NETWORK STRATEGIES
• Telecommunications Strategy •

Cross-submission on UCLL and UBA TSLRIC further consultation paper

Final report for Vodafone, 30 April 2014

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Contents

0 Executive summary

The legal framework in New Zealand requires the use of forward-looking costs in the estimation of a TSLRIC price for UCLL and UBA services. This requirement will be met by the implementation of a cost model of a hypothetical efficient network, identifying the lowest cost modern technology (or technologies) delivering similar service potential as the regulated services.

A defining characteristic of the telecoms industry is the rapid pace of technological change, delivering new service features and solutions, together with commercial propositions that have evolved from those associated with legacy networks. In costing legacy regulated wholesale services in these circumstances regulators typically adopt a Modern Equivalent Asset (MEA) standard that will capture efficiency gains. Contrary to Chorus' assertions, there is no evidence that regulators insist that the MEA must replicate exactly the full functionality of the legacy network. Regulators typically define the MEA in terms of reflecting the same or similar service potential as existing assets. While there are certainly different nuances in MEA definitions, the common feature is the emphasis on 'lowest cost', not precisely replicating functionality.

Chorus also claims that the Commission must follow a linear progression in its process – first identifying the service and then calculating the LRIC based price for that service. In such a linear process, Chorus seeks to use the service definition to restrict the options available for certain assumptions (such as MEA), as well as imposing limitations on the specification of a hypothetical network in order that this network replicates the exact functionality of Chorus' actual network. Such a process departs from the required 'forward looking cost' principles and may deliver costing results which diverge significantly from those of an efficient operator. In practice the examination of MEA may cause a regulator to review the service definition in the light of newer technology. A more realistic process would incorporate some type of feedback loop that takes into account the market situation.

The most recent relevant European Commission recommendation is that the hypothetical efficient NGA network should be selected according to the access technology and network topology that best fits national circumstances. In this regard we find no evidence that supports Chorus' blanket statement that international precedent is to model the copper

network. Furthermore, the reality in New Zealand is that fibre is now a significant part of Chorus' network.

Consistent with the European Commission's recommendation, the approaches adopted in Sweden and Denmark are tailored to the specific conditions that prevail in these countries. The Swedish model provides a particularly relevant precedent for the Commission, showing that it is feasible for a single LRIC model to accommodate multiple MEAs to derive costs for unbundled local loop and bitstream (both copper and fibre). This model uses fibre and radio as MEA for copper, and so the MEA assumptions are consistent for both services. This approach facilitates lowest cost technology choice, and is entirely consistent with the practices of an efficient operator deploying a network in current market conditions.

1 Introduction

Vodafone New Zealand has requested that we examine a number of issues in Chorus' recent submission[1] on the Commerce Commission's March 2014 Consultation Papers in relation to the Final Pricing Principle for Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream Access (UBA) services[2].

In particular this cross-submission addresses:

- international experience in regard to selection of the Modern Equivalent Asset (MEA) (Section 2)
- the 'two step process' (Section 3)
- UCLL and SLU MEA, with a focus on international experience (Section 4)
- sharing a single cost model for UCLL and UBA (Section 5)

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1 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014.

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

- other inferences based on international experience (Section 6)
- performance adjustments (Section 7).

Finally, our concluding remarks are in Section 8.

Although Vodafone commissioned this report the views expressed here are entirely those of Network Strategies Limited.

2 MEAs: international experience

Chorus characterises the Modern Equivalent Asset as 'a tool used in determining the TSLRIC price'[3] and summarises different regulatory definitions of the MEA concept, including:

- Ofcom's 'lowest cost asset which serves the same function as the asset being valued' (1996)
- the International Regulator Group's (IRG) 'lowest cost asset, providing at least equivalent functionality and output as the asset being valued' (2000)
- the Danish regulator's 'an asset that can produce the stream of services produced by the existing asset at lowest cost' (2008).

Chorus concludes that these definitions imply that the MEA concept does not allow for any departures from the functionality of the regulated service.

In fact the common feature of all of the above quotations is the emphasis on 'lowest cost', rather than consistent statements about functionality. Further investigation of the source documents reveals other statements relevant to functionality. For example, in the IRG

3 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014. *See paragraph 62.*

statement the MEA is defined (as a recommended principle) as having 'the same service potential'[4], and adjustments are recommended for differing functionality.

> The MEA valuation of an asset should be adjusted to take account of differences in operating costs, asset lives, output and functionality between the MEA asset and the existing asset.[5]

Likewise the Danish statement indicates that 'in cases where the cheapest replacement provides additional functionality or capacity, this should still be the basis for the MEA' with adjustments to allow for either the existing asset or MEA being superior[6].

Note that the association of the MEA construct with the same or similar 'service potential' of the existing asset has for many years been widely accepted by regulatory authorities from diverse sectors. For example:

- for a bottom-up model of the long run efficient cost of providing services on the Australian fixed network from 2007-2012 the ACCC defined the MEA as the 'lowest cost asset with the latest available and proven technology to provide the same service potential'.[7]

- the Swedish telecoms regulator (PTS) in its draft model reference paper for LRIC models noted that when there has been technological change, the replacement cost is based on a MEA with similar service potential[8].

