prevalence.[354]

855. In its submissions to our December 2014 UBA draft determination, Vodafone quoted a 2012 Chorus' investor presentation, saying:[355]

> 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 re-using 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.

856. In its submissions to our December 2014 UBA draft determination paper, Chorus acknowledged that some degree of asset sharing should be allowed for network deployed underground but considered that this should be limited to 5%.[356]

Analysis

857. 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.

858. 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.

859. It is therefore our view that underground infrastructure sharing in practise is only possible in cases where the different kinds of infrastructure are being rolled out simultaneously.

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352 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].

353 Network Strategies "Final report for Spark New Zealand and Vodafone New Zealand - Modelling Fixed Wireless Access" CONFIDENTIAL, 20 February 2015, pp. 47-50.

354 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [68].

355 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].

356 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].

860. 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.

861. 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.

862. According to Vector, the decision to underground in specific areas depends on a number of criteria, including:[357]

862.1 the condition of the lines and equipment in the area;

862.2 their performance history (capacity and faults);

862.3 the number of customers who will benefit; and

862.4 the level of other utility works planned for each area.

863. 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.

864. 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.

865. 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 and telecommunication companies is taking place in both New Zealand and overseas.

866. 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 our hypothetical efficient operator could sensibly do.

867. In order to determine what percentage of underground infrastructure sharing can be considered, we have looked at data from the LFCs.

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357 http://vector.co.nz/undergrounding.

868. UltraFast Fibre shares between [ ]UFFCI of its underground network with other utilities (depending on areas) with the average for the total network being [ ]UFFCI.

869. Enable lists the level of trench sharing as [ ]ECI.

870. 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%.

871. The combination of the percentages provided by LFCs, Chorus' submission and the lower end of WIK's range leads us to include 5% of underground infrastructure sharing with utility companies.

Attachment E: Asset valuation

Purpose

872. In this Attachment we set out our current view on the appropriate asset valuation methodology to be used in our TSLRIC model for the UBA service.

Our further draft decision

873. 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:

873.1 ORC is consistent with our framework for carrying out the UBA pricing review determination and the concept of the hypothetical efficient operator, ie the hypothetical UBA network is built from the ground up, and is not constrained by the legacy choices made regarding the existing UBA network that provides the regulated services.

873.2 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.

873.3 Section 18 purpose statement considerations.

874. Please refer to Attachment E of the UCLL July 2015 further draft determination for our reasons and a detailed analysis of the issues around our asset valuation draft decision. As we are applying a similar conceptual economic framework to determine a TSLRIC price for the UBA service as we have used for the UCLL service, we consider that the asset valuation principles discussed in Attachment E of the UCLL July 2015 further draft determination are also relevant for the UBA service, subject to the following paragraph.

875. As explained in Chapter 1, the modern equivalent asset principles are only relevant to the "additional costs" component of providing the UBA service (which is the "UBA increment"). Therefore, the asset valuation principles are only relevant to the "UBA increment".

Attachment F: Asymmetric risk

Purpose

876. This Attachment outlines how we have treated the issue of compensation for asymmetric risks in our TSLRIC model for the UBA service.

Our further draft decisions

877. Our further draft decisions in respect of asymmetric risks are:

877.1 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;

877.2 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

877.3 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

878. 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:[358]

878.1 risks that arise through infrequent events that could produce large losses, such as natural disasters and terrorist threats; and

878.2 risks that derive from events such as the threat of technology change, competitive entry or expansion.

879. 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:

879.1 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

[358] See Commerce Commission "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper" 22 December 2010, paragraph [H12.4].

879.2 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.

880. In our December 2014 UBA draft determination paper, we considered whether to provide for an *ex ante* allowance for asymmetric risks in the following four categories:[359,360]

880.1 Catastrophic risks.

880.2 Asset stranding due to technological change.

880.3 Asset stranding due to competitive developments.

880.4 Asset stranding due to future regulatory decisions (re-optimisation).

881. In the sections below we outline our approach to the treatment of asymmetric risks for each of these categories.

Catastrophic risks

882. Our further draft decision is 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 as the best available information on the likely costs incurred by our hypothetical efficient operator.

883. For a detailed discussion of our reasons and our analysis of the issues in respect of catastrophic risk, please refer to Attachment F – Asymmetric risk of our July 2015 UCLL further draft determination. As we are applying a similar conceptual economic framework to determine a TSLRIC price for the UBA service as we have used for the UCLL service, we consider that the principles regarding catastrophic risks discussed in Attachment F of the July 2015 UCLL further draft determination are also relevant for the UBA service.

Asset stranding due to technological change

884. Our further draft decision is that, 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. For a detailed discussion of our reasons and our analysis of this issues, please refer to Attachment F – Asymmetric risk of our July 2015 UCLL further draft determination. As we are applying a similar conceptual economic framework to determine a TSLRIC price for the UBA service as we have used for the UCLL service, we consider that the principles regarding asset stranding risks discussed in Attachment F of the July 2015 UCLL further draft determination are also relevant for the UBA service.

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359 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [538.2].

360 We noted also in our December 2014 UBA 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.

885. We then turn to the question raised by submissions of Chorus, CEG and L1 Capital, which is whether adopting Chorus' asset lives adequately compensates for this risk.

886. Chorus submitted that adopting Chorus' asset lives does not compensate for the risk of asset stranding due to technological change.[361] 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.[362] CEG noted 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.[363]

887. 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.[364]

888. 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.

888.1 Chorus' 2014 Financial Statements noted that:[365]

> 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 advances, the likelihood of Chorus ceasing to use the asset in its business operations and the effect of government regulation.

888.2 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.[366]

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361 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].

362 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 [679].

363 CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [96].

364 L1 Capital "Submission on draft UCLL and UBA pricing review determinations" 20 February 2015, p. [12].

365 Chorus, "Financial Statements for the year ended 30 June 2014" August 2014, p. 10.

888.3 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".[367]

889. 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.

890. We note also L1 Capital's view referred to above that, at least for assets with a shorter economic life (which is particularly the case for certain assets used in the UBA service, such as DSLAMs), auditors can incorporate some of the issues relating to stranding risk because they can observe a regular pattern of replacement.

891. 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.[368]

892. 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 the hypothetical efficient operator.[369] While we do not dispute the mathematical analysis underlying CEG's claim,[370] 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 CEG appears to acknowledge[371]), there is unlikely to be any

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366 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 294.

367 Chorus "Commission's follow up questions following FPP conference" Confidential, 12 May 2015, Question 3.

368 We note that in Attachment F – Asymmetric risk of our July 2015 UCLL further draft determination we included an analysis comparing the economic lifetimes of the assets used in our TSLRIC model for the UCLL service with their engineering lifetimes, including calculating the implied increment to the discount rate to equate the present value of the economic lifetime with that of the engineering lifetime. We did not obtain data on engineering lifetimes for the relevant asset used in our TSLRIC model for the UBA service, and we have therefore not conducted a similar analysis in respect of the UBA service. Nonetheless, we consider that the remaining analysis discussed in this Attachment supports our draft decision in respect of compensation for asymmetric risks in the TSLRIC model for the UBA service.

