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

Final report for Spark New Zealand and Vodafone New Zealand, 25 August 2014

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Contents

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0 Executive summary

Chorus' claim that today's network operator would deploy a very small amount of aerial infrastructure in New Zealand is highly doubtful. There is significant existing third party aerial infrastructure in New Zealand that a hypothetical efficient operator would use in deploying a fibre network. Furthermore, it is clear that LFCs are using up to 60% aerial plant while currently in its UFB build Chorus is attempting to extend its own use of aerial plant.

Chorus suggests that overseas regulators assume very little aerial deployment in fixed access modelling but this is not supported by any evidence. In fact, contrary to Chorus' claims that no regulator assumes more than 16% aerial we found evidence that in urban areas up to 20% of infrastructure may be assumed to be overhead, while in rural areas up to 80% is assumed to be aerial. These assumptions are consistent with existing LFC practice in New Zealand.

The hypothetical efficient operator is the new Chorus, not a competitor to Chorus. As such the hypothetical efficient operator must be permitted to share existing civil infrastructure (with Chorus and third parties) where it is efficient to do so, and to locate civil structure where Chorus has located it previously. It simply does not make sense to develop an efficiency standard based on a hypothetical operator that is artificially more constrained than the regulated entity in the location of civil structure or obtaining access to existing structure on competitive terms.

Where existing poles are used, it should not be necessary for the Commission in its modelling to undertake a detailed area-by-area assessment of the compliance of hypothetical aerial deployment with local council requirements, as implied by Chorus. Rather, the Commission should assume that the hypothetical efficient operator would obtain a global certificate of compliance in each local area, as is current LFC best practice. Information is readily available on the existing overhead deployment percentages of lines companies by area. For modelling purposes, the extent of permitted aerial deployment for each global certificate could be based on this information.

1 Introduction

This short report considers issues relating to aerial deployment raised in 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].

This report addresses:

- issues raised by Chorus in relation to aerial deployment in New Zealand (Section 2)
- claims made by Chorus concerning aerial deployment in other countries (Section 3)
- the implementation of aerial deployment in the Commission's model (Section 4)
- recommendations for the Commission (Section 5).

Although this report has been commissioned by Spark New Zealand (previously known as Telecom New Zealand) and Vodafone New Zealand (Vodafone) the views expressed here are entirely our own.

2 Aerial deployment in New Zealand

On the proportion of aerial deployment that should be considered in the Commission's model, Chorus has stated

> The Commission should consider where an HNE [Hypothetical New Entrant] might deploy its network over poles (if cheaper), but any such assumptions should take account of the real world constraints associated with different types of deployment.

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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.

> At a high level, aerial deployment of a network seems like an attractive idea. However the real world experience is something different. Today's network delivering the regulated services comprises only a very small amount of aerial.[3]

In addition Chorus' consultant, Analysys Mason, has stated that 'it would not be reasonable… to assume the use of aerial deployment in locations where this is not consistent with local planning regulations'.[4] However network deployment by electricity distribution companies (which deliver regulated services to local areas throughout New Zealand) is dominated by aerial deployment. Exhibit 1 shows the percentage of underground and overhead/aerial circuit lengths for all the electricity distribution companies in New Zealand.[5] Clearly aerial deployment is a popular choice for distribution networks, with average deployment of over 70%. We expect that the existing infrastructure of distribution companies would certainly be an important consideration for a hypothetical operator deploying an efficient network to suit New Zealand's local conditions.

