Final report for Spark New Zealand and Vodafone New Zealand

Cross-submission for consultation on UCLL and UBA FPP regulatory framework

A review of selected issues in submissions on the Commission's consultation paper of 9 July 2014

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0 Executive summary

Following a review of submissions on the Commerce Commission's July consultation in relation to determining a TSLRIC price for Chorus' unbundled copper local loop service (UCLL) and unbundled bitstream service (UBA) it is apparent that the Commission should clearly define the characteristics and constraints of the hypothetical efficient operator. Clarity on this point will resolve many of the issues that will arise in model implementation.

The hypothetical efficient operator is the new Chorus, not a competitor to Chorus. In other words, the relevant operator construct is a hypothetical efficient existing operator, sharing some similar characteristics with Chorus but unconstrained by previous legacy technology choices. In the modelling the hypothetical efficient operator will be artificially constrained by previous decisions by Chorus via the scorched node assumption, but it should not be unrealistically more constrained than Chorus. For example, the hypothetical efficient operator should not be constrained to the extent that it cannot locate civil structure where Chorus has located it previously. This suggests that the hypothetical efficient operator should be permitted to able to deploy aerially at a minimum where the actual operator has done so previously in addition to sharing third party assets where it is efficient to do so. This approach will deliver a modelled price that provides Chorus with incentives to use its existing infrastructure efficiently, and to the long-term benefit of end-users.

The hypothetical efficient operator's demand for the base year (that is, the initial year for which actual data is available) for the purposes of cost allocation should represent Chorus' demand for copper and UFB access, and this demand will be served by fibre and FWA. The base year demand must exclude demand on other networks (HFC and non-Chorus LFCs). Demand forecasts for subsequent years must be based on an informed view of market dynamics, taking into account demographic, economic and competitive factors.

This can be achieved via applying market share assumptions to forecasts of the total market, or conversely via a demand model for the hypothetical efficient operator.

It should be noted that two variants of demand should be used in the Commission's modelling. The network of the hypothetical efficient operator should be dimensioned based on premises passed, which will represent the addressable market, and be used to estimate total costs. Allocation of these costs will be based on the projected take-up of the hypothetical efficient operator's services.

The hypothetical efficient operator would make use of FWA in its network, deploying the latest release of LTE technology where it is efficient to do so. This is likely to be in the rural areas of the network where it could represent the least cost modern technology in at least both zones 3 and 4.

We recommend that the Commission should follow standard regulatory practice with relation to opex assumptions for TSLRIC models. While certainly we agree that the incumbent's actual costs are an input to such assumptions, in order to ensure that costs reflect those of an efficient operator the regulator must undertake a detailed efficiency study. Furthermore, we do not believe that Chorus' 'cost escalation' methodology for assessing trends in opex would deliver an improved outcome. Such a methodology is likely to lead to greater uncertainty and risk of bias, and indeed is unlikely to result in costs that reflect those of an efficient operator.

With respect to transaction charges, the hypothetical efficient operator, if it chose to outsource as Chorus has done, would commission contractors directly rather than via a middle man. Chorus suggests the addition of a margin to cover Chorus overheads, but this implies that access seekers will be paying both the service providers' margin and a second margin to Chorus, should the Commission accept Chorus' recommended approach. Depending on the magnitude of Chorus' proposed margin, access seekers may be required to pay more than the cost to Chorus had it chosen not to outsource which would not reflect efficient costs.

The basis on which one-off charges are set should be transparent to access seekers. In the absence of further information about the nature, duration and charging arrangements of Chorus' service contracts it is difficult to assess the efficiency of one-off charges based on

Chorus' actual payments to its contractors. We recommend that the Commission seeks further information from Chorus regarding the granularity of relevant information available from its service contracts, and Chorus' own expectations of the labour time involved in each of the regulated one-off service components.

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1 Introduction

This report considers Chorus' response[1] to the Commerce Commission's proposed views in relation to the regulatory framework and modelling approach for determining a TSLRIC price for Chorus' unbundled copper local loop service (UCLL) and unbundled bitstream service (UBA) in accordance with the Final Pricing Principle (FPP)[2].

Spark New Zealand (previously known as Telecom New Zealand) and Vodafone New Zealand (Vodafone) have requested that we comment on the following aspects of the Chorus submissions:

- the hypothetical efficient operator (Section 2)
- demand assumptions (Section 3)
- issues related to fixed wireless access (FWA) (Section 4)
- benchmarking and cost trends for operating expenditure (Section 0)
- transaction charges (Section 6)
- financial issues (Section 7).

Our recommendations are summarised in Section 8.

We have also commented on technical issues relating to aerial deployment in a separate report.

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1 Chorus (2014), *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.

2 Commerce Commission (2014), *Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services*, 9 July 2014.

Although this report has been commissioned by Spark New Zealand and Vodafone the views expressed here are entirely those of Network Strategies.

2 The hypothetical efficient operator: characteristics and constraints

The characteristics of the hypothetical efficient operator, together with the assumed constraints on its network deployment, will exercise a profound impact on the design and parameters of the model. In this section we explore Chorus' and its consultant's (Analysys Mason's) characterisations of the hypothetical operator, and consider whether these characterisations will achieve the Commission's objectives.

2.1 Chorus' view

In Chorus' opinion the hypothetical operator 'essentially steps into Chorus' shoes and becomes the network operator'[3]. Chorus notes that the purpose of the hypothetical operator construct is to 'provide guidance on an efficient level of costs'[4], delivering appropriate build / buy signals, but at the same time Chorus states that the estimated costs must be based on local realities.

> Setting prices based on the perceived costs of a feasible HNE [hypothetical new entrant] (and not an unrealistically efficient new entrant), will encourage efficient build/buy decisions in that it discourages inefficient duplication of infrastructure[5].

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3 Chorus (2014), *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 240.

4 *Ibid*, paragraph 32.

5 *Ibid*, paragraph 218.

Chorus characterises the hypothetical network operator as replacing its copper infrastructure to service Chorus' existing demand. Chorus' interprets the hypothetical operator as subject to the following requirements:

- delivering the same service and functionality as the regulated services
- possessing the same service profile as Chorus
- inheriting the Telecommunications Service Obligation (TSO)
- deploying nationally, covering the whole UCLL footprint.

Chorus also states that the hypothetical operator will be subject to the following constraints:

- externally imposed restrictions or costs, as Chorus is
- local rules, regulations and incentives to share
- no pre-existing pole and aerial distribution network
- aerial deployment only in areas where there are existing non-Chorus aerial networks, and constrained by planning and construction timeframes
- use of one technology rather than deploying a network which 'picks and chooses from several technologies'[6].