369 CEG "Uplift asymmetries in the TSLRIC price" CONFIDENTIAL, February 2015, paragraph [104].

370 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.

371 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 – Commerce Commission, "UBA and UCLL pricing review determination conference transcript", 15-17 April 2015, p. 296.

robust and objective basis for determining multiple possible lifetimes (and the associated probabilities of occurrence) for a given asset.

893. 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".[372]

894. 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

895. Our further draft decision is that no *ex ante* compensation should be provided for the asymmetric risk of asset stranding associated with competitive developments. For a detailed discussion of our reasons and our analysis of this issues, please refer to Attachment F – Asymmetric risk of our July 2015 UCLL further draft determination. As we are applying a similar conceptual economic framework to determine a TSLRIC price for the UBA service as we have used for the UCLL service, we consider that the principles regarding asset stranding risks discussed in Attachment F of the July 2015 UCLL further draft determination are also relevant for the UBA service.

Asset stranding due to future regulatory decisions

896. Our further draft decision is that it is not appropriate to include any *ex ante* allowance for the asymmetric risk associated with future regulatory determinations. For a detailed discussion of our reasons and our analysis of this issues, please refer to Attachment F – Asymmetric risk of our July 2015 UCLL further draft determination. As we are applying a similar conceptual economic framework to determine a TSLRIC price for the UBA service as we have used for the UCLL service, we consider that the principles regarding asset stranding risks discussed in Attachment F of the July 2015 UCLL further draft determination are also relevant for the UBA service.

[372] 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].

Attachment G: Depreciation

Purpose

897. In this Attachment we set out how we have treated regulatory depreciation in our model for the UBA service.

Our further draft decision

898. Our further draft decision remains that the tilted annuity method is the appropriate methodology for regulatory depreciation.[373] This approach combines an allowance for depreciation with the return on capital.

899. This approach is consistent with the regulatory framework principle to reflect the efficient costs of the hypothetical efficient operator.

900. Please refer to Attachment G of the UCLL July 2015 further draft determination for our reasons and a detailed analysis of the issues around our treatment of regulatory depreciation. We consider that the same approach to depreciation for UBA and UCLL is appropriate as this ensures consistency in the depreciation treatment of those assets that are shared by both services.

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

Attachment H: Setting asset lives

Purpose

901. This Attachment sets out our approach to determining the asset lives used in our TSLRIC model.

Our further draft decision

902. Our further draft decision is to use Chorus' 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:

    902.1 We consider that the accounting asset lives provided by Chorus are an appropriate starting point for the asset lifetimes in our TSLRIC model, and provide a reasonable estimation of the economic lives of the relevant assets of the hypothetical efficient operator;[374] and

    902.2 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.[375] We have reviewed TERA's analysis and agree with the conclusions.

903. 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 – Asymmetric risk.

Our framework for assessing asset lives in the UBA pricing review determination

904. Using asset lives that understate the economic lives for assets (for long-lived assets such as the fibre link from the DSLAM to the FDS) 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.[376]

905. Conversely, using asset lives that overstate the economic lives (for short-lived assets such as DSLAMs) would result in the hypothetical efficient operator being under-compensated.

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374 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.

375 The asset identified was DSLAMs, and is further discussed in this Attachment.

376 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].

906. 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.[377]

907. Chorus, in its submission stated 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 the hypothetical efficient operator are all new.[378]

908. Yet, Chorus, in its cross submission, stated that WIK's argument is overly simplistic. Chorus stated that:[379]

> 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.

909. 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

910. In our December 2014 UBA 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 have used international benchmarks derived from TSLRIC models overseas.[380]

911. 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 make.

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377 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].

378 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 [282].

379 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].

380 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [274-277] and Attachment E and Attachment D.

912. We have used 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:[381]

> 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.

913. 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' 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.

914. TERA found that Chorus asset lifetime for DSLAMs of [ ]CNZCI is significantly lower than any of the benchmark data collected:

914.1 8 years in Ireland;[382]

914.2 8 years in Denmark; and

914.3 Similar results were found for other countries (for which the data are confidential).

915. We have reviewed TERA's analysis and we agree with the conclusions. We consider that the rate of technology change is not so high as to justify investment in replacement DSLAMs every [ ]CNZCI. Accordingly, to avoid significant cost over-recovery, we have retained an intermediate value of seven years for DSLAM asset lives.

916. In response to our December 2014 UBA draft determination paper, WIK argued that the asset lifetimes used in our draft TSLRIC model are too short.[383] WIK provided no international benchmarks or any evidence for assets related to UBA.

917. Chorus responded to the WIK submission that we need to consider international comparisons. Chorus submitted that there is nothing in international comparisons to suggest that the economic lives for Chorus are inappropriate.[384] The comparisons provided by Chorus, relevant to UBA, are shown in Table 8 below.

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381 Chorus "Commission's follow up questions following FPP conference" CONFIDENTIAL, 12 May 2015, Question 3.

382 ComReg "Response to Consultation Document No. 09/11: Review of the regulatory asset lives of Eircom Limited" 11 August 2009. We note that Ireland was not a comparable country in the UBA IPP determination. However, TERA indicated that if it were to consider other countries, the outcome would be the same.

383 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].

384 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

Table 8: Summary of asset lifetimes in our TSLRIC model and asset lifetimes raised in submissions to our December 2014 UBA draft determination paper (years)

	Economic lifetime used in our TSLRIC model	Denmark provided by Chorus	Sweden provided by Chorus
Power	15	15	10
Cooling	15	15	10

Source: Draft TSLRIC model and submissions to the December 2014 UBA draft determination

918. This table suggests that, based on international comparisons, the asset lifetimes used in our model are appropriate.

919. 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 UBA service.

920. We discuss our analysis in respect of whether the asset lifetimes appropriately address the asymmetric risk of asset stranding in Attachment F – Asymmetric risk.

Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL, 20 March 2015, paragraph [338] and Figure 12.

Attachment I: Price trends

Purpose

921. 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.

922. We commissioned NZIER to provide advice on long-term prices for this FPP pricing review.[385] The NZIER report is published with this further draft determination.

Our further draft decision

923. Our further draft decision is as follows:

923.1 For active assets using international benchmarks. Our 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.[386]

923.2 For passive assets using a cost escalation approach. The cost escalation approach can be summarised as follows:

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

923.2.2 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, to assess the ODF price trend which is used on the UBA increment calculation, a weighted average of LCI and fabricated steel indexes are used.

923.3 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.

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385 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission, May 2015).

386 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 9: 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%)
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

923.4 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%.

923.5 In relation to labour-related opex, our further draft decision is also 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.

923.6 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.

What we said in the December 2014 UBA draft determination paper

924. In our December 2014 UBA 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.[387]

925. For active assets we used average price trends based on international benchmarks. International benchmarks included were Australia, Denmark, Sweden, France and Norway.