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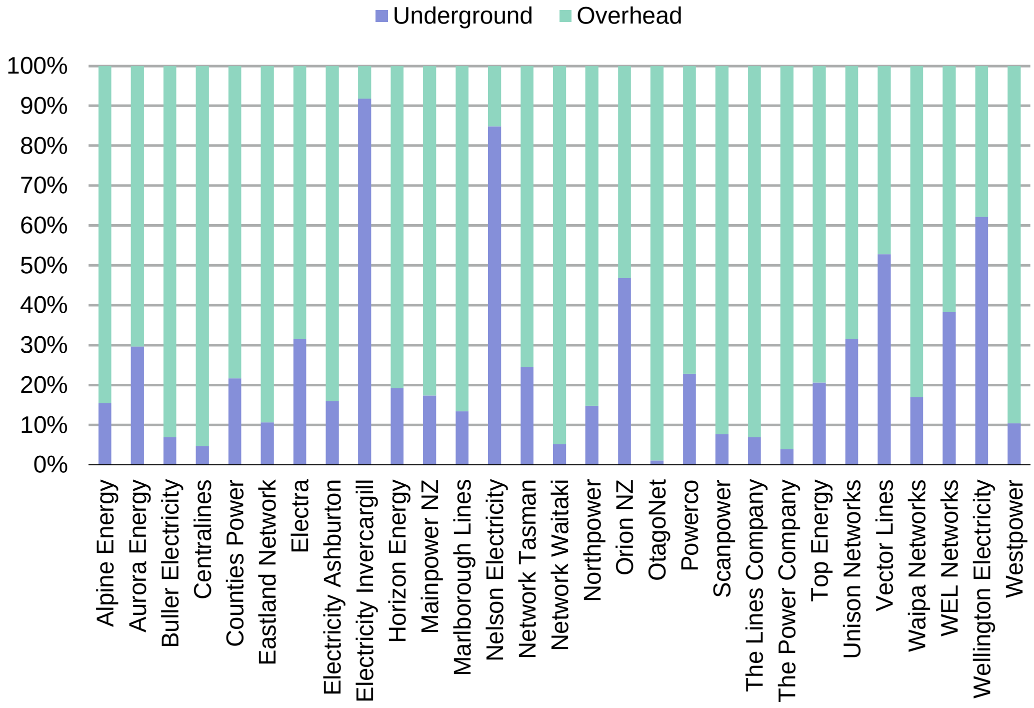
3 Chorus (2014), *Submission in response to the Commerce Commission's consultation paper outlining its proposed view on the regulatory framework and modelling approach for UBA and UCLL services (9 July 2014)*, 6 August 2014, paragraphs 59-60.

4 Analysys Mason (2014), *Response to Commission consultation on regulatory framework and modelling approach for UCLL and UBA,* 6 August 2014, Section 1.13.

5 Commerce Commission, *Electricity information disclosure*, available at http://www.comcom.govt.nz/regulated-industries/electricity/electricity-information-disclosure/.



Note: The percentages for all EDBs (except OtagoNet) refer to the information disclosed in 2013. The percentages for OtagoNet are based on data disclosed in 2012.

Exhibit 1: *Underground and overhead deployments for electricity distribution businesses in New Zealand [Source: Commerce Commission and EDB Information Disclosures]*

In regards to the UFB rollout Chorus has stated that aerial deployment is expected to vary between 0% and 60% for the different LFCs in New Zealand.

> … even in the case of Northpower it is predicted by one independent analyst that it will expend 40% of its capex on underground network (even though Northpower’s deployment is in an area in which local planning rules permit deployment of aerial distribution network). Goldman Sachs also estimated that other LFCs will underground between 60% (in the case of WEL Networks deployment in areas including Hamilton, Tauranga, New

> Plymouth and Wanganui) and 100% (in the case of Enable Services Limited deployment in Christchurch and Rangiora) of their networks.[6]

We have already noted in an earlier submission that Northpower's UFB deployment is 60% aerial and 40% underground and that utilisation of its existing electricity service infrastructure has resulted in a cost saving of more than 50%.[7] Chorus has stated in the above quotation that Northpower has not deployed a higher percentage of aerial installations even when it was permitted in the local planning rules. This is simply because it is most cost-effective for Northpower to plan its UFB rollout based on its current infrastructure – it deployed aerial fibre using the same poles as the electricity service lines and wherever the existing electricity lines are already underground, the fibre lines are installed underground.

WEL Networks is in a similar situation to Northpower as it has existing electricity service infrastructure and is expected to plan its UFB deployment based on that. As shown in Exhibit 1, 62% of WEL Network's current electricity circuit is overhead and hence it is also expected to have significant aerial deployment for UFB.

Crown Fibre Holdings has placed no restrictions on the proportion of aerial and underground deployments.

> UFB deployment along each street can be underground or aerial, depending on requirements in the District Plans for each Candidate Area.[8]

As discussed in our submission[9], in addition to being cost effective aerial deployments have other benefits which have been highlighted by the recent successful installations in Chorus' areas (such as Greymouth).

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6 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 65.

7 Network Strategies (2014), *Key issues in modelling UBA and UCLL services,* 6 August 2014, Sections 2.5 and 4.3.

8 Crown Fibre Holdings (2012), *Annual Report: For year ended 30 June 2012,* 26 September 2012.

9 Network Strategies (2014), *Key issues in modelling UBA and UCLL services,* 6 August 2014, Section 4.3.

> Chorus has today commenced work to deploy its ultra-fast broadband network in Greymouth, supported by local lines company Westpower.
>
> Chorus' General Manager for Infrastructure, Ed Beattie, said this is the first area where Chorus is deploying its fibre network overhead. "Westpower and Electronet share our views on the socio-economic benefits of ultra-fast broadband and have taken a very collaborative approach to working with us to bring fibre to their region as soon as possible.
>
> "The Greymouth fibre network will be a mix of underground and aerial cabling, and using Westpower's existing poles means we can minimise the disruption to the community that digging up roads and footpaths would otherwise bring," he said. "It also means we can get on with our deployment faster, and help ensure the community can get access to UFB sooner." [10]

We also note that on its website Chorus has stated that Resource Management Act restrictions can be addressed using hybrid cables for aerial installations.