- In regulating the Scottish water industry the depreciated optimised replacement cost (net cost of replacing an existing asset) was based on 'similar service potential'[9].

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4 Independent Regulator's Group (2000), *Principles of implementation and best practice regarding FL-LRIC cost modelling*, 24 November 2000. See PIB Xi, page 6.

5 *Ibid,* PIB XII.

6 National IT and Telecom Agency (2008), *Model Reference Paper*, 18 September 2008. See page 44.

7 Australian Competition and Consumer Commission (2008), *Analysys cost model for Australian fixed network services*, December 2008.

8 PTS (2010) *Draft Model Reference Paper (rev c) – Guidelines for the LRIC bottom-up and top-down models*, 4 February 2010.

Accordingly many regulated entities, such as BT, explicitly state that existing assets may not be replaced in an identical form owing to technological change. In these circumstances MEA has been defined as 'a modern asset with similar service potential'[10].

Another point to note is that the use of the MEA principle may not have exactly the same implications in bottom-up modelling as top-down LRIC modelling. In top-down modelling there is substantial reliance on the accounting information of the regulated entity with current cost accounting asset revaluation which may include the substitution of MEA-based prices for existing network assets to reflect technological change. With a bottom-up approach a model is developed which reflects assumptions with respect to MEA technologies with a much lower reliance on the actual network technology and design. This implies a greater degree of flexibility in MEA implementation than the top-down approach, and accordingly is likely to deliver results that more accurately reflect efficient forward-looking costs.

3 The two step process

Chorus states that the determination of the final prices follows a two step process:

> The Commission should take care not to confuse the first step in the Act (identifying the service to be modelled) with the second step (calculating the TSLRIC price of the service). Questions around the MEA and network optimisation are (and can be) addressed at the second step, even if the Commission is required to model the service defined in the STD. For example, under a scorched node approach, the Commission can still identify the most efficient path between the node and customer premises.
>
> This would also be consistent with past practice in other jurisdictions, such as Australia, the United States and a number of European jurisdictions, where the starting point has been an

9 Water Industry Commission for Scotland (2004) *Our work in regulating the Scottish water industry: The calculation of prices,* September 2004.

10 BT (2013), *Current cost accounting: Detailed valuation methodology,* 31 July 2013. See page 5.

> objective of costing the regulated service, and the changes in technology and network design in the model have been incremental rather than sweeping.[11]

It is notable that the second paragraph in the quoted text above has overlooked the very different circumstances around cost-based pricing in other jurisdictions compared with those in New Zealand. In Australia and the United States, as well as for many European jurisdictions, cost modelling has been used to set regulated prices for many years. For example:

- **Australia** – regulated prices for the unbundled local loop service (ULLS) have been based on the results of cost models for more than ten years.[12]

- **Sweden** – a LRIC model for unbundled local loops was first used in 2003, which replaced earlier cost models.[13]

It is hardly surprising that over this long history of cost modelling changes in technology and network design have occurred, resulting in incremental changes to the models over time. In other words, the models have evolved as the networks and markets evolve.

By contrast, this is the very first time in New Zealand that a cost model will be used to set UCLL and UBA prices, and so there is no historical precedent in New Zealand that can be utilised as leverage to build incremental enhancements.

Chorus is claiming that the two steps within the process – identifying the service and calculating the LRIC based price for that service – form a linear progression. In such a linear process, Chorus seeks to use the service definition to restrict the options available for certain assumptions (such as MEA), as well as imposing limitations on the specification of a hypothetical network in order that this network replicates the exact functionality of

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11 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014, paragraphs 12-13.

12 Australian Competition and Consumer Commission (2002), *Pricing of unconditioned local loop services (ULLS)*, final report, March 2002.

13 PTS (2003), *LRIC: the final hybrid model,*19 December 2003.

Chorus' actual network. Such a process departs from the required 'forward looking cost' principles and may deliver costing results which diverge significantly from those of an efficient operator.

A strict linear process is not necessarily the case in practice, as the examination of MEA may cause a regulator to review the service definition in the light of newer technology. A more realistic process would incorporate some type of feedback loop that takes into account the market situation. In its Common Position on best practice for market 4[14] and market 5[15], BEREC (Body of European Regulators for Electronic Communications) clearly states:

> NRAs [National Regulatory Authorities] should impose the appropriate and proportionate combination of access products that properly reflect their national circumstances. This involves reflecting the actual competitive situation including different architectures (e.g. FTTH/B, FTTC). In doing so NRAs should simultaneously look at access products in markets 4 and 5 and take into account the effects of symmetrical regulation if it has been imposed.[16]

Without question, fibre is rapidly becoming a significant part of Chorus' network. Chorus has announced that as at the end of 2013, just under a quarter (24%) of Chorus' UFB rollout had been completed, with 259 000 end customers within reach of fibre.[17] By the end of Q1 2014 an additional 38 000 end customers were within reach of fibre[18].