926. For passive assets we used a cost escalation approach using appropriate price indexes. In particular, we determined the long-term price trend for:

926.1 building costs based on the number of dwellings;

926.2 miscellaneous material parts based on the CPI;

926.3 installation parts of assets based on the LCI;

926.4 material part of ODF/MDF based on an independent fabricated steel;

926.5 material part of optical fibre cables based on a fibre optic cabling index; and

926.6 we used CPI as the default price index for other inputs.

927. For opex, we used a different approach depending on whether the opex is labour or non-labour related.

927.1 For labour-related opex we used a cost escalation approach using the LCI.

927.2 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.

928. 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 UBA draft determination paper, and our response to submissions

929. This Attachment now considers the submissions received on our December 2014 UBA determination paper with regard to our approach to determine the long-term price trends for active and passive assets, opex and currency conversion.

[387] Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [278-282] and Attachment F.

Converting foreign exchange rates to New Zealand dollars

930. In the December 2014 UBA draft determination paper, we converted foreign currency to New Zealand dollars using PPP rates, with 2013 being held constant for the regulatory period.

931. 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.[388]

932. CEG submitted we should not use PPP but only market exchange rates as steel is an international market.[389] Network Strategies, in its cross submission, stated that the use of market exchange rates are preferable to use rather than blended exchange rates.[390]

933. 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.[391]

934. 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.

935. We propose to use the same approach to convert foreign exchange rates to New Zealand dollars for this pricing review. This implies that:

    935.1 for price series relating to tradable capital inputs only, we will use market exchange rates;

    935.2 for price series with non-tradable components only, such as labour, we will use PPP rates only; and

    935.3 for price series relating to both tradable capital inputs and non-tradable components, we will use the blended approach.

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388 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.

389 CEG "Evidence on price trends" CONFIDENTIAL February 2015, paragraph [55-62].

390 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.

391 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.

936. For example, for fabricated steel we will only use market exchange rates to convert foreign currencies to New Zealand dollars.

Price trends should be constant, and over the lifetime of the asset

937. 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.[392] 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.[393]

938. 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.

939. CEG indicated that the modelled price trend must be constant over time.[394] In its cross submission, Network Strategies agreed with CEG that price trends must be constant over the asset's lifetime.[395] 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

940. Network Strategies submitted that price trends must be forward-looking; past trends may not be appropriate to project forward-looking trends.[396] Contrary to Network Strategies' view that forecasts for the regulatory period be used, Chorus supports the use of long-term forecasts and historical information.[397]

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392 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraph [3-6]; and [30-36], and [67]; 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 [328].

393 CEG "Evidence on price trends" CONFIDENTIAL February 2015, p. 51.

394 Ibid, at paragraph [20-29].

395 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.

396 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.

397 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].

941. 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.[398]

942. 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

943. 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.

944. A number of active equipment price trends are required in the UBA increment calculation:

944.1 DWDM links (active part)

944.2 DSLAM (card/subrack/rack)

944.3 Switches/routers (card/subrack/rack/SFP)

944.4 Power equipment

944.5 Air conditioning equipment

945. Network Strategies criticised the inclusion of Australian data as the data used is over 5 years old and historic and should be omitted.[399, 400] CEG, in its cross submission, disagreed with Network Strategies recommendation to exclude Australia.[401]

946. 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.[402] The inclusion of the Australian benchmark will have an impact on the long-term price trend for DSLAMs.

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398 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.

399 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.

400 Ibid.

401 CEG "Issues from submissions UCLL and UBA" March 2015, paragraph [68].

402 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.

947. 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.

948. Network Strategies also criticised the Card/Rack split used to set its price trends for DSLAMs and switches (these are based on benchmark data), and proposed that we rather use the split derived from the capex model. Network Strategies indicated that using the split derived in the capex model would make the price trend calculation consistent with the capex model. [403]

949. Our further draft decision is to adopt Network Strategies proposal and to use Card/Rack split taken from the CORE model instead of benchmark ones. The impact of this change is that the long-term price trend for DSLAMs would change from -4.80% to -4.24%, and switches from -4.98% to -4.70%.

950. Network Strategies also submitted that a more recent version of the Swedish model used in the benchmark data is available. [404] Vodafone also submitted that out of date data should either be updated or excluded.[405] We agree with submissions that we should update the data and use the most recent Swedish data in our TSLRIC model. TERA advised that the price trends in the new model are the same as the old Swedish model, so this should have no impact on the model.

951. The only difference is in that the latest version of the Swedish model includes price trends input for power and air conditioning that have not been used in our draft TSLRIC model. [406] TERA advised that the Swedish inputs for power and air conditioning should be used. We agree with TERA because it reflects the most recent data and best estimate for a long-term price trend for power and air conditioning. The impact of this change is the long-term price trend for power would change from 0.80% to 1.00%, and air conditioning would change from 0.50% to 0.80%.

Approach we use to estimate long-term price trends for passive equipment

952. We used a cost escalation approach to determine the price trend for passive equipment in the December 2014 UBA draft determination paper. The cost escalation approach can be summarised as follows:

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

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403 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.

404 Ibid.

405 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 H2.

406 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.

952.2 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, (eg, to assess the ODF price trend which is used on the UBA increment calculation, a weighted average of LCI and fabricated steel indexes are used.

953. CEG submitted that TERA used averages rather than long-term price trends.[407] CEG also submitted that TERA has not used forecasts, and only historic information.[408]

954. 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.[409] Network Strategies proposed that forecasts should be used to assess price trends instead of historic trends.[410]

955. 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.[411]

956. In the alternative, CEG proposed using a regression model where the log of the price is assumed to be linear.[412] 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.[413] 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 even if the overall fit is good, the model may be a poor predictor of forward-looking prices over the medium term.[414]

957. 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.

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407 CEG "Evidence on price trends" CONFIDENTIAL February 2015, paragraph [3-6]

408 Ibid.

409 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.

410 Ibid.

411 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission, May 2015) p. 7.

412 CEG "Evidence on price trends" CONFIDENTIAL February 2015, paragraph [42-43].

413 Ibid.

414 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

958. In this regard, NZIER recommended that the most robust approach is one of the following approaches, depending on the data and information available:

958.1 Qualitative judgement based on policy targets.

958.1.1 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.

958.2 Trends modelled using benchmark prices, to deal with stochastic trends. Most of the series we consider have stochastic trends.

958.2.1 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.

958.2.2 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.

958.3 Arithmetic averages of annual average percentage growth rates.

958.3.1 Trends are calculated based on annual average growth rates. This ensures that the growth rates are less affected by volatility.

958.3.2 Arithmetic averages of annual average percentage growth rates are also an *unbiased* estimate of the trend in a random walk.

959. 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.