Chorus continually refers to the hypothetical operator as the 'hypothetical new entrant'. According to Chorus this hypothetical new entrant would deploy a replacement copper network, not in competition with Chorus but becoming the new efficient Chorus. By definition, however, a hypothetical new entrant would not deploy a copper network, but its MEA equivalent. Therefore, in fact, Chorus' hypothetical operator is not a hypothetical new entrant. Note that the Commission clearly states that the hypothetical operator will have no initial ramp-up of demand[7], hence by deduction the operator cannot be a new entrant, as the network must therefore be *in situ*.

6 *Ibid*, paragraph 261.

7 Commerce Commission (2014), *Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services*, 9 July 2014, paragraph 236.

2.2 Analysys Mason's view

Chorus' consultant Analysys Mason characterises the hypothetical operator as 'a hypothetical new entrant'[8] and contrasts a 'new entrant influenced only by commercial considerations' with New Zealand operators that are not in a greenfield scenario[9]. This comparison suggests that in Analysys Mason's view the hypothetical operator:

- has no existing assets
- has no government funding available to it
- must provide service to all locations in New Zealand
- must provide a comparable service to UCLL.

The statements made by Analysys Mason in relation to optimisation[10] indicate the conditions and constraints that apply to the Analysys Mason hypothetical new entrant:

- the network must provide the required functionality over time
- the same real world constraints as Chorus
- network sharing should be possible with entities that have assets in the required locations
- Chorus' poles, ducts and trenches are not available for sharing
- use of aerial deployment must be in locations consistent with local planning regulations
- capital and operating costs should reflect New Zealand conditions
- there should be provision for localised spare capacity.

The Analysys Mason interpretation of the hypothetical operator is, therefore, a greenfields new entrant that sets about replacing Chorus' network.

8 Analysys Mason (2014), *Response to Commission consultation on regulatory framework and modelling approach for UCLL and UBA*, 6 April 2014, Section 1.2.

9 *Ibid*, Section 1.8.

10 *Ibid*, Section 1.13.

2.3 Implications

Both Chorus and its consultant quite reasonably recommend that the Commission ensures that the hypothetical operator deploys its network facing the same real world constraints and local conditions as Chorus does. However Chorus also implies that **more** constraints should be applied to the hypothetical operator than in fact apply to Chorus, which in our view is unreasonable.

For example, Chorus asserts that in areas where demand is currently served by Chorus' pole network, aerial deployment will only be possible with new poles and as the hypothetical operator has no existing land use rights 'this will not be possible in most cases given the antipathy of local authorities to new poles'[11]. In other words, Chorus effectively is suggesting that the Commission should exclude the availability of aerial deployment to the hypothetical operator in locations where Chorus has aerial network, as well as in locations where there is no pre-existing aerial network (given the time and difficulties associated with obtaining the necessary local authority permissions). On this basis the hypothetical efficient operator will be more constrained than real world Chorus.

Chorus' consultant appears to be a little more generous than Chorus, stating:

> … it would not be reasonable to assume that the network was shared with an entity that does not have assets in the required locations[12]

By implication, then, Analysys Mason believes it would be reasonable to assume that the hypothetical network may be shared with an entity that does have assets in the required locations. These must presumably be third party assets in Analysys Mason's view, as it notes that Chorus' poles, ducts and trenches are not available for sharing. However this is quite irrelevant as, in Chorus' own view, the hypothetical operator replaces Chorus – it is not present in addition to Chorus. Sharing is then logically a non-issue.

11 *Ibid*, paragraph 77.

12 *Ibid*, section 1.13.

Both Chorus and Analysys Mason argue that economics would constrain the hypothetical efficient operator to select one technology for its network deployment.

> There are inherent costs to using multiple technologies and the costs must be taken into account in calculating the efficient cost of the network. To avoid these, an HNE could select the lowest cost MEA for its entire network[13].

It is notable that Analysys Mason expresses a different view in its recent report for the Portuguese regulator on LRIC modelling for fixed services. Although the focus of the report is fixed termination services, Analysys Mason discusses the access network as the choice of access technology has an impact on core and backbone network design, noting that a wireless network may be more cost efficient in rural areas.

> The model considers that the modern equivalent technology to provide voice services on a fixed network is VoIP over a fibre access network (or at least, in most of the network - it might be the case that in certain rural areas it could be more cost efficient to deploy a wireless network.). Therefore, the model considers a copper and fibre access network, without explicitly considering alternative technologies such as cable, wireless or other access technologies[14].

Chorus' proposed constraints on the hypothetical operator, taken together with Chorus' interpretation of requirements to be satisfied by the new operator, lead us to the conclusion that the hypothetical operator must deliver a replacement nationwide wired copper network with some Chorus assets *in situ* (scorched node) while other assets may not be located with or by existing Chorus assets. Using this interpretation the FPP model is likely to produce cost estimates that will exceed the efficient cost of supplying copper services and will not meet the Commission's objective of encouraging efficient build or buy decisions. Furthermore, the estimated cost is likely to be higher than the amount required for Chorus to maintain its copper infrastructure.

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13 *Ibid*, paragraph 261.

14 Analysys Mason (2013), *Conceptual approach for the fixed BU-LRIC model*, Report for discussion for ICP − Autoridade Nacional de Comunicações (ICP-ANACOM), 20 November 2013. Page 16.

2.4 Recommendations

If the Commission is to deliver appropriate build or buy signals then the hypothetical efficient operator must deploy an efficient network using the lowest cost technologies most suited to the various areas in which it will supply services. Typically this will not be one technology, but a mix of technologies. If the Commission's model reflects these costs, rather than the inflated current costs of Chorus' copper network, then we might expect an outcome which delivers efficient price signals.

The Commission should adopt a consistent characterisation of the hypothetical efficient operator as operating in either a brownfields or greenfields operating environment. In discussing the constraints on the hypothetical efficient operator Chorus and its consultant offer a mix of inconsistent and conflicting recommendations, some of which reflect brownfields and some greenfields environments. In a greenfields environment the hypothetical efficient operator effectively commences operations with a completely blank slate. This is not the case in a brownfields environment which assumes, for example, that some locations and assets pre-exist.