What are the implications of a service definition that does not match exactly what an economically efficient wholesale operator would deploy?

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14 Wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location.

15 Wholesale broadband access (including bitstream access).

16 BEREC (2012), *Common position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market*, BoR (12) 127, 7 December 2012.

17 Chorus (2014), *Chorus interim FY14 result – Reshaping the business to be sustainable*, 24 February 2014.

18 Chorus (2014), *UFB rollout ahead as fixed connections increase*, stock exchange announcement, 16 April 2014.

- Costs would be higher, and thus end-users would be paying higher retail prices.
- A barrier to innovation would be introduced, as retail service providers – who in a competitive market would seek to minimise inefficiency – could be constrained in the creation of new products and services.

4 UCLL and SLU MEA

Chorus claims that assuming a copper network is the only way that the Commission can model the full functionality of the UCLL and SLU STD services.[19] Furthermore, Chorus also claims that the costs of an optimised copper network are comparable to those of an optimised fibre network.[20]

Are costs of an optimised copper network comparable to fibre?

In support of its claim, Chorus provides a single example – that of a Danish study conducted for the regulator.

This 2012 study found that:

> … the investment required for a FTTH network would be around 12% higher than the investment in a copper network today. This excludes CPE and active equipment since costs of copper active equipment and CPE can vary significantly depending on the technology chosen (vectoring, pair bonding, etc.). However, the passive part of the copper and FTTH networks should represent the very large part of costs.[21]

However, the study also notes:

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19 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014, paragraph 80.

20 *Ibid*, paragraph 82.

21 TERA Consultants (2013), *Modification and development of the LRAIC model for fixed networks 2012-2014 in Denmark: MEA assessment*, May 2013, Section 2.2.2.

> … the gap between the cost of the copper and FTTH networks will probably narrow in the coming years due to the combination of the steadily decrease of fibre prices and of the increase of copper cost. Indeed, the price trend for fibre is in average -5% whereas for copper it is around 3%.

In a rough analysis based purely on the cost trends from the Danish example, after two years (that is, for a 2014 version of the cost model) fibre will be slightly cheaper than copper and after five years fibre will be 25% lower than the cost of copper (Exhibit 1 – this uses cost indices, with the cost of the copper network being 100 in year 0). We recognise that a full cost study would be far more complex than this very simplistic approach, however the example does illustrate how quickly these relatively modest price trends can translate into significant cost differences.

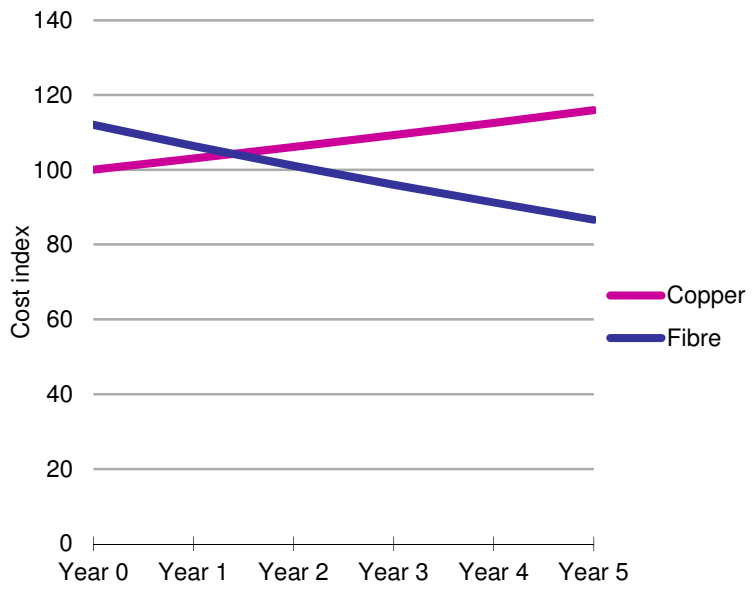

Exhibit 1: *Extrapolation of cost trends from the Danish example [Source: Network Strategies]*

In 2011 the Swedish regulator, PTS, estimated that the cost of deploying copper was similar to, or slightly higher than, the cost of deploying fibre.[22] If cost trends similar to

22 European Commission (2011) *Commission decision concerning case SE/2011/1205: Further details of price control remedies – review of the LRIC model*, 12 May 2011.

those in Denmark also applied to Sweden, then by 2014 fibre costs could well be significantly lower than those of copper.

It should be emphasised that the results of these types of cost study will be influenced by local factors – conclusions appropriate for one country may not necessarily apply to the situation in New Zealand.

Is copper the only solution?

In support of its claim, Chorus quotes from the PTS Model Reference Document[23] in English, yet the stated source is in Swedish. We have been unable to locate either an official English translation, or an unofficial translation released by PTS. We therefore assume this is Chorus' own translation. Consequently we cannot be confident that the passage quoted by Chorus is a true and accurate representation of the original text.