960. We will now turn to the determination of long-term price trend for the relevant raw indexes.

Long-term price trend based on CPI

961. In the December 2014 UBA 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%.

962. CEG submitted that the CPI should be decreased to be consistent with the Reserve Bank inflation target.[415] Vodafone and Network Strategies submitted that they agree

[415] 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.

with CEG that a reduction in 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.[416, 417]

963. 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:[418]

> 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]

964. 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

965. In the December2014 UBA 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%.

966. CEG submitted that the price trends model wrongly uses the trend in the number of buildings as a proxy for buildings price trends.[419] CEG submitted that the price trend for building costs should be based on Statistic New Zealand Capital Goods Price Index (CGPI) for non-residential buildings, from 1989 to March 2020, resulting in a price trend of 2.33%.[420]

967. 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.

968. We agree with NZIER's recommendation because it includes the appropriate construction costs and excludes maintenance costs. This series is also based on the

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416 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.

417 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.

418 The current agreement, signed in 2012, is available at: http://www.rbnz.govt.nz/monetary_policy/policy_targets_agreement/.

419 CEG "Evidence on price trends" CONFIDENTIAL February 2015, paragraph [46].

420 Ibid, at paragraphs [46] and [92].

price of buildings rather than the number of dwellings, previously used in our determination.

969. 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%.

970. 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.

971. 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

972. We used the LCI for all industries, and TERA estimated a price trend from 1994 to 2014 at 2.58%.

973. 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.[421] CEG estimated the price trend from December 1992 to March 2019 at 2.20%.

974. 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.[422, 423] Network Strategies submitted that we should use the LCI for all industries, and estimated the price trend from 2014 to 2019 at 2.20%.

975. 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.

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421 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 [308.1], CEG "Evidence on price trends" CONFIDENTIAL February 2015, paragraph [51-54].

422 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.

423 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.

976. 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.

977. 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%.

978. 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

979. To forecast opex for 2015 and the subsequent years, we used a cost escalation approach for labour-related opex in our December 2014 UBA draft determination paper.[424] 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.

980. WIK submitted that we need to assume that the hypothetical efficient operator also materialises opex related efficiency gains, and stated:[425]

> 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.

981. WIK further submitted that the productive efficiency gains should not be lower than 5%. WIK provided two international examples in this context:[426]

> 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

[424] Commerce Commission "Draft pricing review determination for Chorus' unbundled copper local loop service" 2 December 2014, paragraph [776f].

[425] 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].

[426] 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, paragraphs [151-152].

> 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 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.

982. 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.[427]

983. 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 UBA 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.

984. 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.

985. Our approach to productivity gains in Part 4 varies from determination to determination. For example:

985.1 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.[428]

985.2 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.[429, 430]

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427 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 [207-210].

428 Commerce Commission "Setting the customised price-quality path for Orion New Zealand Limited" 29 November 2013, paragraphs [N50-N51].

429 Commerce Commission "Default price-quality paths for electricity distributors from 1 April 2015 to 31 March 2020" 28 November 2014, paragraphs [3.24-3.34] (DPP determination).

986. In the current determination, we considered the following options to inform such an adjustment:

986.1 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.[431] We note that this productivity efficiency adjustment would be based on historic information and based on an industry much wider than UBA services.

986.2 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.

986.3 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.

986.4 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.[432] 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:[433]

> 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.
>
> 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

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430 We note that the consideration in the DPP determination considered both labour and non-labour related opex.

431 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.

432 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p. 422.

433 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.

987. 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 UBA 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

988. In the December 2014 draft determination paper, we used international steel prices to estimate the price trend for fabricated steel from 1995 to 2014 at 1.43%.

989. Chorus submitted that we should use forecasts for steel rather than historic information.[434] CEG proposed that we use the MEPS Asian steel series, and estimates the price trend from 1997 to 2022 at 1.76%.[435]

990. 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%.[436] 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.[437]

991. 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.

992. 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.

993. 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

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434 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 [308].

435 CEG "Evidence on price trends" CONFIDENTIAL, February 2015, paragraphs [55-58].

436 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.

437 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[438, 439]. This trend includes both historical relationships and expected future prices for international metal prices.

994. 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:[440]

> 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.

995. 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.

996. 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 fibre optic cables

997. In the December 2014 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%.

998. Submissions indicated that this series is inappropriate and unreasonable and is also driven by copper cables price evolution.[441, 442, 443]

999. CEG provided the following alternatives:[444, 445]

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438 Asia hot-rolled coil price, and consensus Economic surveys for short term forecasting because there is no public futures market for steel in Asia.

439 Based on LME market futures to December 2018 and an extrapolation of Consensus economic long-term forecasts to 2020 and beyond.

440 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission May 2015), Section 3.2.2.

441 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.

442 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 [308].

443 CEG "Evidence on price trends" CONFIDENTIAL February 2015, paragraph [63-71].

999.1 One option is based on the price Chorus pays its supplier for fibre cables (December 2002 and March 2014, is -15.7%);

999.2 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%);

999.3 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%).

1000. 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.[446] 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.[447]

1001. 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.

1002. 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.

1003. 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

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444 Ibid.

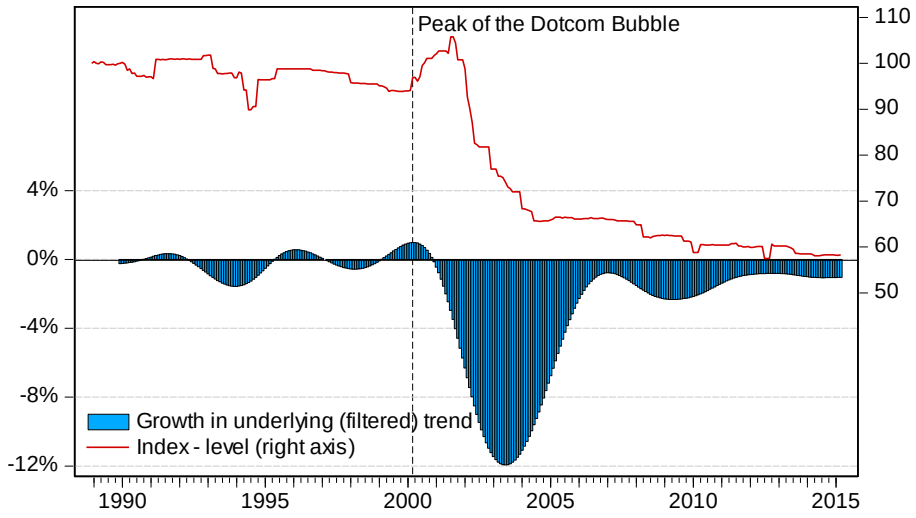
445 Chorus "Cross-submission for Chorus in response to Draft Pricing Review Determinations for Chorus' Unbundled Copper Local Loop and Unbundled Bitstream Access Services and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations" CONFIDENTIAL 20 March 2015, paragraph [329-330].

446 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.

447 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.

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.

Figure 4: 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

1004. 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.

1005. 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.

1006. 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 PPI seems to be reasonable.

1007. 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.

1008. 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).[448] 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.

1009. We also considered the price trends used in other jurisdictions. Table 1xx 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 10: 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

1010. 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.

1011. 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 steel to New Zealand dollars. However, we note that NZIER recommendation is that:[449]

> 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

1012. 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.

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448 See article at http://www.photonics.com/Article.aspx?AID=49953.