As the Commission has already stated its preference to adopt a modified scorched node approach in its modelling we assume that it regards brownfields as the appropriate operating environment. We recommend that the Commission applies this standard consistently. In other words, while the hypothetical efficient operator will be artificially constrained by previous decisions by Chorus via the scorched node assumption, it should not be more constrained than Chorus. For example, the hypothetical efficient operator should not be constrained to the extent that it cannot locate civil structure where Chorus has located it previously. This suggests that the hypothetical efficient operator should be permitted to share Chorus' civil infrastructure in addition to third party assets where it is efficient to do so. In any event, as already discussed, the hypothetical efficient operator is the new Chorus, not a competitor to Chorus. This recommendation will deliver a modelled price that provides Chorus with incentives to use its existing infrastructure efficiently, and to the long-term benefit of end-users.

The characterisation of the relevant operator construct as a hypothetical existing operator, rather than a hypothetical new entrant is consistent with Analysys Mason's recent recommendation to the Portuguese regulator. Analysys Mason describes the hypothetical

existing operator as having 'characteristics similar to, or derived from, the actual operators in the market, except for specific hypothetical aspects that are adjusted', in contrast to the hypothetical new entrant: 'an operator entering in 2013 with today's modern network architecture, which acquires an incumbent's share of the market'[15]. Note that use of the hypothetical existing operator construct does not imply that legacy technology should be included in the model, as noted by Analysys Mason:

> Legacy network deployments can be ignored if migration to next-generation technology is expected in the short-to-medium term or has already been observed in real networks.[16]

However, some real world characteristics of the operator being replaced would remain for the hypothetical existing operator: for example, it would be able to deploy aerially where the actual operator has done so previously.

15 *Ibid*, Section 3.1.

16 *Ibid*, section 3.1.

3 The demand approach

3.1 The 100% demand scenario: is it appropriate?

The Commission proposes that it should model 100% of demand, with the assumption that there is no initial ramp-up of demand nor migration away to alternative networks.[17]

Chorus however suggests that the demand forecasts need to reflect market dynamics, including:

- the hypothetical efficient operator serving Chorus' current demand for copper access
- migration to mobile and hybrid fibre cable (HFC) networks
- migration to non-Chorus LFCs
- migration to Chorus' UFB network.[18]

In the discussion to date, we believe that it is necessary to distinguish more clearly the use of the term 'demand' within a model for an access network. In short, 'demand' is required for two quite separate purposes within the model – dimensioning the network and allocation of costs – and each purpose requires a different type of demand.

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17 Commerce Commission (2014), *Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services*, 9 July 2014, paragraph 236.

18 Chorus (2014), *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 85.

Demand in network dimensioning

For the purposes of dimensioning an access network and estimating the total costs, the modeller must incorporate forecasts for premises passed. Premises passed will define the footprint of the hypothetical efficient operator's network and as such will represent its addressable market.

In a report for the Norwegian regulator, NPT, Analysys Mason notes:

> The size of an access network over time should not be dimensioned purely based on changes in service volumes. This would imply that major components such as the trench/duct deployed are changing over time in response to demand. In fact, the size is largely fixed at the time of initial deployment and is driven by the number of buildings passed. Hence, a projection of demand, rather than the actual demand carried, will be used to dimension the access network that reflects the number of buildings that are passed over time.[19]

As the Commission has noted that there will be no initial ramp up of the hypothetical efficient operator's network, it will have an existing footprint, which will be equivalent to Chorus' network footprint encompassing both the copper and UFB network. Over this footprint the hypothetical efficient operator will be delivering services over fibre and FWA.

An efficient operator will have a network footprint that will be able to address any anticipated expansion of premises passed, in accordance with known demographic and planning projections with new housing estates and other developments, and so there is likely to be minimal increase in the network footprint over the short- to medium-term. However over the longer term, some network expansion may be required with the extension of the planning horizon for new developments.

This network footprint will encompass locations in which the hypothetical efficient operator is the sole provider, as well as areas in which there are alternative networks, such as HFC and the non-Chorus LFCs.

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19 Analysys Mason (2010), *Conceptual approach for the LRIC model for fixed networks*, 11 February 2010, Section 3.1.1.

Demand for cost allocation

The second type of demand required for modelling is required for the allocation of the total costs of the hypothetical network operator to the services that utilise its network assets. In simple terms, total costs must be divided by the number of services to obtain a cost per unit demand.

Clearly, these services will include some proportion of the hypothetical efficient operator's addressable market for access services – it will not be 100% as there are alternative network providers in some areas (HFC and non-Chorus LFCs). Furthermore, this demand must also include demand for all services – both regulated and non-regulated – that utilise the network assets. Failure to encompass all such demand will incorrectly allocate costs and result in an over-statement of the cost per-unit demand.

Characteristics of demand

We agree with Chorus' view that the Commission's 100% demand approach is unusual. In TSLRIC models demand for the hypothetical efficient operator is often determined by applying a market share assumption to forecasts of total market demand.

While Chorus is dominant in the New Zealand fixed access market it does not have 100% market share. The fixed access market also includes Vodafone's HFC network and non-Chorus LFC's fibre networks. It is inappropriate to include this demand in the demand for the hypothetical efficient operator – rather the Commission must assume a market share for the operator, which will be informed by potential competitive outcomes. As TERA notes in its report to the Commission:

> The total future demand for FTTH and FWA connections depends on the assumptions of FTTH/FWA take-up. The take-up rate is calculated as a proportion of the total broadband minus the demand on competing networks.[20]

[20] TERA Consultants (2014), *TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services: Modern Equivalent Assets and relevant scenarios*, July 2014, Section 3.3.1.2.

An alternative approach used by regulators is to develop notional demand forecasts for the hypothetical efficient operator, an example of which is discussed in Section 3.2 below.

Furthermore, as fibre will be MEA for the hypothetical efficient operator, and there is to be no initial ramp-up of demand, the demand for the hypothetical efficient operator must be equivalent to the aggregate demand for the operator's copper, fibre and FWA, otherwise the costs per unit demand will be overstated as they will not be correctly allocated to all the services that utilise the network.

Note that in regards to FWA demand, even though Chorus may not currently offer such services, the Commission's model should allow for the hypothetical efficient operator to deliver FWA-based services, if that technology proves to be the least cost alternative for rural zones.