However in general terms, PTS requires that if fibre or radio is used as MEA, then the costs must include any equipment necessary for the end-customer's analogue equipment to be used. This would exclude any equipment that would not be paid for by the access provider.

Chorus then makes an unsubstantiated claim that this requirement will "drive unnecessary cost and complexity and could present risks to timetabling aims".

It will clearly increase the cost of the network, but without a proper cost comparison it is impossible to state whether the resultant costs would be higher than those of a copper network.

In the Swedish LRIC model[24] fixed wireless access (FWA) technology is used in areas where it is cheaper than deploying fibre. The costs of wireless equipment at the customer site (excluding any costs borne by the customer) are included as a small number of line items, which does not appreciably increase model complexity at all. The model determines

23 PTS (2012), *Utkast till modellreferensdokument (MRD rev d) Riktlinjer för framtagandet av LRIC- bottom up och top down-modeller*, 17 April 2012, Section 12.3.2.

24 This refers to version 10.1, however this same functionality was also present in previous versions.

the optimal costs by examining the costs for each area ("tätort") across the country based on:

- no FWA – that is, fibre access
- FWA for the entire area
- FWA outside the urban area.

In other words, the model is not restricted to a single MEA technology, but takes into account the variation in environmental characteristics in its assessment of an appropriate MEA, and selects the lowest cost option.

We acknowledge that this optimisation adds some complexity to the model, which of course would be reflected in increased development time. However, without this feature:

- the costs estimated by the model would be higher
- the network would not reflect that of an efficient operator.

With regard to fibre, the model assumes that a dedicated fibre pair is provided to each premises, however PTS notes that the actual network is a mix of copper pairs, dedicated fibre (FTTH) and shared fibre (FTTB – typically used for apartment buildings).[25] Unbundled local loop results from the model are based on fibre, however it appears that there are separate prices for subloops corresponding to different network configurations.

In essence, the Swedish model provides a precedent for the Commission, showing that it is indeed feasible for a LRIC model to encapsulate multiple MEAs, which is entirely consistent with how an efficient operator would deploy a network. The Commission also has previously used an approach similar to the Swedish "tätort" cost optimisation methodology in estimating efficient costs for delivery of the Telecommunications Service Obligation (TSO) to Commercially Non Viable Customers (CNVCs) in rural and remote areas in New Zealand. For the early TSO Determinations the Commission sought the lowest cost technology for TSO services through examination of the costs of various modern wireless systems as they became commercially mature. For example, in the

25 PTS (2013), *Dokumentation av hybridmodell v.10.1*, 16 December 2013.

2002/03 Final Determination[26] the Commission identified modern efficient Wireless Local Loop (WLL) technology as suitable for the delivery of TSO services and enabled its use in the TSO bottom-up cost model for regions with appropriate terrain.

As regards the Commission's current cost modelling exercise, without knowing in more detail the arrangement between the Commission and its consultant, it is not possible for us to state whether or not the resources assigned could achieve a model with appropriate functionality (with respect to including multiple MEAs such as fibre and radio) within the required timeframe.

Nonetheless, bypassing the obligations of the final pricing principle purely for reasons of convenience is not an option for the Commission. If we return to the core principles of LRIC modelling:

> The MEA is the lowest cost asset, providing at least equivalent functionality and output as the asset being valued. The MEA will generally incorporate the latest available and proven technology, and will therefore be the asset that a new entrant might be expected to employ.[27]

As we have demonstrated, the Swedish approach implements exactly these principles by identifying for UCLL services the lowest cost technology with similar service potential. The same principles must apply to the UBA service, and indeed this is the case in Sweden (as discussed further in Section 5).

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

27 Independent Regulators Group (2000), *Principles of implementation and best practice regarding FL-LRIC cost modelling*, 24 November 2000.

5 UCLL and UBA: sharing a single cost model

Chorus' view is that the UCLL/SLU and UBA services should be modelled separately, as it believes that the UBA MEA should assume Chorus' copper network.[28] The alternative is that a combined model be used, where the UBA service is an add-on to the UCLL MEA.

In the case of Sweden, a single LRIC model is used to derive costs for unbundled local loop and bitstream (both copper and fibre). As noted previously, this model uses fibre and radio as MEA for copper, and so the MEA assumptions are consistent for both services. Indeed, PTS stated:

> The total annualised cost of the actual local loop should be the same whether it is used for providing basic voice telephony services, purely broadband services, broadband access separated from basic voice telephony access, or basic voice telephony services coupled with bitstream access. [29]

This reflects the strategy of an efficient operator and as such complies with the final pricing principle. An efficient operator would not deliver a bitstream service on the assumption of an inefficiently deployed UCLL. The outcome from Chorus' suggestion is unlikely to be the least cost solution.