> There are often Resource Management restrictions on aerial cables and we are not permitted to run an additional cable from the street into your house. Where we are delivering UFB to your house overhead via poles we may have to remove the existing copper wire but we will replace with a new hybrid cable which incorporates the new fibre connection and a copper cable as well.[11]

With successful installations and numerous benefits it is possible that UFB companies (including Chorus) might opt for even higher aerial deployment in the future than that previously planned.

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10 Chorus (2013), *Ultra-fast broadband on the horizon for Greymouth,* 17 December 2013.

11 Chorus, *What happens to the copper line when fibre is installed?,* available at http://www.chorus.co.nz/what-happens-to-the-copper-line-when-fibre-is-installed.

3 Aerial deployment in other countries

Chorus claims to have compared the percentages of aerial deployment considered in some TSLRIC models used in other countries:

> While Chorus is targeting 20% aerial deployment in its UFB areas, we haven't seen anything higher than 16% aerial in a TSLRIC model internationally. Norway used 9% and Portugal 3%.[12]

However Chorus has not provided any references to support its claim. We have not found any publically available data to confirm the stated numbers for Portugal and Norway.

Our research on Portugal revealed that the last LLU price determination was released eight years ago.[13] This Determination states that the 'model of forward-looking long-run incremental costs (FLLRIC) would be more appropriate when compared to the fully distributed historic costs methodology (FDHC)' but is not accompanied by details of inputs/aerial deployment. We note that in 2012 the Commission in its research for the UCLL re-benchmarking process received a response to its questionnaire on UCLL from the Portuguese regulator, stating that UCLL prices were based on a top-down historical cost approach rather than a bottom-up LRIC approach and that prices were available in reference offers. LLU pricing in Portugal still appears to be based on reference offers[14] and we assume the same top-down approach has been applied.

Even for Norway Chorus' quoted value of 9% does not apply to the whole country (and possibly might have been stated in reference to a particular urban area). Norway's publically available fixed LRIC model was created by Analysys Mason for the Norwegian Post and Telecommunications Authority (NPT).[15] The model applies input percentages of

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12 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 59.

13 ANACOM (2006), *Determination of ICP-ANACOM regarding prices of the local loop unbundling to enter into force as from 01.01.2006*, 13 April 2006.

14 See, for example, Portugal Telecom (2013), *ORALL Oferta de Referência Para Acesso ao Lacete Local*, 27 August 2013., available at http://ptwholesale.telecom.pt/GSW/PT/Canais/ProdutosServicos/OfertasReferencia/ORALL/Orall.htm.

15 Analysys Mason (2012), *NPT's fixed long-run incremental cost model*, 28 September 2012.

10-20% for urban and 35-50% for rural areas (depending on the cable type) to candidate routes for aerial cabling. The model then calculates the proportions of aerial tube metres for each of the 16 geotypes (Exhibit 2).[16]

Geotype	*Class*	*Percentage of tube metres assumed to be aerial*
Geotype 1	Urban	19%
Geotype 2	Urban	18%
Geotype 3	Urban	18%
Geotype 4	Urban	17%
Geotype 5	Rural	42%
Geotype 6	Rural	41%
Geotype 7	Rural	40%
Geotype 8	Urban	19%
Geotype 9	Urban	17%
Geotype 10	Urban	17%
Geotype 11	Urban	16%
Geotype 12	Rural	41%
Geotype 13	Rural	38%
Geotype 14	Rural	38%
Geotype 15	Rural	36%
Geotype 16	Empty	–

Exhibit 2: *Percentage of primary and secondary distribution tube metres assumed to be aerial by geotype [Source: Analysys Mason's fixed LRIC model for NPT]*

In addition we have found that some fixed LRIC models assume much larger values for the ratio of aerial to underground deployment. For example Eastern Caribbean Telecommunications Authority (ECTEL) has assumed an aerial cable proportion of about 60% in its Fixed LRIC Model for the Member States.[17] The Model Manual states that:

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16 Analysys Mason (2012), *Access network module for NPTs' fixed LRIC model v1.7*, 28 September 2012.