3.2 United Kingdom: notional demand from a regulatory forecasting model

In its process for setting charge controls for unbundled local loop (LLU) and wholesale line rental (WLR) for the period 2014/15 to 2016/17, the UK regulator Ofcom developed its own volume forecasting model. Ofcom stresses that the forecasts are used only for the purposes of setting the charge controls:

> As these volume forecasts are based on a hypothetical ongoing copper network they do not represent Ofcom's view of actual 'real world' volumes and should be considered on that basis.[21]

Ofcom's forecasts take as a basis the incumbent operator's (BT's) copper network assuming that there is no deployment and take-up of Next Generation Access (NGA) services. Note that this is a consequence of Ofcom's underlying approach of 'anchor pricing', which differs from the MEA principle of LRIC modelling:

21 Ofcom (2013), *Fixed access market reviews: Approach to setting LLU and WLR Charge Controls: Annexes*, updated 20 August 2013, footnote 51.

> The anchor pricing approach is intended to give the regulated firm incentives to invest in new technology only when providing services over the new technology would lower its overall costs and/or would enable it to provide higher quality services for which consumers are willing to pay a premium. At the same time, consumers of existing services are not made worse off by the adoption of new technology. The price (and quality) of existing services are anchored by the legacy technology, even if the services are actually provided over new technology.[22]

For its most recent forecasting model, which produces forecasts for the period 2012/13 to 2016/17, Ofcom states that it:

> …identif[ies] the drivers of volumes for different services and using a combination of quantitative data and regulatory judgement forecast[s] their effect on volumes. Where possible, we use input data which is publicly available allowing us to publish our model, with the aim of improving the transparency of our analysis.
>
> However, there are many reasons why a forecast is likely to diverge from outturn figures, particularly when market developments cannot be foreseen, or where there are complex interactions between the different services being modelled. While we have aimed to provide a forecast based on current knowledge and data, we welcome respondents' views on the parameters included in our model and suggestions about other parameters which could materially affect forecast volumes but which have not been included in our model.[23]

Ofcom identified that there are five primary drivers for demand for copper lines:

- the change in the number of mobile-only households
- the change in the number of households
- the change in the number of business sites and lines
- competition from cable
- the roll-out of fibre-based access networks (NGA).

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22 Ofcom (2013), *Fixed access market reviews: Approach to setting LLU and WLR Charge Controls*, updated 20 August 2013, paragraph 3.36.

23 Ofcom (2013), *Fixed access market reviews: Approach to setting LLU and WLR Charge Controls: Annexes*, updated 20 August 2013, paragraphs A8.6-A8.7. Note that the forecasting model can be downloaded from Ofcom's website.

Ofcom's model also considers the following additional parameters:

- the change in the number of lines per household that use a fixed service
- the change in the number of lines per business site
- broadband market shares
- customer churn between broadband providers
- the potential for further LLU roll-out
- recent LLU consolidation
- broadband penetration
- the split between MPF (metallic path facility – fully unbundled local loop) and WLR+SMPF (shared metallic path facility).

3.3 Sweden: declining market calibrated for actual lines

In the case of the Swedish fixed access model (version 10.1)[24] PTS states that normally the network is dimensioned for the demand of the base year only. However the model allows for the input of future demand (by type of line) for up to three years after the base year. Nonetheless PTS states that there is no need to include these projections as the model already allows for assumptions relating to spare capacity required due to future growth, and thus for 'normal growth' it is not necessary to input demand projections. Nonetheless the model is calibrated for actual lines in Sweden.

PTS also commented that the number of access lines has decreased in all zones, which has meant that some zones have been reclassified to a geotype with lower line density.[25]

3.4 Recommendations

We do not agree with Chorus' view that demand should include only existing copper demand. Given that the hypothetical efficient operator is to be operating a FTTH/FWA

24 PTS (2013), *Dokumentation av hybridmodell v.10.1*, 16 December 2013, Section 4.2.1.

25 *Ibid*, Section 4.1.3.

network, we recommend that demand for the base year (that is, the initial year for which actual data is available) for the purposes of cost allocation should represent Chorus' demand for copper and UFB access, and this demand will be served by fibre and FWA. The base year demand must exclude demand on other networks (HFC and non-Chorus LFCs).

Demand forecasts for subsequent years must be based on an informed view of market dynamics, taking into account demographic, economic and competitive factors. This can be achieved via applying market share assumptions to forecasts of the total market, or conversely via a demand model for the hypothetical efficient operator. We recommend that, as in the case of Ofcom, the Commission needs to base this view on publicly available information wherever possible, to allow for transparency of the methodology and assumptions.

4 Fixed wireless access

4.1 Should FWA be included in the model?

Chorus recommends that FWA should be excluded from the Commission's model as its characteristics do not mirror those of the UCLL service. Our view is that a hypothetical efficient operator would without doubt utilise FWA in the deployment of a fixed access network in New Zealand today, and as such it must be included in the model. As a result of superior performance capabilities, in overseas jurisdictions certain FWA technologies have qualified for use in NGA networks. In its Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks, the European Commission states that NGA networks:

> … are access networks which rely wholly or partly on optical elements and which are capable of delivering broadband access services with enhanced characteristics as compared to existing basic broadband networks. Coaxial, wireless and mobile technologies make use, to a certain extent, of a fibre support infrastructure, thereby making them conceptually similar to a wired network using copper to deliver the service for the part of the last mile not covered by fibre. [26]

The European Commission also discusses the rapid technological improvements in wireless technologies and believes that wireless access networks can be a suitable alternative to wired networks as they are capable of delivering speeds and performance comparable to wired networks. Hence the Commission defines NGA networks as:

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26 European Commission (2013), *EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks*, 26 January 2013.

> (i) fibre-based access networks (FTTx); (ii) advanced upgraded cable networks; and (iii) certain advanced wireless access networks capable of delivering reliable high speeds per subscriber.[27]

UK Broadband Limited (UKB)[28] compares the capacity, speed and performance of FWA to wired broadband:

> Fixed wireless broadband (in the case of UKB – fixed 4G wireless broadband) is comparable to, and in certain instances superior to, partial fibre upgrade of copper networks in specific geographic areas.
>
> UKB firmly believes that fixed 4G wireless offers in capacity and speed terms, a superior broadband platform to FTTC for certain distances from the cabinet i.e. fixed 4G has far greater (and higher capacity) broadband reach than FTTC beyond certain distances.
>
> Its (fixed wireless) network can deliver NGA speeds (over 30Mbps) at much greater distances from the serving cell site (over 7Km) than Fibre to the cabinet (FTTC) solutions are able to deliver (only 1.5km – assuming good copper connections – from the cabinet).[29]

A benefit of using FWA networks is that operators can improve the network – mitigate faults, improve failure rates and increase coverage/capacity (to meet the growing demand) – smoothly, by upgrading the technology, adding spectrum channels or deploying additional base stations. UKB also discussed the advantage of FWA over FTTC, stating:

> One of the additional advantages of a fixed wireless 4G network versus FTTC is that it can be rapidly deployed in a given area and then incremental capacity can be added as demand grows.[30]

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27 *Ibid*.