449 NZIER "Price trends for UCLL and UBA final pricing principle" (report to the Commerce Commission May 2015), p. 22.

Attachment J: Trenching costs

Purpose

1013. This Attachment sets out our further draft decisions on the source of trenching costs and the application of discount on trenching costs.

Our further draft decision

1014. We have sourced information regarding trenching and duct cost data from local costing experts Beca.[450]

1015. We have not included a discount for large scale roll-out on trenching costs.

Submissions and analysis

1016. Trenching costs are relevant for the UBA service, as they apply to the local aggregation path (LAP), which covers the trench and duct between the DSLAM and FDS locations.

1017. Please refer to Attachment J of the July 2015 UCLL further draft determination for our reasons and a detailed analysis of the issues relating to our trenching costs further draft decisions.

1018. These further draft decisions also apply to UBA, as BECA's trenching costs analysis does not distinguish between trenching costs in the access and the core network but provides an estimate of the average trenching costs for New Zealand.

1019. As explained in Chapter 1, the MEA principles are only relevant to the "additional costs" component of providing the UBA service (which is the "UBA increment"). Therefore, the trenching costs principles are only relevant to the "UBA increment".

[450] 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.

Attachment K: Capital contributions

Purpose

1020. The purpose of this section is to consider the type of capital contributions relevant for UBA and the treatment of these capital contributions in our UBA TSLRIC model.

Our further draft decision

1021. In our December 2014 UBA draft determination paper, we said "we have accounted for the cost of providing bitstream in RBI areas by removing the modelled TSLRIC costs relating to the number of DSLAMs and active cabinets deployed by Chorus under the RBI initiative."[451]

1022. We remain of the view that this is the appropriate treatment of RBI subsidies for UBA capital contributions.

Submissions on the December 2014 UBA draft determination paper

1023. In its submission, Chorus said that we had excluded the capital costs of significant volumes of DSLAMs, but it did not receive funding for these DSLAMs, and the hypothetical efficient operator could not require capital contributions for DSLAMs.[452]

1024. Spark submitted that RBI and UFB funding for network elements should not form part of the modelled cost.[453] Vodafone submitted that we must either consider only the network a profit maximising hypothetical efficient operator would build or assume the hypothetical efficient operator operates with the same policy settings as Chorus, therefore, receiving subsidies for both fibre and FWA roll-outs.[454]

Analysis

1025. Unlike the hypothetical efficient operator of our modelled UCLL network, the hypothetical efficient operator of our UBA network does not have an obligation (equivalent to the TSO) to serve a prescribed network footprint. Therefore, we assume that the hypothetical efficient operator of the UBA network does not seek or receive any capital funding from end-users to extend its network. We understand this is a relatively uncontentious assumption. Submissions have, however, focussed on the capital funding Chorus has received from government initiatives to improve and extend its UBA network.

1026. The government funding in question is, of course, the UFB and Rural Broadband Initiative (RBI) programmes.

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451 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraph [645].

452 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 [50].

453 Spark "Submission on UBA and UCLL FPP pricing review determination" CONFIDENTIAL, 20 February 2015, paragraph [198].

454 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, recommendation 8.

1027. In relation to UFB and RBI, the first questions we must answer are, do we assume the hypothetical efficient operator receives this funding, and if so, what bearing has this had on the deployment and capital costs of the UBA network footprint.

1028. Consistent with our treatment of capital funding in UCLL context, we consider the hypothetical efficient operator obtains the same level of capital funding as Chorus (to the extent it applies to the provision of the regulated service). To our knowledge, the UFB funding has not benefited the UBA network we are modelling. Therefore, this funding is not a relevant consideration for our hypothetical efficient operator.

1029. Accordingly, in the context of UBA, the relevant funding that the hypothetical efficient operator would receive is the same level of funding Chorus received through the RBI programme.

1030. While we do not fully support Spark's view that RBI funding should be excluded from the modelled costs for the UBA network we do believe that some account has to be made for RBI funding in the UBA model. As discussed above, this funding has been provided by the Government to Chorus to improve and extend its rural copper-based UBA network. Our modelled UBA network footprint is based on Chorus' current UBA connections, and there are connections within this footprint that would not exist were it not for the RBI funding.

1031. As stated in our UCLL draft determination,[455] we consider that the Act demonstrates a general intention that Chorus should not over recover its costs[456] and we consider that this principle also applies in respect of the UBA service.

1032. However, we are mindful of the impact that would occur if we deducted, in full, the RBI subsidy from the TSLRIC of UBA. Doing so would in effect negate the government subsidy, clawing it back from Chorus.

1033. Similarly, it would also be extraordinary if Chorus' participation in the RBI resulted in an increase in the cost of the service for other end-users. Thus, any increase in the TSLRIC of the UBA network resulting from Chorus receiving the RBI subsidy should be removed.

1034. We are aware that much of the RBI subsidy received by Chorus was applied to upgrading the network to be capable of offering broadband to end-users by providing fibre optic feeders to the cabinets (or to the sites of new cabinets). Since the cost of the trench over these routes is already included in our TSLRIC model, this upgrade has had no (or very low) impact on the TSLRIC cost of the UBA network.

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455 Commerce Commission, "Further draft pricing review determination for Chorus' unbundled copper local loop service", 2 July 2015, Attachment K para [30]

456 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]**

1035. Accordingly, and as set out in our December 2014 UBA draft determination paper, we consider it is appropriate not to deduct the full amount of the subsidy from the TSLRIC. Rather, we have identified the network elements in the UBA network which are present because of the RBI subsidy. These are the upgrades to active cabinets and the DSLAMs.

Attachment L: Modelling basis for taxation

Purpose

1036. In this Attachment we set out how we have treated tax in our model for the UBA service.

Our further draft decision

1037. Our further draft decision remains 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.[457]

1038. 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.[458]

1039. We consider that this is consistent with our framework for carrying out the pricing review.

1040. We note that the assets used to provide the UBA service are often different to those used to provide UCLL, however we do not consider that this warrants a change in our approach to depreciation. We consider that the same approach to taxation for UBA and UCLL is appropriate, as taxation applies to the hypothetical efficient operator as whole, and not a service level.

1041. Please refer to Attachment L of the UCLL July 2015 further draft determination for a summary of our approach, our reasons and a detailed analysis of the issues around our treatment of tax.

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457 Commerce Commission "Regulatory framework and modelling approach" (draft determination, 9 July 2014) paragraphs [253-258].

458 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.

Attachment M: Operating expenditure

Purpose

1042. The purpose of this Attachment is to outline our further draft decisions regarding how we treat network operating expenditure (opex) in our TSLRIC model for the UBA service.

1043. 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.[459]

Our further draft decisions

1044. Our further draft decisions in respect of opex for the UBA service is that our starting point is to use Chorus' financial accounts to determine opex in our TSLRIC model.

