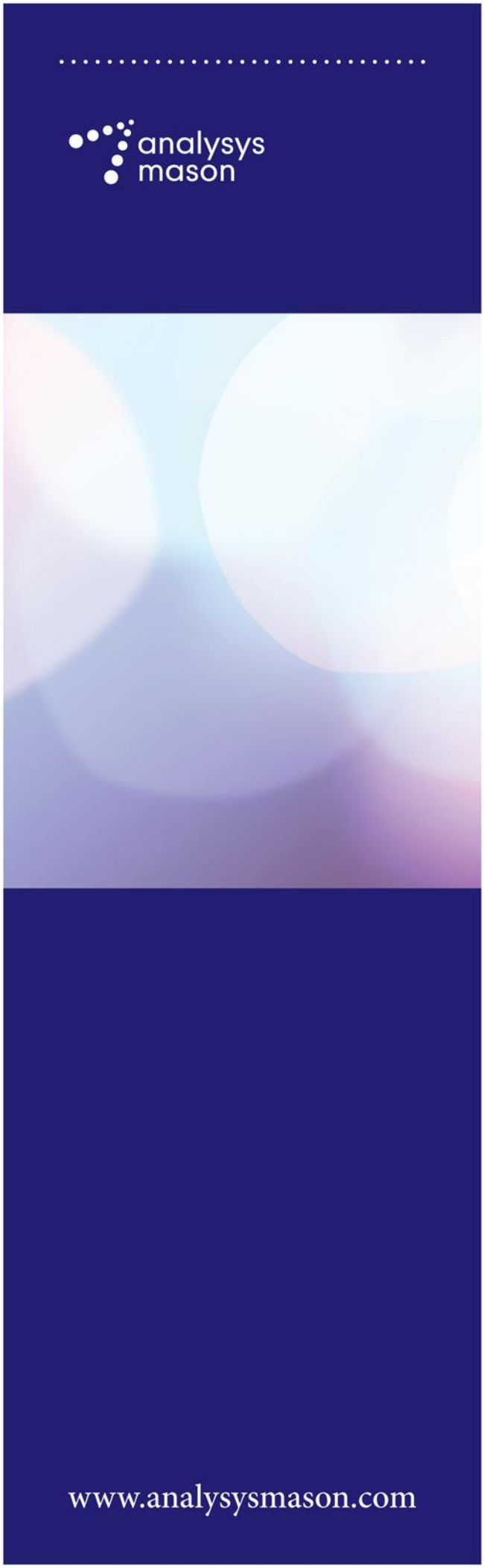

Report for Chorus

Paper in support of UCLL cross-submissions

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Contents

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1 Response to specific issues raised by industry submissions

As a result of requests from industry parties, the New Zealand Commerce Commission (NZCC) ("the Commission") is currently engaged in a process to set the price of unbundled copper local loop (UCLL) using the final pricing principle (FPP). At the same time, the Commission is also engaged in a process to set the price of unbundled bitstream access (UBA) using FPP.

This document has been written by Analysys Mason for Chorus, and is in response to the industry's submissions on the Commission's UCLL initial process and issues paper.[1] These papers set out a number of positions and answers to a number of questions, some of which are addressed in this document.

The remainder of this document is divided into a number of sections which cover the following specific issues:

- Nature of the modelled operator
- Existence of and importance of the LFCs
- Alleged natural monopoly
- MEA
- Loss of demand to non-Chorus LFCs not addressed
- The distinction between "Re-usable assets" and other assets
- Adjustments to unit costs of non-copper MEA
- Use of depreciated replacement cost
- Use of optimisation and valuation at depreciated replacement cost
- Miscellaneous other items

Note: Referencing into the Telecom document requires a means of distinguinging two sets of paragraph numbers. By 15q89 below we mean "para 89 in the answer to question 15".

1.1 Nature of the modelled operator

At 15q85 and 16q89 Telecom argue for "a hypothetical new access network with the same scale and service scope as Chorus's access network but optimised to some extent for efficiency and expected future demand". This is very similar indeed to our position, but somewhat different to that of Frontier (which seeks to reuse a subset of old assets at prices based on DORC).

By saying "the same service scope as Chorus network" Telecom is being inconsistent in relation to their own position on whether the TSO service set needs to be supported (30q146/7).

[1] New Zealand Commerce Commission Friday 6 December 2013 *Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop service in accordance with the Final Pricing Principle*, at http://www.comcom.govt.nz/regulated-industries/telecommunications/standard-terms-determinations/unbundled-copper-local-loop-service/ucll-final-pricing-principle/

Finally, this definition of the modelled operator is inconsistent with Telecom's proposition (42q180) that Chorus (which is providing what Telecom wishes to model and is directly subject to the exact conditions of New Zealand regulation) is not a comparable company to the modelled operator for estimating the WACC:

> The level of difference between Chorus and the modelled hypothetical network operator are such that Chorus will not represent a suitable comparator firm.