28 UK Broadband Limited is a 4G LTE wireless solutions business operating in the United Kingdom.

29 UK Broadband Limited (2012), *UK Broadband Limited Response EU Draft Guidelines for the application of state aid rules in relation to the rapid deployment of broadband networks*, October 2012.

30 *Ibid*.

This comparison between FTTC and FWA is relevant since many of the zone 3 areas and some of the zone 4 areas in which FWA would provide an efficient solution today in New Zealand are served by FTTC. In our earlier submission[31] we recommended that the Commission considers FWA for modelled access service provision in zone 3 and zone 4.

4.2 Scope of the modelled service

Chorus notes that RBI premises not served by Chorus' copper/FTTN network are beyond scope of the service being modelled, and that, as such the examples of Sweden and Australia should not be regarded as precedents for the use of FWA in the modelling.

> As we have previously submitted, in relation to those end users not currently served by fixed line, the scopes of the services being modelled are defined in the UCLL and UBA STDs. Those RBI premises which are not served by Chorus' copper/FTTN network are beyond the scope of the service being modelled. In short, Sweden and Australia are not a precedent for replacing fixed line access with FWA[32].

In an earlier submission Chorus provided additional information on its position regarding the geographic scope of modelling in relation to the UCLL service:

> But the scope of the UCLL STD service obligation is described by the copper local loop network (whether inside or outside the TSO area). Therefore, the area relevant to identifying the TSLRIC cost of the UCLL STD service is not the TSO area per se, but the area served by Chorus' copper local loop network which is not cabinetised. This includes: those parts of the copper local loop network which service Chorus' active endusers, who are currently taking the UCLL service; and those remaining parts of the network that are

31 Network Strategies (2014), *Key issues in modelling UBA and UCLL services*, 6 August 2014.

32 Chorus (2014), Chorus (2014), *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 362.

currently inactive but not disconnected. If an RSP were to request that Chorus provide UCLL in relation to these lines, the STD would oblige Chorus to do so[33].

The Commission's preliminary view is that it will not individually model the non-cabinetised local loop network 'because our modelling will not involve exactly replicating the current existing network'[34]. We agree with the Commission's view that it should model costs that encompass both the cabinetised and non-cabinetised network and not model these individually. We believe that the Commission should take care to address in the modelling subsidies or customer contributions paid to Chorus for the connection of copper lines. Note that outside TSO areas Chorus has the ability to request that customers contribute to the cost of connection.

We do not believe that it follows from Chorus' statements regarding the geographical scope of the modelled service that FWA should be excluded from the modelling. As noted by Chorus, wireless technology was used in the 2008 fixed access model that Analysys Mason developed for the ACCC. The Analysys Mason model encompassed access network algorithms that deployed the most cost-efficient solution by ESA, selecting copper, fibre, wireless or satellite. The modelled wireless technology was based on GSM 900MHz parameters[35]. While this 2G technology implementation may have been cost-efficient in only 1% of sites in 2008, with a more modern choice of wireless technology the results may be quite different in 2014.

33 Chorus (2014), *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 274.

34 Commerce Commission (2014), *Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services*, 9 July 2014. Paragraph 202.

35 ACCC (2008), *Analysys cost model for Australian fixed network services*, December 2008. See Section 5.1.2.

4.3 Modelling FWA

Chorus warns the Commission that many costs must be included if FWA is to be modelled as a viable network service, and that the Commission should adopt a conservative stance with any assumptions regarding FWA. In particular, Chorus discusses[36] three cost drivers:

- costs incurred to reach 100% of end users in the relevant coverage areas
- costs incurred to provide sufficient capacity and throughput per end user
- cost incurred to utilise uninterrupted radio spectrum.

In modelling FWA the Commission should take into account appropriate costs that the hypothetical efficient operator would incur in the efficient provision of the service. However we do not believe that the Commission should make *ex ante* decisions based on perceptions that the costs of the technology might be relatively high to reach 100% of end users in proposed coverage areas. The Commission through its modelling should determine where it is efficient to deploy a FWA solution rather than a fibre solution, and in some areas this may be a mix of the technologies rather than exclusive use of one technology. For example, as we noted in our earlier report[37], some of Chorus' suburban exchange area definitions include low population (farming) areas which typically are adjacent to rural urban centres. We would expect a mix of technologies to be cost-efficient in such areas.

Chorus notes that the technology should be capable of meeting the minimum requirements of the TSO and refers to comments on fade margin assumptions in Murray Milner's TSO report from 2007. Chorus recommends 'that the Commission revisit the reports of the independent experts it used during that modelling process and Telecom's expert, Dr Murray Milner'.[38]

However, the choice of technology is critical to the performance of FWA networks, and there have been significant changes in technology since 2007 which makes the relevance of

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36 Chorus (2014), *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 337.

37 Network Strategies (2014), *Key issues in modelling UBA and UCLL services*, 6 August 2014. Section 3.2.

38 Chorus (2014), *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 240.

these reports in the present day context questionable. For example, the fade margin for LTE is lower than 3G technologies (used previously) because fast fading margin in LTE is negligible.[39] In addition LTE provides huge improvements (over the 3G technologies) in terms of higher data rates, lower latency, reduced packet loss, lower failure rates and greater spectral efficiencies. LTE also offers scalable bandwidth allowing inter- and intra-band carrier aggregation and provides improved coverage and cell edge data rates. Apart from the improvements in technology the use of 700MHz spectrum band enables better coverage (compared to the higher frequency bands which were being considered/used previously) and the slow fading margins are lower in rural areas (compared to urban areas).[40] Hence the Commission's model should consider design parameters for the latest technology being deployed in New Zealand and current circumstances rather those of seven years ago.

4.4 Recommendations

We recommend that the Commission includes FWA in its MEA, so that it is deployed by the hypothetical efficient operator where it is efficient to do so. This is likely to be in the rural areas of the network and as we have previously noted[41] could represent the least cost modern technology in at least both zones 3 and 4. The design parameters must be based on the latest available release of LTE technology.

39 Holma H. and Toskala A. (2011), *LTE for UMTS: Evolution to LTE-Advanced*, John Wiley & Sons, pages 265-270.

40 Song L. and Shen J. (2010), *Evolved Cellular Network Planning and Optimization for UMTS and LTE*, CRC Press, page 139.