17 ECTEL, *Bottom up Fixed LRIC Model*, available at http://www.ectel.int/.

> a new build would most likely have a greater proportion of aerial cables to underground cables than the existing incumbent has in practice.[18]

Another example is of a study performed by WIK Consult for ECTA for determining access charges.[19] The study is based on a hypothetical country representing a 'typical European country'. For modelling and analysis, the different geographical areas in the country are classified into clusters based on the density of population.

> For purpose of this study we did not want to model a specific European country but chose settlement structures which are typical in European countries. We designed a hypothetical country for approximately 22 million households and business users or a population of around 40 million inhabitants…We have defined 8 clusters (geotypes), each having typical structural access network parameters derived from detailed geo-modelling of access networks in several European countries on a nationwide basis. The geotypes [*sic*] characteristics rely on concrete data from several countries.
>
> The clusters are mainly used to consider the cost differences due to the different geographic and settlement information. We use cluster-specific individual input data for access network structure input data, for construction cost and for deployment methods (e.g. underground ducted, buried or aerial cabling). The main cluster-specific values are the construction cost of ducts/cables, manholes, sleeves and aerial cables and the inhouse cabling. Construction costs are highest in the densely populated areas, while aerial cabling is used to a larger degree in the rural areas.

The proportion of aerial deployment in the clusters is assumed to vary from 0% in dense urban areas to 60% in rural areas (Exhibit 3). The weighted average for aerial deployment in the whole country is 34% (calculated using the share of customers). We understand from WIK that the data used in this study was based on questionnaire answers of operators and / or national telecommunications associations.

18 ECTEL (2008), *Draft Manual for the LRIC Models of the Fixed and Mobile Telecommunications Networks for the ECTEL Member States*, June 2008.

19 WIK-Consult (2011), *Wholesale pricing, NGA take-up and competition*, 7 April 2011.

Geotype	Cluster ID	Potential customers per km^2	Share of total customers	Aerial share
Dense urban	1	4000	8%	0%
Urban	2	1600	10%	0%
Less urban	3	800	12%	10%
Dense suburban	4	470	9%	20%
Suburban	5	280	11%	30%
Less suburban	6	150	14%	40%
Dense rural	7	60	20%	60%
Rural	8	< 60	16%	60%

Exhibit 3: *Structural characteristics and aerial deployment for different geotypes [Source: WIK-Consult]*

Finally we note that in the LRIC model created by Deloitte Business Consulting to calculate the costs for LLU in Romania[20] the percentage of aerial deployment is assumed to vary from 35% to 100% for different geotypes and networks (Exhibit 4).

Geotype	Share of total area	Share of aerial deployment		
		Main network	Distribution network	Drop wire
Municipality	4%	35%	75%	95%
Town	9%	35%	65%	100%
Commune	87%	65%	80%	100%

Exhibit 4: *Percentage of aerial deployment (on concrete and wooden poles in Romanian LLU model [Source: Deloitte Business Consulting]*

4 Implementing aerial in the Commission's model

Chorus commissioned resource management consultants, Incite, to consider 'the likelihood of an HNE [hypothetical new entrant] obtaining all necessary approvals under the RMA to

20 Deloitte Business Consulting (2010), *LRIC Model for Local Loop Unbundling and Operator Access Links services in Romania*, February 2010.

deploy a FTTH aerial network throughout New Zealand'[21]. Chorus summarises the findings of the author of the Incite report:

> Based on his experiences to date with leading Chorus' RMA consent programme for UFB, in his opinion the best approach for a new operator to consent a new aerial network would be to limit it to areas where there are already existing aerial networks (e.g. electricity lines networks) that can be utilised;
>
> Seeking to deploy a completely new aerial lines network would, in his view, not be practical, as it would be unlikely to be granted resource consents[22]

Given Incite's advice together with Chorus' assumption that the hypothetical efficient operator would not have access to Chorus poles, Chorus concludes that the opportunities for the hypothetical operator to deploy aerial plant are limited.

As we have already noted[23], the hypothetical efficient operator is the new Chorus, not a competitor to Chorus. As such the hypothetical efficient operator must be permitted to share existing civil infrastructure (with Chorus and third parties) where it is efficient to do so, and to locate civil structure where Chorus has located it previously. It simply does not make sense to develop an efficiency standard based on a hypothetical operator that is artificially more constrained than the regulated entity in the location of civil structure or obtaining access to existing structure on competitive terms.