6 Other inferences from international experience

Chorus rejects the Commerce Commission's claim that the European Commission's recommendation on wholesale costing methodologies is a useful starting point for the UCLL pricing review. In particular Chorus claims that the European Commission's objectives are quite different to the Commerce Commission's requirement to identify the forward-looking TSLRIC price for UCLL services. It is true that, compared to New Zealand, the European regulatory and market context has many different features. However

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28 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014, paragraphs 132-137.

29 PTS (2010) *Draft Model Reference Paper (rev c) – Guidelines for the LRIC bottom-up and top-down models*, 4 February 2010.

Chorus does not appear to recognise that a key concern of the European Commission is the inconsistency across Member States in regulatory wholesale costing practices in the markets for wholesale network infrastructure access (market 4) and the wholesale broadband access (market 5), including copper access products[30].

> Similarly, regulatory obligations regarding access pricing imposed under Article 13 of Directive 2002/19/EC in markets 4 and 5 also vary considerably across the Member States of the Union although such variations are not justified by underlying differences in national circumstances. In this respect, the Commission has consistently urged NRAs [National Regulatory Authorities] under its powers pursuant to Article 7 of Directive 2002/21/EC (i) to use appropriate cost-accounting methods and ensure consistent pricing of access products along the same value chain to safeguard the investment ladder principle, (ii) to apply the principles of the relevant cost model consistently to all relevant input data and (iii) to recognise the importance of using the costs of a modern efficient network to set access prices[31].

Amongst other objectives, the European Commission sought to address this inconsistency in order to promote more effective competition. To that end, the European Commission recommends that regulators apply a bottom-up LRIC+ methodology, with safeguards to ensure that there is no cost over-recovery for products based on legacy infrastructures[32].

Chorus notes (in paragraph 108) that BEREC was critical of the European Commission's draft recommendation on costing methodologies for wholesale access. The draft recommendation reads:

> When estimating the cost of wholesale access services that are based entirely on copper, NRAs should adjust the cost calculated for the NGA network to reflect the less performant features of a copper network. For this purpose, the NRAs should consider an FttC network

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30 Evidence on the inconsistent regulatory costing practices in these markets across the European Union is available in BEREC (2013), *BEREC Report Regulatory Accounting in Practice 2013*, September 2013.

31 European Commission (2013), *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. See page 3.

32 *Ibid*, see pages 7 – 9.

> to be the modern efficient NGA network and should estimate the cost difference between an access product based on FttC and an access product based entirely on copper by making the relevant adjustments in the FttC engineering model, e.g. replacing the optical elements with efficiently priced copper elements, where appropriate[33].

Chorus interprets BEREC's response to the draft recommendation as an endorsement of the use of a copper MEA. BEREC's response was:

> Instead of "reverse engineering" the copper network costs from an FTTC architecture, BEREC thinks it would be much more appropriate (and accurate) to calculate these costs directly using a copper model[34].

In fact the whole thrust of BEREC's opinion is that the European Commission should adopt a technologically neutral approach, rather than recommending solely FTTC as a 'one size fits all' standard. BEREC recommended that the European Commission's above draft recommendation be amended as follows:

> When estimating the cost of wholesale access services NRAs [National Regulatory Authorities] should adopt a modelling approach that fulfils the key requirements of a) being future proof (in the sense that the latest NGA technology that is appropriate for the national roll-out scenario is considered); b) is able to deal with the declining volume effect by simultaneously incorporating the demand for both copper and fibre access services; c) be able to calculate copper prices that are consistent with prices that would be calculated for fibre access based services[35].

Accordingly the European Commission did amend the relevant recommendation in the final version of its statement, highlighting the principle of technological neutrality and recommending that regulators 'consider various approaches to modelling the hypothetical efficient NGA network depending on the access technology and network topology that best

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33 European Commission (2012), *Commission recommendation of [XXX] on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment,* 2012. See paragraph 42.

34 BEREC (2013), *Commission draft Recommendation on non-discrimination and costing methodologies*, 26 March 2013. See paragraph 135.

35 *Ibid*, see page 45.

fit national circumstances'[36]. The Commission further suggested in relation to costing wholly copper access services that if engineering adjustments to the modelled NGA network are not feasible regulators could 'obtain the copper cost by modelling an NGA overlay network, where two networks (copper and fibre, either FttH or FttC) share to an extent the same civil infrastructure'[37].

Chorus notes that the approach that has been adopted in Denmark is to model the copper network, based on the European Commission's draft recommendation[38]. Although Chorus provides no citation, we assume it is referring to a draft model reference paper published in May 2013 by the Danish Business Authority (DBA)[39] and an earlier MEA assessment[40] in which a case is presented to demonstrate that FTTH is the MEA of copper. According to these documents the DBA intends to model using LRAIC:

- for the passive part of the access network, the copper technology (including FTTC) and the FTTH technology
- for the active part of the network copper and fibre assets to identify cost differences between technologies[41].

While FTTH is regarded as a MEA for copper, it is considered that the estimation of copper-based regulated product prices requires the development of a LRAIC model for copper to identify cost differences between copper and FTTH, owing to local circumstances. In particular, the DBA notes that the regulated operator (TDC) in Denmark

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36 European Commission (2013), *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. See page 20.