41 Network Strategies (2014), *Key issues in modelling UBA and UCLL services*, 6 August 2014.

5 Operating expenditure

In this section we explore issues associated with the use of operating expenditure (opex) data from the incumbent operator in TSLRIC modelling. In particular we examine the use of benchmarks, and how opex may be expected to vary over time.

5.1 Benchmarking opex

Chorus claims that its own operating expenditure (opex) would represent the most appropriate information on which to base the opex for the hypothetical efficient operator. This, it is claimed, would 'reflect an achievable standard of efficiency', with potential adjustments for the choice of MEA, the types of deployment in the network and any perceived inefficiencies.[42]

We agree with Chorus in that incumbents' opex is often used to determine an appropriate opex for bottom-up TSLRIC models, however we note that efficiency adjustments are commonly applied. For a number of years in the United Kingdom Ofcom has conducted detailed analyses in order to set efficiency adjustments for the charge controls of regulated services. As part of its 2014 fixed access market reviews, Ofcom noted:

> Further, as in previous Charge Controls, we have proposed to include efficiency assumptions which should act as an incentive on Openreach to achieve operational efficiencies. We consider that this approach, which is not linked to specific expectations of

42 Chorus (2014), *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 115.

> individual process improvements but rather to historical outcomes of cost reductions, provides the most appropriate route to incorporating cost savings in the charges.[43]

Ofcom's efficiency analyses consider a range of indicators, encompassing historical trend analysis, operator documents and public statements, analyst reports and external benchmarks – the latter from both UK and international firms.[44]

Chorus has not been subject to a similar scrutiny of its efficiency. Indeed, in its 2013 report on the approach for a BU-LRIC model for fixed termination on behalf of ICP-ANACOM, the Portuguese regulator, Analysys Mason makes the recommendation:

> The Portuguese operators are active in a competitive market, which includes both the competitive supply of services to end users, and the competitive supply of infrastructure and services to those operators. Therefore, the *a priori* expectation of inefficiencies in the market may be limited. However, it is still necessary to ensure that there is a robust assessment of efficiently incurred costs.[45]

Chorus cites the Ernst & Young assessment of its financial position in support of its opex levels. This study stated that:

> Chorus' FY13 EBITDA margin was 62.7% which is broadly in line with its peers (59.4% average for New Zealand peers and 62.2% average for Australian peers). The operating cost to income ratio of Chorus is also similar to that of its peers.[46]

The comparison encompassed a group of New Zealand and Australian infrastructure businesses (Exhibit 5.1). No companies from the telecommunications sector were included in this comparison. Ernst & Young noted that LFCs were not considered as they represent

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43 Ofcom (2013), *Fixed access market reviews: Openreach quality of service and approach to setting LLU and WLR Charge Controls*, 19 December 2013, paragraph 3.69.

44 Ofcom (2013), *Fixed access market reviews: Approach to setting LLU and WLR Charge Controls*, updated 20 August 2013, Annex 7.

45 Analysys Mason (2013), Conceptual approach for the fixed BU-LRIC model, Report for discussion for ICP − Autoridade Nacional de Comunicações (ICP-ANACOM), 20 November 2013, Section 2.4.

46 Ernst & Young (2013), *Independent Assessment of Chorus' Financial Position*, 12 December 2013, appendix 7.

significantly smaller operation to that of Chorus, and they had no copper infrastructure. Comparisons with international telecommunications companies were not considered as the nature of such firms differ from that of the structurally separated Chorus. The lack of any telecommunications firms in this sample is a concern – while there are certain similarities with lines companies, the businesses are subject to differing drivers.

Country	*Company*	*Industry*	*Nature of business*
New Zealand	Vector	Gas and electricity distribution	A multi-network infrastructure company serving New Zealand across the electricity, gas and telecommunications sectors
New Zealand	Transpower	Electricity distribution	State-owned enterprise that plans, builds, maintains and operates New Zealand's national electricity grid
New Zealand	Powerco	Gas and electricity distribution	A leading New Zealand electricity and gas infrastructure company
New Zealand	Auckland Airport	Aviation	New Zealand's major aviation transport hub
New Zealand	Port of Tauranga	Maritime	Operators of the primary port in New Zealand
Australia	SP AusNet	Gas and electricity transmission and distribution	An electricity transmission and electricity/gas distribution network based in Victoria, Australia
Australia	APA Group	Gas distribution	A major gas transportation and storage business with interests in energy infrastructure across mainland Australia
Australia	AusGrid	Electricity distribution	An electricity distribution network operator in New South Wales, Australia
Australia	DUET Group	Electricity and gas distribution	Large gas and electricity distribution conglomerate operating across Australia
Australia	Envestra	Gas transmission and distribution	An energy company operating natural gas transmission and distribution networks throughout Australia

Exhibit 5.1: *Infrastructure businesses used as comparators for Chorus [Source: Ernst & Young]*

We also note that Ernst & Young's comparison was based on top level financial accounts, which give no insight on the opex for regulated services. Furthermore, the comparison does not provide any information on the efficiency of Chorus' operations for regulated services, and indeed relies only upon a single metric, the operating cost to income ratio, and only for

one financial year. This is insufficient evidence to support Chorus' claim of the costs representing an achievable standard of efficiency – especially in comparison to the wealth of information considered by Ofcom with respect to Openreach or Analysys Mason's recommendation for Portugal.

If we examine the financial accounts of BT Group for the year ending in March 2013, it is possible to identify that the operating cost to income ratio for Openreach was 48.3%, which is considerably higher than that of Chorus (37.3% for the 2012/13 financial year, ending in June). It has already been identified[47] that Openreach is an appropriate comparator for Chorus, however this single datapoint is not necessarily proof that Chorus is more efficient than Openreach.

While Chorus has also been subject to price controls for its regulated services, the history of price regulation in New Zealand has meant that in numerous cases conservative assumptions and approaches have been applied, to minimise the effect of regulatory hardship. It is therefore entirely possible that past regulatory prices do not reflect the costs of an efficient operator (unlike the situation for Openreach, where as noted above Ofcom has imposed efficiency adjustments for a number of years), and thus Chorus may have obtained greater margins from more generous pricing arrangements than those of Openreach, with the net effect being a relatively low operating cost to income ratio for 2012/13.

Without an in-depth investigation of Chorus' operating costs, it would be premature to assume that these costs represent those of an efficient operator.