1045. For a detailed discussion of our reasons and our analysis of the issues in respect of the use of Chorus' opex as a starting point please refer to Attachment M – Opex of our July 2015 UCLL further draft determination. As we are applying a similar conceptual economic framework to determine a TSLRIC price for the UBA service as we have used for the UCLL service, we consider that the principles regarding opex discussed in Attachment M of the July 2015 UCLL further draft determination are also relevant for the UBA service, subject to the following paragraphs.

1046. In Attachment M - Opex of our July 2015 UCLL further draft determination we discuss a 40% adjustment to opex for a fibre access network. This opex adjustment has not been applied in respect of the opex related to the UBA core network, as our modelled opex are derived from Chorus' FTTN network, which is likely to have a similar level of opex as a new network.

1047. We note that in Attachment M – Opex of our July 2015 UCLL further draft determination we also discuss an adjustment based on line fault indices (LFI adjustment), as a proxy for the likely higher fault rates of our hypothetical efficient operator's FTTH/FWA UCLL network, which has a larger proportion of aerial deployment relative to Chorus' copper network. This LFI adjustment has not been applied in respect of the opex related to the UBA network, as aerial deployment is not a relevant consideration in respect of the UBA assets.

1048. 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

[459] 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].

therefore not been included in this Attachment. We have reviewed this document and we agree with TERA's proposed responses to the submissions made. [460]

[460] 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.

Attachment N: Cost allocation

Purpose

1049. The purpose of this Attachment is to outline our further draft decisions in regards to the allocation of forward-looking common costs in our TSLRIC model for the UBA service. We discuss our earlier views in respect of the treatment of common cost allocation, views of submitters, and our subsequent analysis and further draft decisions.

Our further draft decisions

1050. Our further draft decisions in regards to how we allocate forward-looking common costs in our TSLRIC model for the UBA service are:

1050.1 For network costs, we use a capacity-based allocation approach, which is implemented:

1050.1.1 for active assets, by using specific allocation keys identified for different categories of network costs;

1050.1.2 for the cost of the fibre link between the cabinet and the exchange, by allocating 100% of the cost to the bitstream services, so as to avoid double counting where costs have already been allocated to fibre leased lines;

1050.1.3 for the cost of the fibre link between the exchange and the FDS, by using the method of equi-proportional mark-up (EPMU) that is modified to be based on revenue-shares (which we refer to in this draft determination as “modified EPMU”), as we do not have appropriate data to undertake a capacity-based allocation approach; and

1050.2 For non-network costs, we use the method of EPMU.

1050.2.1 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 do not have appropriate data to undertake a standard EPMU approach.

1050.2.2 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

1051. In our July 2014 regulatory framework and modelling approach paper we distinguished between:[461]

1051.1 costs directly attributable, which are those costs that can be wholly or solely associated with a single type of service; and

1051.2 costs not directly attributable, which are all other costs, ie, those that cannot be wholly or solely associated with a single type of service.

1052. In this Attachment we address costs that are not directly attributable.

1053. In our December 2014 UBA draft determination paper we defined two cost categories within which we would consider how to allocate costs not directly attributable: network costs and non-network costs.[462] We also clarified our definition of these two cost categories.

1053.1 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 UBA 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.

1053.2 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 UBA draft determination paper, we will refer to these costs in this Attachment as "non-network costs".

Allocating network costs

Our choice of allocation approach

1054. In our July 2014 regulatory framework and modelling approach paper and December 2014 UBA draft determination paper we discussed the choice of either a Shapley-

[461] Commerce Commission "Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services" 9 July 2014, paragraph [270].

[462] Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [676].

Shubik approach or capacity-based approach to allocate network costs. [463,464] Our draft decision in our December 2014 UBA draft determination paper was to use a capacity-based approach, for the reasons set out below.

1054.1 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 UBA draft determination paper of giving greater weight to predictability of approach.

1054.2 A capacity-based allocation is a more transparent approach than the alternative Shapley-Shubik approach.

1054.3 Our expert advisor TERA supported the use of the capacity-based approach, noting 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.[465]

1054.4 We also found it persuasive that all of the submitters agreed that we should implement a capacity-based allocation approach.

1055. In submissions and cross submissions on our December 2014 UBA draft determination paper, Chorus continued to support the use of a capacity-based approach rather than a Shapley-Shubik approach.[466] There were no further submissions on the choice of approach, and indeed it appears that this is not a particularly contentious issue.

1056. 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. [467]

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463 Commerce Commission “Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services” 9 July 2014, paragraph [279].

464 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [677].

465 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.

466 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].

467 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].

Implementation of the capacity-based allocation approach for active assets

1057. In the December 2014 UBA draft determination paper we set out our approach to implementing the capacity-based allocation approach for active assets, which was to determine a capacity-based allocation key for different categories of network costs.[468] Our proposed approach was to use the number of customers as the allocation key for active assets of the core network, and the number of ports as the allocation key for FDS costs.

1058. We did not receive any submissions on this particular issue.[469]

1059. 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.[470] We consider that the capacity-based allocation keys determined by TERA are reasonable and provide a valid basis for allocating network costs for active assets. Consistent with our regulatory framework, we consider that the determination of appropriate allocation keys is largely an evidential matter, and we consider that the allocation keys implemented by TERA provide the best objective way of allocating network costs for active assets.

Implementation of the capacity-based allocation approach for passive assets

1060. In our December 2014 UBA draft determination paper, our proposed approach to allocating network costs for passive assets (in particular, the cost of the fibre links between the cabinets and the exchanges, and between the exchanges and the FDS) was as follows:[471]

    1060.1 Between the active cabinets and their parent exchange, allocate costs as 2/3 to the bitstream services (these include the regulated bitstream service and the non-regulated bitstream service) and 1/3 to other services.

    1060.2 Between exchanges and the FDS, allocate costs as 1/3 to the bitstream services and 2/3 to the other services.

1061. Our rationale for this approach was that we lacked definitive data with which to undertake a capacity-based allocation approach. TERA had advised that this was a reasonable approach to cost allocation given the lack of data. We also noted in our December 2014 UBA draft determination paper that we could have used modified

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468 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraphs [684-686].

469 We did receive one submission from WIK on the technical implementation of this approach in the Excel spreadsheets underlying the TSLRIC model (see 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, footnote [107]). We have discussed this submission with TERA, and we agree with TERA's proposed responses to this submission.

470 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].

471 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [689].

EPMU as an alternative approach, but it was not clear at that stage whether we had sufficient data to undertake that approach.

1062. In submissions on this issue, Chorus submitted that allocation based on modified EPMU would be preferable in this case where we lack sufficient data, as it would give a better and more realistic allocation of cost based on known cost drivers.[472]

1063. In its cross submission, Chorus used the exchange at Palmerston North as a case study to show that the primary contributor to peak hour traffic is the UBA service.[473] Chorus considered that this was consistent with applying a modified EPMU approach based on revenue. We note that Network Strategies, in its response to various issues raised at the conference, queried the representativeness of Palmerston North as a suitable case study.[474] We consider that it is arguable whether Palmerston North is a representative case study, although we have not analysed the issue of the representativeness in any more detail, as it is not a material consideration in regards to our draft decision discussed below.