37 *Ibid*, see pages 9 and 20.

38 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014. See paragraph 107.

39 TERA Consultants (2013), *Modification and development of the LRAIC model for fixed networks 2012-2014 in Denmark, Draft Model Reference Paper, Danish Business Authority Ref: 2012-55-DB-DBA - Fixed LRAIC*, May 2013.

40 TERA Consultants (2013), *Modification and development of the LRAIC model for fixed networks 2012-2014 in Denmark MEA ASSESSMENT, Danish Business Authority Ref: 2012-55-DB-DBA-v2.3*, February 2013.

41 TERA Consultants (2013), *Modification and development of the LRAIC model for fixed networks 2012-2014 in Denmark, Draft Model Reference Paper, Danish Business Authority Ref: 2012-55-DB-DBA - Fixed LRAIC*, May 2013. See pages 6 to 7.

does not intend to deploy a large scale FTTH network in the medium term. This differs from the local situation in Sweden where there is widespread deployment of FTTH, and regulated copper prices are based on a purely fibre cost model (with the use of radio-based technology for rural areas).

> It is noted that this is a different approach than the one used for example in Sweden. However, as TDC is not planning to deploy a large scale FTTH network and intends to rely on its copper and cable TV infrastructure to provide services, the context is different than in Sweden and it appears necessary to assess the costs of copper, including FTTC, and cable TV[42].

We conclude that the approaches adopted in Sweden and Denmark are tailored to the specific conditions that prevail in these countries, and as such are entirely consistent with the Final European Commission recommendation that the hypothetical efficient NGA network should be selected according to the access technology and network topology that best fits national circumstances. This is the precedent that the Commerce Commission should take from current European best practice, rather than Chorus' blanket statement that international precedent is to model the copper network. Thus the Commission should consider practices in those jurisdictions with many similarities to the New Zealand context. In this regard, we note that Network Strategies has previously pointed to the many similarities that exist between Sweden and New Zealand, in relation to geographical, demographic and topological features, as well as the large scale investment in fibre networks[43].

Chorus also refers to the Belgian regulator as 'currently engaged in modelling an operator which uses the existing network topology (FTTN)'[44], suggesting that this is an example of the 'substantial precedent for a copper MEA for UCLL'[45]. Although Chorus provides no

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42 TERA Consultants (2013), *Modification and development of the LRAIC model for fixed networks 2012-2014 in Denmark MEA ASSESSMENT, Danish Business Authority Ref: 2012-55-DB-DBA-v2.3*, February 2013, see page 39.

43 See, for example, Network Strategies (2013), *Unbundled bitstream access price review: update*, 2 September 2013.

44 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014. See paragraph 110.

45 *Ibid.*

citation we assume that it is referring to a consultation document published by BIPT in July 2013[46] which discusses a fixed network model developed by Analysys Mason over the period 2011 to 2012.

This model certainly does use the existing network topology but Chorus does not mention the relevant legal context in Belgium which obliges the regulator in cost-setting exercises to take account of existing and planned investments of the regulated operator in order to encourage investment in next generation networks, including a rate of return that compensates the operator for riskiness of future investments[47].

In other words, as it is a requirement in Belgium that the model reflects the regulated operator's (Belgacom's) network, the model must be closely linked to Belgacom's actual network. Hence the model assumes that the operator already exists rather than assuming an alternative operator enters the market, and it reflects Belgacom's historic and pending investment decisions. The operator deploys fibre to the cabinet (FTTC) and its next-generation network (NGN) IP-core with the same timeline as Belgacom, including the deployment approach for IP digital subscriber line access multiplexer (DSLAM) and voice access gateway equipment.

> Le calcul du coût suppose que l'opérateur existe déjà, et n'a pas besoin d'entrer ou de croître sur le marché comme un nouvel entrant, ou un entrant ultérieur. Il détient l'ensemble de sa part de marché et possède son propre réseau d'accès cuivre passif. «Existant » ne se réfère pas au fait que les coûts effectifs d'un opérateur réel soient ou non pris considération. Le modèle est basé sur un opérateur existant qui ne doit pas faire croître sa part de marché comme un nouvel entrant et ceci afin de s'assurer que les coûts correspondent à un opérateur avec une taille réelle/similaire à Belgacom et qui existe sur le marché depuis un certain temps[48].

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46 BIPT (2013) *Projet de decision du conseil de l'ibpt du 3 juillet 2013 concernant la tarification de l'offre « wholesale multicast » et du transport Ethernet pour les offres « BROBA » et « WBA VDSL2»*, 3 July 2013,

47 IBPT (2005), *Loi relative aux communications électroniques*, 13 June 2005. See Article 62.

48 BIPT (2013) *Projet de decision du conseil de l'ibpt du 3 juillet 2013 concernant la tarification de l'offre « wholesale multicast » et du transport Ethernet pour les offres « broba » et « WBA VDSL2»*, 3 July 2013. See Section 1.1.1.