To that end, we recommend that the Commission examine a range of suitable metrics, including cost data from international fixed access models, appropriately adjusted to reflect differences in labour rates and other key inputs. Where currency conversion is required we recommend use of the Purchasing Power Parity (PPP) standard, as this will adjust for differences in input costs, such as labour rates.

47 See for example Network Strategies (2014), *Setting a value for the WACC: benchmarking, risk and uncertainty*, 11 April 2014.

5.2 How should opex change over time?

As the Commission is required to model costs over a five year timeframe, its methodology needs to be able to incorporate changes in costs – both capital and operating costs – over time.

We note that Chorus assumes that operating costs will rise over time – this is also emphasised by its use of the term 'cost escalation' rather than our preferred term of cost trend which makes no assumption as to the direction of that trend.

In our experience, operating costs are subject to a variety of influences, and the net impact is far from certain:

- as network elements age, they may become more expensive to maintain as the effort required may increase
- some network elements may become less expensive to maintain over time – new technology may be relatively expensive initially, but costs could reduce as it becomes more widely deployed
- the costs of inputs to network elements may either increase or decrease over time
- productivity gains will reduce operating costs.

Chorus proposes that the Commission should adopt a 'cost escalation methodology' to estimate changes in input costs over time:

> For example, there may not be reliable forecasts of the cost of network elements such as cabinets, exchange housings, or telecommunications cables.
>
> However, reliable forecasts may exist for the raw inputs to construct these network elements. Raw inputs may be wages in the construction sector, aluminium sheeting, fabricated steel and fibre optic cabling. For many of these raw inputs there are raw material futures markets and independent expert forecasts that could be used to inform the forecast of the price of the network elements.

> These forecasts of price changes for raw materials can be coupled with an assumption of the weighting of materials within each network element to determine the expected change in the input cost of the network element.[48]

We note that while Chorus claims that a 'cost escalation' methodology is used by regulators in other jurisdictions, it does not cite any specific telecommunications examples in support of its proposed methodology.

While Chorus claims that this methodology is associated with a high degree of transparency, we note that it relies on the availability of extensive data, as well as many assumptions regarding not only the forecasts of the raw materials but also the relationship between the raw materials and the network elements.

Identify and obtain forecasts for the inputs

The methodology would require the Commission to identify all inputs to the network elements, and source appropriate forecasts for those inputs. While for some inputs, such as labour rates, this may be relatively straightforward, other inputs may be more problematic. There may be widely differing views on the outlook for some inputs – such as copper prices – which would require the Commission to determine an appropriate forecast. Other inputs may be much more difficult to identify, let alone obtain reasonable forecasts: for example once the costs of labour and raw materials have been subtracted from the total cost, how would any remainder be handled?

Weightings and production functions

Detailed assumptions must be used to determine the weightings of the various components of each of the network elements. For some network elements this process may be far from straightforward.

Furthermore, the Commission would need to make additional assumptions regarding the production function – that is, the relationship between the costs of the various components and the

48 Chorus (2014), *Submission in response to the Commerce Commission's consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)*, 6 August 2014. Paragraphs 131-133.

costs of the network elements. There are several possible models, including:

- Zero Elasticity production function, where the weightings remain constant over time
- Cobb-Douglas production function, where the relative proportions of the individual elements are fixed, regardless of how the cost trends vary.

In other words, rather than making a single assumption on a trend for operating costs for each network element, for each network element multiple assumptions will be required, each of which will have an associated level of uncertainty. This is clearly one instance where greater granularity of data will not lead to greater precision – indeed it will result in a higher degree of uncertainty and more risk of error, particularly if a conservative approach is adopted for each underlying assumption. In the latter case the introduction of that type of bias would mean that the resultant costs would no longer represent those of an efficient operator.

In addition, Chorus claims that:

> …the Commission should determine the base level of operating costs on an average of operating costs over the life of the assets.[49]

This, in our view, is an astonishing request, particularly for assets with long lifetimes, such as cable (often assumed to have a lifetime of 40 years in regulatory modelling). A more usual approach for cost models that encompass multi-year timeframes is for the cost trends to be included within the model so that the appropriate operating cost in any year is determined from the base cost with the relevant trend applied.

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49 Chorus (2014), *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 124.

5.3 Recommendations

We recommend that the Commission should follow standard regulatory practice with relation to opex assumptions for TSLRIC models. While certainly we agree that the incumbent's actual costs are an input to such assumptions, in order to ensure that costs reflect those of an efficient operator the regulator must undertake a detailed efficiency study. As noted above, such studies are necessary even in markets with active competition such as Portugal, but become even more essential in the Chorus-dominated New Zealand market.

Furthermore, we do not believe that Chorus' 'cost escalation' methodology for assessing trends in opex would deliver an improved outcome. Such as methodology is likely to lead to greater uncertainty and risk of bias, and indeed is unlikely to result in costs that reflect those of an efficient operator.

Our preferred approach for incorporating cost trends is for the model to include opex for a base year, and then apply a trend expressed as an annual percentage change in opex for the specified network element (rather than Chorus' approach which requires disaggregation of the network elements into multiple components). So opex becomes a time series of values, rather than a single datapoint, and in each year of the model timeframe the matching opex value is used. This is a standard modelling approach.

6 Transaction charges

6.1 Background

Chorus notes that the Commission is yet to address the issue of one-off or transaction charges (relating to new connection charges, transfers and other core charges), which form part of the current review. In order to allow sufficient time for consultation, Chorus proposes that this process should commence prior to the publication of the Draft Determination on 1 December 2014. As such Chorus has provided its initial proposal for costing one-off charges.

6.2 Chorus proposal

Many of the tasks associated with one-off charges have been outsourced by Chorus. Consequently Chorus recommends that the Commission bases charges on the actual prices paid by Chorus to its service companies plus a mark-up for Chorus' internal costs. Furthermore, Chorus proposes that the Commission apply a 'cost escalation' methodology to the charges to cover likely changes in the costs over the regulatory period.

Chorus claims that a hypothetical efficient operator would incur the same charges as it has incurred because:

- the service contracts were let following a nationwide competitive tender process, conducted at arms-length
- Chorus did not treat the prices as 'simply a pass-through cost' as the prices charged also apply to Chorus' own business inputs.

Chorus notes that an alternative approach would involve the development of a bottom-up model which would estimate charges based on time, materials and overhead costs associated with each activity. Chorus characterises this approach as 'complex and time consuming'. The major component of these charges is labour and, according to Chorus, it is difficult to define standard tasks where the tasks involve different staff and locations (and hence travelling time).