1064. Other submitters also queried the allocation approach for passive assets. WIK submitted in respect of the cost allocation between the cabinet and the exchange that the 2/3 and 1/3 allocation (which was based on two fibres being used for backhaul to the FDS and one for leased lines or dark fibre) was incorrect.[475] WIK suggested instead that only one fibre would be required for backhaul to the FDS.

1065. WIK also submitted in respect of the cost allocation between the exchange and FDS that (which was based on the cost being shared between three services: 1/3 to bitstream and 2/3 to voice and leased lines) that no costs should be allocated to the voice service, because it is integrated into bitstream and has only a minor share.[476] WIK recommended that costs be allocated using fibre counts, and based on fibre counts of two fibres per cabinet for leased lines and dark fibre, and one fibre for UBA, WIK recommended an allocation of costs between the exchange and the FDS of 1/3 to bitstream and 2/3 to the leased line service.[477]

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472 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].

473 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 [237].

474 Network Strategies “UCLL & UBA Conference Issues” 19 May 2015, p. 1.

475 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 [394].

476 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 [398].

477 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 [399].

1066. In cross submissions, Analysys Mason agreed with WIK that network costs for passive assets between the exchange and the FDS should not be allocated to voice.[478] However, Analysys Mason disagreed with WIK's proposed allocation approach based on fibre counts, and considered that allocation by either traffic or revenue was a "more natural" approach.[479] We note also that the cost model provided by Analysys Mason allocated these costs based on traffic.

1067. Based on the views of submitters, we have reconsidered our view in regards to the allocation of costs for passive network assets. For the allocation of costs between the exchange and the FDS, TERA has recommended a modified EPMU approach (ie, allocation in proportion to revenue-shares). We agree with this recommendation, and we have sufficient data to implement this approach.

1068. We note that the approach proposed in our December 2014 UBA draft determination paper (based on the share across services for the allocation between the exchange and the FDS) was considered to be a reasonable approach in the absence of definitive data to implement a capacity-based approach. However, we now consider that:

1068.1 modified EPMU is a more robust approach in the absence of definitive data for a capacity-based approach, as it is based on specific revenue-based data; and

1068.2 the use of modified EPMU in the absence of definitive data is consistent with the cost allocation approaches we have used elsewhere in our model where we were also faced with a lack of data to implement our preferred approach (as discussed later in this section in respect of non-network cost allocation).

1069. We also note that, based on recommendations from TERA, we consider modified EPMU to be preferable to an allocation based on traffic, as the latter is unlikely to be an appropriate cost driver. We also note that, despite Chorus' expert Analysys Mason using traffic to allocate network costs for passive assets in its own cost model, Chorus itself has suggested using a modified EPMU approach. As noted above, Analysys Mason's cross submission also suggests that either traffic or EPMU based on revenue are possible approaches, and at the conference Analysys Mason stated that the choice between these two is "arbitrary".[480]

1070. For the allocation of costs between the cabinet and the exchange, TERA continue to recommend that there is suitable data to base an allocation on fibre counts, and we agree with this recommendation. This approach would allocate the cost of the fibre link from the cabinet and the exchange between the bitstream services and fibre leased lines services.

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478 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross-submission" CONFIDENTIAL, 20 March 2015, section [3.10].

479 Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination cross-submission" CONFIDENTIAL, 20 March 2015, section [3.10].

480 Commerce Commission "UBA and UCLL pricing review determination conference transcript" 15-17 April 2015, p.411.

1071. We note, however, that our TSLRIC model already captures a share of costs that are allocated to fibre leased lines.[481] Therefore to also allocate costs to fibre leased lines through our cost allocation approach would amount to double counting. Accordingly, in our TSLRIC model we have allocated 100% of the cost of the fibre link between the cabinet and the exchange to the bitstream services.

Allocating non-network costs

Our choice of allocation approach

1072. In our December 2014 UBA 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 UBA 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.[482]

1073. In further submissions on our December 2014 UBA draft determination paper, WIK re-iterated its support for the EPMU approach.[483] We did not receive any further submissions on the choice of EPMU, and indeed it appears that this is not a particularly contentious issue.

1074. 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. [484]

Implementation of the EPMU allocation approach

1075. In our December 2014 UBA draft determination paper we noted that EPMU is typically implemented using accounting cost data from the regulated firm's accounts.[485] However, based on our review of Chorus' financial accounts, we noted that a breakdown of costs by service was not necessarily always available.

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481 As discussed in TERA's Model Specification Paper – TERA Consultants "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services – Model Specification" June 2015, section [3.11].

482 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraphs [698]-[701].

483 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].

484 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].

485 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [702].

1076. 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 UBA draft determination we allocated a share of non-network common costs to each service in proportion to that service's share of revenue. As noted above, in this draft determination, we refer to this proxy approach as modified EPMU. We applied the modified EPMU approach to allocate costs between the regulated (UCLL and UBA) and non-regulated (co-location and ancillary charges) services.

1077. 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 EMPU. In this case, in our December 2014 UBA draft determination we allocated a share of non-network common costs within the UCLL and UBA services in proportion to each service's share of opex.

1078. 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.[486]

1079. However, Analysys Mason's submission highlighted two critiques with this approach.[487]

1079.1 The approach used in our December 2014 UBA 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.

1079.2 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 UBA 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.[488, 489]

1080. In cross submissions, Vodafone disagreed with Analysys Mason regarding the inconsistency in applying modified EPMU in one case and EPMU in another.[490]

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[486] Analysys Mason "Report for Chorus - UCLL and UBA FPP draft determination submission" CONFIDENTIAL, 20 February 2015, p. 43.

[487] Ibid.

[488] InternetNZ, Consumer and TUANZ "Submission on draft UCLL and UBA price review determinations" 20 February 2015, paragraph [33].

[489] 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].

[490] 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

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.

1081. 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 allocation within the UCLL and UBA services).

1082. As noted in the December 2014 UBA draft determination paper, in the absence of data we consider that the modified EPMU approach is the best available proxy. [491] 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.

1083. 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 traditional 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.

1084. 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

1085. In our December 2014 UBA draft determination paper we identified the potential for double recovery arising from the use of different MEAs for UCLL and UBA.[492] 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.

Bitstream Access services (excluding TSO Boundary considerations)" CONFIDENTIAL, 20 March 2015, paragraph [E3.2].

491 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [705].

492 Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream access service" 2 December 2014, paragraph [710].

1086. In our December 2014 UBA draft determination paper we set out our proposed approach to addressing this double recovery, which is as follows:

1086.1 Calculate the potential double recovery as a result of the trench shared between UBA and UCLL.

1086.2 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.[493]

1086.3 UBA TSLRIC costs should be reduced by the UCLL share to avoid potential double recovery.

1087. 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.

[493] We used cable surface or duct surface when there are dedicated ducts to allocate the costs of.

Attachment O: Alternative methods to set prices for UBA and EUBA

Purpose

1088. The purpose of this Attachment is to explain the alternative ways to set prices for the four different variants of the UBA service specified in the UBA STD (the UBA variants).