7 Performance adjustments

Chorus raises concerns about the possibility that a performance adjustment may be introduced, should the Commission select a fibre MEA. It considers that such an adjustment may not be consistent with TSLRIC principles, and refers to changes in the legal framework in Switzerland as an example of the inconsistency of TSLRIC with a performance adjustment.

> The pre-existing legislation, which called for forward looking cost-based pricing methodology was clearly deemed not to allow for a performance adjustment[49].

Although currently Articles 54 and 58 of the Swiss Telecommunications Services Ordinance (TSO) do not specify a technology appropriate for MEA[50] from 1 July 2014 amendments to the TSO will prevent the use of copper as the MEA and specify that the MEA should be based on a new technology no longer depending on the twisted pair. The amendments also require that the difference between the MEA and infrastructure based on the twisted pair must be taken into account.[51]

BAKOM explains the reasons for the forthcoming change in legislation as follows:[52]

> The revision of the TSO became necessary because the applicable regulations did not take sufficient account of technical developments … Today, an operator would not construct a new copper network but would instead lay optical fibre.

Given that there is no widely accepted regulatory best practice with respect to the treatment of fibre as a MEA for copper, it appears that in Switzerland policy-makers have chosen to be very explicit concerning the need for a performance adjustment. This does not imply that an adjustment is required for consistency with TSLRIC principles. For example, in

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49 Chorus (2014), *Submission in response to the Commerce Commission's Further consultation on issues relating to determining a price for Chorus' UCLL and UBA services under the final pricing principle – Consultation Paper (14 March 2014) and Supplementary Paper (25 March 2014),* 11 April 2014. See paragraph 99.

50 SR 784.101.1 Ordinance on Telecommunications Services, available at http://www.admin.ch/ch/e/rs/784_101_1/index.html.

51 See http://www.news.admin.ch/NSBSubscriber/message/attachments/34080.pdf.

52 BAKOM (2014), *Calculating cost for the use of a telecommunications network*, press release, 14 March 2014.

contrast, in Sweden no performance adjustment was deemed necessary within the existing LRIC framework. Fibre and wireless are viewed as the MEAs for copper access technology, and as such minimise the forward-looking cost of the infrastructure with no adjustment for performance required. PTS perceives copper and fibre as substitutes, with fibre completely replacing copper in the long-term.

Note that in Switzerland a far higher proportion of broadband subscriptions remain on copper than in Sweden, so once again local circumstances are quite different.

Swisscom owns the copper network (offering ADSL and VDSL services to 98% of the population[53]) and engages in various fibre projects, while there is also a cable network from another provider with approximately 70% coverage of the country.[54] DSL and cable subscriptions as a proportion of the total broadband market have remained relatively constant since 2008, while fibre subscriptions constituted approximately 1% of broadband subscriptions in 2012 (Exhibit 2).

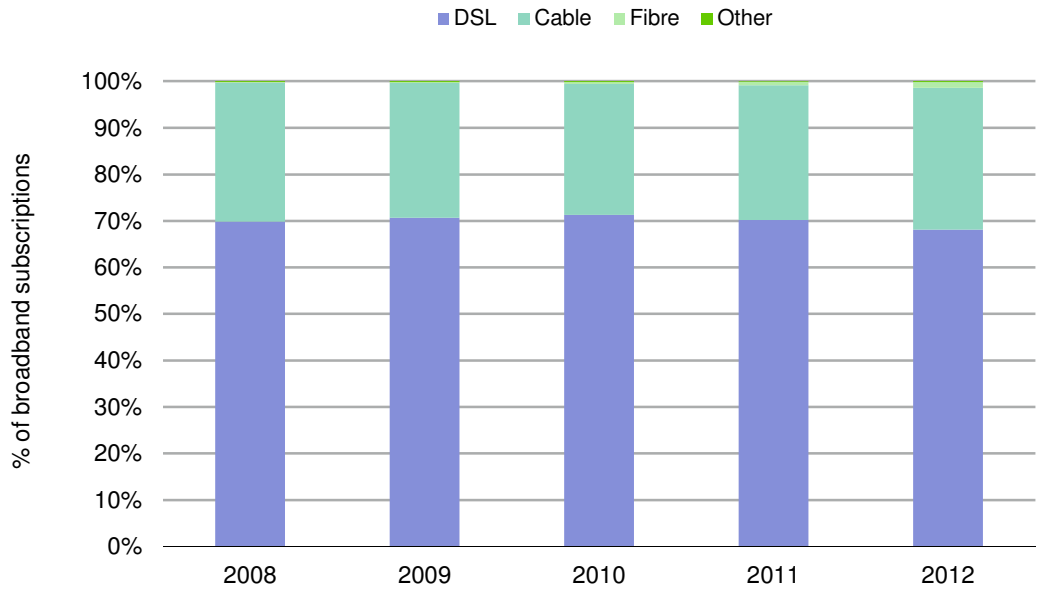
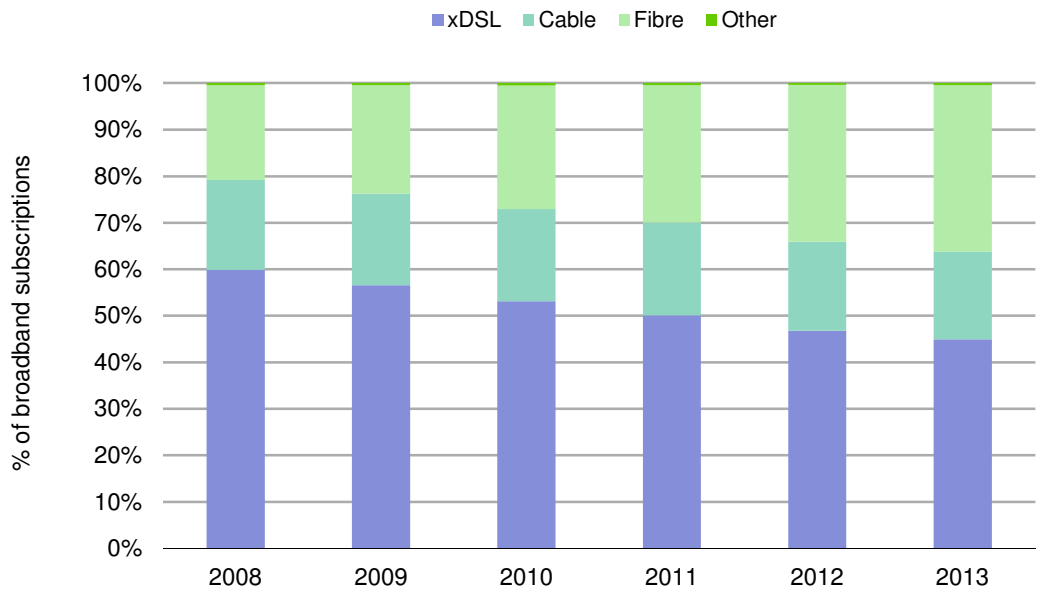