6.3 Recommendations

The basis on which one-off charges are set should be transparent to access seekers. In the absence of further information about the nature, duration and charging arrangements of Chorus' service contracts it is difficult to assess the efficiency of one-off charges based on Chorus' actual payments to its contractors. By its own admission Chorus' contractors perform tasks for Chorus directly, as well as indirectly in response to access seekers' requests. This indicates that the service contracts may be bulk contracts, applicable to the supply of services for both non-regulated and regulated activities. As such it would be necessary, as a preliminary step, to determine which charges relate specifically to the regulated activities, and then to assess whether these charges are reasonable. Since the charges will be predominantly in respect to labour, it may be difficult to make this assessment without estimates of the time involved.

If the service contracts are simply based on time-and-materials, then we presume that Chorus must have *a priori* expectations of the time (on average) it would take a contractor to perform each of the one-off service components. Without such expectations it would be difficult to budget in advance for service charges, and it would also be difficult to assess *ex post* whether the invoices from contractors are reasonable. Consequently, Chorus should make available to access seekers information on the average labour time expected per activity. While the simplest approach would be to use averages as the basis of charging, the suitability of this for modelling transaction costs will depend upon the actual charging arrangements of Chorus' service contracts. Averages would be appropriate if those charging arrangements are on a time-and-materials basis, however may be misleading if other pricing structures are used – for example a flat rate if a task is less than an agreed number of minutes, and then a timed rate for tasks that take longer.

We recommend that the Commission seeks further information from Chorus regarding the granularity of relevant information available from its service contracts, and Chorus' own expectations of the labour time involved in each of the regulated one-off service components.

Chorus suggests the addition of a margin to cover Chorus overheads, but this implies that access seekers will be paying both the service providers' margin and a second margin to Chorus, should the Commission accept Chorus' recommended approach. We presume that Chorus chose to outsource these activities because it would be more cost-effective to do so. Depending on the magnitude of Chorus' proposed margin, access seekers may be required to pay more than the cost to Chorus had it chosen not to outsource. Clearly this arrangement would not represent efficient pricing, as the hypothetical efficient operator (if it chose to outsource) would commission contractors directly rather than via a middle man.

Finally, for future charges over the regulatory period it would be inappropriate to apply any 'cost escalation' methodology without information on the duration and any provisions for cost trends in Chorus' service contracts, followed by an assessment of whether such provisions are reasonable.

7 Financial issues

7.1 Depreciation

Chorus proposes the use of an adjusted tilted annuity for calculating depreciation, where the tilt reflects not only changes in asset costs, but also changes in demand.[50]

Whether the Commission should use a tilted annuity or an adjusted tilted annuity will depend upon its assumptions regarding demand. Given our recommendations regarding demand for the hypothetical efficient operator (Section 3.4), demand will be far less volatile than if copper and fibre demand were to be treated separately.

The Swedish regulator, PTS, notes that in the case of its fixed access model the choice of depreciation method has little effect on the level of depreciation, as the network is fully deployed in the initial year of the model and demand is relatively flat.[51]

Without knowledge of the Commission's demand forecasts we cannot at this stage recommend whether or not the tilt should be adjusted for changes in demand.

We do endorse the use of tilted annuities where there are changes in asset costs (cost trends). The cost trends may be due to changes in the costs of the raw materials, or may be due to productivity improvements or technological developments. While Chorus discusses

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50 Chorus (2014), *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 125.

51 PTS (2012), *Utkast till modellreferensdokument (MRD rev d) Riktlinjer för framtagandet av LRIC- bottom up- och top down-modeller*, 17 April 2012, Section 5.1.3.1.

technological developments only in terms of changes in MEA, the Commission should note that such developments may encompass less radical advancements as well. Asset cost trends should encompass all these factors, and the tilt should be defined accordingly.

7.2 Taxation

The modelling proposed by the Commission is pre-tax, and then the tax adjustment made with the WACC. This approach implicitly assumes that the hypothetical efficient operator is not in a tax loss situation, however it is a common approach in LRIC modelling.

We also note that the Commission's tax adjusted tilted annuity would also assume that the operator is not in a tax loss situation.

For the avoidance of doubt, we recommend that the Commission make some explicit statement on the assumed tax situation of the hypothetical efficient operator.

7.3 Recommendations

We recommend the use of tilted annuity where there are trends associated with the costs of modelled assets. In regards to adjusting the tilt for changes in demand, this will depend upon the Commission's demand projections.

We also recommend that the Commission explicitly clarifies the assumed taxation situation for the hypothetical efficient operator.

8 Summary of recommendations

We recommend that the Commission:

- explicitly characterises the relevant operator construct as a hypothetical existing operator, deploying an efficient network using current lowest cost technologies most suited to the various areas in which it will supply services.
- applies a brownfields operating environment standard consistently in its modelling of the hypothetical efficient operator.
- for the purposes of cost allocation demand in the base year should represent Chorus' demand for copper and UFB access, and this demand will be served by fibre and FWA. The base year demand must exclude demand on other networks (HFC and non-Chorus LFCs).
- bases demand forecasts for subsequent years on an informed view of market dynamics, taking into account demographic, economic and competitive factors and using publicly available information wherever possible, to allow for transparency of the methodology and assumptions.
- models FWA using design parameters based on the latest available LTE release, so that it is deployed by the hypothetical efficient operator where it is efficient to do so.
- follows standard regulatory practice with relation to opex assumptions for TSLRIC models.
- disregards Chorus' 'cost escalation' methodology for assessing trends in opex as it is likely to lead to greater uncertainty and risk of bias, and indeed is unlikely to result in costs that reflect those of an efficient operator.
- incorporates cost trends in the model by including opex for a base year, and then applying a trend expressed as an annual percentage change in opex for the specified network element (rather than Chorus' approach which requires disaggregation of the network elements into multiple components).

- undertake a detailed efficiency study if minded to use the incumbent's actual costs as an input to opex assumptions, in order to ensure that the costs reflect those of an efficient operator.
- seeks further information from Chorus regarding the granularity of relevant information available from its service contracts, and Chorus' own expectations of the labour time involved in each of the regulated one-off service components.
- considers whether Chorus' proposal to add a margin to cover Chorus overheads in relation to service contracts is consistent with efficiently incurred charges
- does not apply for future transaction charges over the regulatory period any 'cost escalation' methodology without information on the duration and any provisions for cost trends in Chorus' service contracts, followed by an assessment of whether such provisions are reasonable.
- for the avoidance of doubt, makes an explicit statement on the assumed tax situation of the hypothetical efficient operator.