Chorus admits that its own experience in fibre build is limited to urban areas[24], however as noted by Incite[25] aerial deployment is generally permitted in rural New Zealand and LFC

21 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 376.

22 *Ibid*, paragraph 377.

23 Network Strategies (2014),*Cross-submission for consultation on UCLL and UBA FPP regulatory framework*, 20 August 2014. See Section 2.

24 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 375.

25 Incite (2014), *RMA Analysis report, Fibre to the Home (FTTH) Aerial Network for a Hypothetical New Entrant*, 31 July 2014.

experience illustrates that it is feasible to obtain 'global' certificates of compliance for aerial deployment in local authority areas:

> In our experience, most district plans have been developed on an assumption that there will be incremental additions to existing overhead infrastructure networks. However, a new, wide-scale overhead lines network is generally not anticipated, at least within urban areas. There is a more permissive regime in rural zoned parts of some districts, although we note that in many instances factors such as outstanding landscapes may remove any permitted status applying to rural areas more generally[26].
>
> Given there is the potential for high public interest and or Council resistance to deploying aerial networks (even where on existing poles), and often district plan rules are poorly drafted and open to different interpretations, it is our view that where aerial deployment is assessed as being a permitted activity, it would be prudent to seek 'global' certificates of compliance in each local authority area for the extent of aerial works proposed. This has been the strategy followed by Chorus to date for its aerial UFB programme, and we understand the other UFB providers have followed a similar strategy[27].

With respect to potential new aerial deployment Chorus' resource management consultants indicate that both undergrounding and aerial deployment proposals may be equally constrained in some circumstances in readily obtaining local authority consent.

> Activities within some overlays (e.g. those for view protection) may make it more difficult to obtain consent for aerial networks. Conversely, they may make undergrounding proposals more difficult (e.g. where natural or cultural features or areas of interest have a high degree of protection)[28].

Consequently the Commission should adopt a conservative approach and assume that in such instances aerial is no more constrained than underground deployment.

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26 *Ibid*, page 5.

27 *Ibid*, page 14.

28 *Ibid*. page 5

Finally, Chorus raises doubts as to the capacity of existing poles for bearing additional fibre cables:

> The addition of fibre cables to pre-existing copper and electricity cables causes additional stresses upon pole structure, and can compromise stability. This is particularly true where poles are required to carry the weight of distribution cables (rather than service leads). In certain areas with older equipment or poles designed for service leads and not distribution, poles may not be structurally capable of bearing the weight of extra cables[29].

However the Commission should note that typically fibre cables are smaller in diameter than copper cables, and as such have significantly less weight, even compared to a three phase power line. Thus the addition of a fibre cable has far less impact on pole construction than an additional power cable. Furthermore, since fibre cables and the transmission of telecommunications signals are not sensitive to electromagnetic interference with fibre cables it is now possible to use the same distribution facilities in close proximity to power installations without any additional shielding of the telecommunications lines. In the past the situation was quite different in that copper pair telecommunications access lines were susceptible to major interference problems from the parallel pairs themselves and from any additional external source such as power lines. Consequently, in principle fibre cable could simply be attached to a power cable, although for operational reasons it would normally be fixed to the poles separately.

5 Conclusions and recommendations

We conclude that there is significant existing aerial infrastructure in New Zealand that a hypothetical efficient operator would use in deploying a fibre network. Consequently Chorus' claim that today's network operator would deploy a very small amount of aerial infrastructure is highly doubtful. Furthermore, it is clear that LFCs are using up to 60% aerial plant while Chorus itself is currently in its UFB build attempting to extend its own use of aerial plant.

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29 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 385.

As regards overseas precedents in fixed access modelling, Chorus' attempt to demonstrate that regulators assume very little aerial deployment is not supported by any evidence. In fact, contrary to Chorus' claims that no regulator assumes more than 16% aerial we found evidence that in urban areas up to 20% of infrastructure may be assumed to be overhead, while in rural areas up to 80% is assumed to be aerial. These assumptions are consistent with existing LFC practice in New Zealand.

The Commission should assume that the hypothetical efficient operator is able to access the existing poles of Chorus and of other third parties in deploying its network. Where existing poles are used, it should not be necessary for the Commission in its modelling to undertake a detailed area-by-area assessment of the compliance of hypothetical aerial deployment with local council, as implied by Chorus. Rather, the Commission should assume that the hypothetical efficient operator would obtain a hypothetical global certificate of compliance in each local area, as appears to be current LFC best practice. The extent of permitted aerial deployment for each global certificate could be based on the existing overhead deployment percentages of lines companies by area (as illustrated in Exhibit 1).