1089. As discussed in Chapter 3, in our December 2014 UBA draft determination paper we set out some different ways we could set prices for UBA variants.[494] One of these approaches was to set the same price across the different variants, which we discussed in Chapter 3 and concluded that we do not consider this to be an appropriate approach. We therefore do not discuss this approach any further in this Attachment.

1090. The other approaches for determining differential prices were to:

1090.1 determine a price differential based on a price consisting of two components ie, the price per customer plus a uniform price per Mbps; or

1090.2 determine price differentials based on a gradient approach, whereby the difference between the prices for the variants is based on an appropriate gradient, in a way such that the average revenue from these products equals the average TSLRIC cost.

We describe these two approaches in more detail (including different variations of the gradient approach) in this Attachment.

Determining a price based on two components

1091. Under this approach, the price would consist of one price made of two components:

1091.1 a uniform price per customer; and

1091.2 a uniform price per Mbps at peak hour.

1092. This approach implies that for each operator, traffic at peak hour would be measured and if an operator has, for example, 100 customers generating a total of 30 Mbps (300kbps per customer), then the operator will pay 100 multiplied by the uniform price per customer, plus, 30 multiplied by the uniform price per Mbps.

1093. This second approach is used internationally in some countries, including France, Ireland and Italy.

1094. However, this approach has two main drawbacks.

1094.1 A distinguishing feature of the EUBA variants is guaranteed throughput for real time applications, and therefore traffic at peak hour is not a cost driver.

[494] Commerce Commission "Draft pricing review determination for Chorus' unbundled bitstream service" 2 December 2014, paragraphs [338]-[364].

1094.2 To calculate the uniform price per Mbps, it is necessary to make traffic forecasts and these are very difficult to make, especially over a five-year regulatory period. Alternatively, in the absence of traffic forecasts, it is necessary to adjust the price every year. In both cases, this pricing approach is volatile.

Determining a price based on the gradient approach

1095. This approach uses gradients to determine price differentials for UBA variants. In other words, we would set BUBA and EUBA40, EUBA90 and EBUA180 prices so that the average revenue from these products equals the average TSLRIC cost, and the difference between the prices for the variants is calculated based on an appropriate gradient.

1096. The gradient aims to reflect customers' relative willingness to pay for the different variants. Prices remain cost oriented because total revenues for UBA equal the TSLRIC costs. However, price differences do not reflect specific cost differences.

1097. We have considered the following options for the appropriate gradient:

1097.1 Gradient based on guaranteed throughput;

1097.2 Gradient based on throughput at peak hour;

1097.3 Gradient based on retail-minus ratios that applied before 1 December 2014; and

1097.4 Gradient in place from 1 December 2014 from the UBA IPP determination, based on international benchmarking.

1098. We provide further detail on each of the options below.

Gradient based on guaranteed throughput

1099. This option uses the guaranteed throughput for each of the regulated UBA variants:

1099.1 32kbps for BUBA;

1099.2 32kbps plus 40 kbps for EUBA40;

1099.3 32kbps plus 90 kbps for EUBA90; and

1099.4 32kbps plus 180 kbps for EUBA180.

1100. This means that the EUBA40 price will be 72/32 times higher than the BUBA price, the EUBA90 price 122/72 times higher than the EUBA40 price, and the EUBA180 price 212/122 times higher than the EUBA90 price.

1101. A major issue with this approach is that a gradient based on throughput does not reflect customers' willingness to pay. Willingness to pay might be quite different compared to, for example, a relationship based on the guaranteed throughput of

EUBA40 being 72/32 times higher than BUBA. Accordingly, this relationship may not be appropriate to reflect in STD prices.

Gradient based on throughput at peak hour

1102. The throughputs quoted above are guaranteed throughputs but they do not reflect actual throughputs experienced at peak usage. Even if peak hour throughput is not a cost driver for UBA in New Zealand, we are advised by TERA that it is a cost driver in other countries. We agree with TERA. As a consequence, throughputs at peak usage could be used to calculate the gradient.

1103. However, this approach has the following disadvantages:

1103.1 It requires knowing average peak traffic for each bitstream offer (UBA variant), which is not available; and

1103.2 Average peak traffic changes quickly so prices could become out of date.

Gradient based on retail-minus ratios

1104. This option uses historic ratios established under the former retail-minus approach. The retail-minus ratios were established by reference to retail services in the United Kingdom.

1105. Given that we are undertaking a pricing review determination of prices set using the IPP of international benchmarking, we consider it would be undesirable to revert to ratios set under the previous pricing principle of retail-minus.

Gradient based on price differentials in place the IPP determination is appropriate

1106. This option uses price differentials in place from 1 December 2014 from the IPP determination, which are based on international benchmarking against Belgium, which has a wholesale bitstream service with a real time CoS profile.

1107. As discussed in more detail in Chapter 3, we consider that this gradient is the best approach to set prices for the UBA variants.

Attachment P: Backdating

Purpose and overview of this Attachment

1108. 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.

1109. We are also providing our proposed backdating model to help interested parties understand how backdating could apply to them and to replicate our results, if we were to decide to backdate. We invite submissions on our proposed backdating model. In particular, we invite parties to:

1109.1 comment on the appropriateness of the proposed model;

1109.2 calculate their own backdating amounts, and corresponding lump sum payments; and

1109.3 calculate an aggregate backdating amount and associated claw-back to the final price.

How are the backdating amounts likely to be calculated?

1110. Please refer to Attachment P of the UCLL further draft determination for an explanation of how we have estimated the backdating amounts applicable to UBA and UCLL.

Attachment Q: International comparators

1111. The international comparator evidence presented by Spark relates to the UCLL charges and we discuss this more thoroughly in Attachment Q of our July 2015 UCLL further draft determination. The UCLL component together with the additional costs of UBA comprises the total UBA charges. With respect to the additional costs of UBA we note that the levelised price for UBA of $10.84 is very close to the UBA IPP determined price of $10.92; which in turn was based on a full examination of international comparators.

Attachment R: Analysis of submissions on uplift

Purpose

1112. In this Attachment, we set out our current view on the need for any changes to our analytical framework for considering the potential welfare effects of an uplift to the TSLRIC price.[495]

Our draft decision

1113. Having reviewed and considered submissions on the analytical framework we proposed in our 2 April 2015 paper, we have made a number of amendments as discussed in Attachment R of the UCLL FPP further draft determination.

[495] We consulted in our proposed analytical framework in April 2015. See Commerce Commission "Agenda and topics for the conference on the UCLL and UBA pricing reviews" 2 April 2015.

Attachment S: Review of Chorus model

Purpose

1114. In this Attachment we set out our current view on Chorus' cost model.

Analysis

1115. 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.

1116. 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).

1117. 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 UBA services in New Zealand.

1118. Please refer to Attachment S of the UCLL further draft determination for our detailed analysis of the issues relating to our review of Chorus cost model.

1119. Our review in Attachment S of the UCLL further draft determination is a review of all of Chorus' cost model – both the UCLL and the UBA part.