Exhibit 2: *Broadband by technology share, Switzerland, 2008-2012 [Source: BAKOM]*

53 Swisscom (2007), *Faster Internet access: VDSL bandwidths of up to 16,000 kbps are now a reality*, press release, 8 May 2007.

54 See http://www.upc-cablecom.ch/en/about/about-us/company/.

In the Swedish market the share of DSL subscriptions in the total broadband market has steadily decreased since 2008 whereas the share of cable subscriptions has remained relatively constant. The share of fibre subscriptions has increased from approximately 20% in 2008 to almost 36% in 2013 (Exhibit 3).



Note: 2013 values are for June whereas data for all other years are for December.

Exhibit 3: *Sweden – broadband by technology share, 2008-2013 [Source: PTS]*

Finally, Chorus claims that accommodating a cost-based performance adjustment may involve complexity and risk. The degree of difficulty in implementing such an adjustment is, however, irrelevant. The Commission must adopt appropriate measures to incorporate such an adjustment in the model, should it judge this necessary.

8 Concluding remarks

The legal framework in New Zealand requires the use of forward-looking costs in the estimation of a TSLRIC price for UCLL and UBA services. The Commission is therefore obliged to develop cost models based on a hypothetical efficient network using the MEA

construct. Regulators typically recognise that in times of technological progress the MEA should reflect the same or similar service potential as existing assets. Contrary to Chorus' claims, we find no evidence of regulators insisting that the MEA must replicate exactly the full functionality of the legacy network. While there are certainly different nuances in MEA definitions, the common feature is the emphasis on 'lowest cost', rather than consistent statements about replicating functionality.

As this is the first time in New Zealand that a cost model will be used to set UCLL and UBA prices, unlike many other regulators, the Commission has no local historical precedent that can be utilised as leverage to build incremental enhancements to an extant model.

Naturally the Commission should consider current European best practice. As such, the most recent relevant European Commission recommendation is that the hypothetical efficient NGA network should be selected according to the access technology and network topology that best fits national circumstances. In this regard we find no evidence that supports Chorus' blanket statement that international precedent is to model the copper network. Furthermore, the reality in New Zealand is that fibre is now a significant part of Chorus' network.

Consistent with the European Commission's recommendation, the approaches adopted in Sweden and Denmark are tailored to the specific conditions that prevail in these countries. The Swedish model provides a particularly relevant precedent for the Commission, showing that it is feasible for a LRIC model to accommodate multiple MEAs, which facilitates lowest cost technology choice. This is entirely consistent with the practices of an efficient operator deploying a network in current market conditions.

A common theme throughout Chorus' submission is an emphasis on avoiding complexity and saving resources – both cost and time. To that end, Chorus offers a number of suggestions that frequently run counter to the requirements of the final pricing principle. Such suggestions must be ignored – the Commission does not have the luxury of being able to diverge from the final pricing principle purely for reasons of convenience.