The reason we disagree with this position is that the only apparent difference between Chorus and Telecom's hypothetical is the extent of optimisation and efficiency adjustments. However, the WACC is about the financial market's view of the modelled entity, including the impact of regulation. Far from being an unsuitable comparator, Chorus is the best available comparator for the purposes of setting the WACC because it is providing the same services and is directly subject to New Zealand regulation - including the hypothesised optimisation. We note that Frontier explicitly considers Chorus "the only possible local candidate".

1.2 Existence of and importance of the LFCs

The selected TSLRIC methodology will play a key part in determining the difference between the future UCLL price and the LFC price. In order to encourage efficient investment in new services (i.e. those provided by LFC), the Commission should take great care in any situation where the industry parties recommend using an approach that is not consistent between old and new assets (e.g. the extent to which existing but "reusable" assets that are unlikely to be replicated should be valued differently).

The aiming point of this approach is much like that discussed in Telecom 10q73

> "This maintains competitive neutrality for access provider and for and among access seekers and allows copper and fibre to compete on their relative merits for the long term benefit of end-users. "

Our proposed approach, of costing the service based on the replacement cost of building and operating the network today, is entirely consistent with the existence of the LFCs and allowing copper and fibre to compete on their merits.

Build/buy incentives

The build/buy - incentives for investors are important, specifically for the investors in the LFCs. Frontier say (p13):

> For instance, if a regulator focuses on making the most efficient use of existing assets, it is more likely to choose a modelling approach that recognised that the cost of much of the infrastructure used to provide the service is sunk. Accordingly, they are more likely to use some kind of building block regulatory model to set prices for access to the service, and set the opening value of the regulatory asset base equal to the depreciated historic cost of the assets in the network. From there, allowed regulated revenues include recovery of the remaining undepreciated value of the network assets via future depreciation payments, and any future prudent capital expenditure can be "rolled into" the asset base. **Such an approach, however, would likely be in conflict with creating efficient build/buy incentives for potential new entrants, if or where efficient entry is feasible.** This is because the cost of the service is estimated by focusing on allowing investors to recover the costs of existing infrastructure – and not on the costs of building a new efficient network today. (Emphasis added)

The existence of the LFCs and the need to preserve the investment incentives for the investors in the LFCs does mean that the Commission is right to consider the costs of building a new efficient network today.

As a result, we think that Frontier rejects "build or buy" too strongly when it says *"There is increasing recognition today, however, that large parts of the access network may never be duplicated"*. This may be true elsewhere, but it is not true in New Zealand.

By comparison, Telecom e.g. Telecom 9q58, omits the incentives on the LFC investors.

Frontier also acknowledge (footnote 9) that the alleged disincentive to investment in new network arising from pricing copper services at replacement cost may not in fact change Chorus' behaviour in LFC areas due to the existence of the LFC roll-out targets. However in noting that *"These incentives are still likely to be relevant, however, in non-UFB areas that remain in Chorus' network.",* they do not acknowledge that even beyond the LFC areas, there is investment occurring in enhancing the capabilities of the network, for example as a result of the Rural Broadband Initiative (RBI).

Vodafone also emphasise the importance of correct "build or buy" entry incentives whilst discussing the scope of the UCLL at para C6.5

> "…with the resultant risk of encouraging inefficient (or discouraging efficient) entry. These outcomes would be inconsistent with the promotion of competition under s 18 of the Act".

We note that prices based on the replacement cost of a new network are those that would encourage efficient entry.

Telecom argue e.g. Telecom 3q14 that the use of a replacement cost methodology will lead to windfall gains[2]. See also our comments at section 1.8 below. However, Telecom do not recognise (as Frontier do, above) that there can be a conflict between incentives to promote efficient market entry and investment (by new access network builders) and return on investment for past access providers. Also, concerns about over-recovery are just as "backward looking" as the backdating they criticise at Telecom 6q29.

1.3 Alleged natural monopoly

The submission of Telecom has an inconsistent position, claiming that the Chorus network is a "natural monopoly" (Telecom 17) but also discussing the existence of fibre and mobile broadband (Telecom 15a). The LFCs, the HFC cable TV network, and the existence of mobile networks all point to the existence of competition and no natural monopoly.

Vodafone also claims Chorus is a natural monopoly (D5.1b) but (again) notes and discusses the existence of non-Chorus LFCs, which is inconsistent.

1.4 Loss of demand to non-Chorus LFCs not addressed

Due to the existence of competing LFC networks as well as mobile broadband networks, demand for the modelled operator will fall over time.

The impact of lower future demand levels for the modelled network in non-Chorus LFC areas is not discussed by Telecom (see e.g. 16q92). This point is discussed briefly by Vodafone at D1.4, but their conclusion is at odds with their own presentation of the evidence: Chorus only has 69.4% of the UFB, and as a result migration to non-Chorus LFCs will decrease demand for Chorus services. It is a key part of the issue with treatment of demand, because it means that an assumption of constant demand is not realistic.

Frontier notes that if the MEA is copper and fibre (Frontier p37) then for assets that will be re-used, the impact of demand changes over time on the cost allocation to the different services can be minimised (if the total demand – the sum of the two service demands - is constant) by an allocation approach that seeks to allocate an equal amount of the annualised reused asset cost to each end customer. This approach to cost allocation between copper and fibre services using the same assets – effectively allocating a per-end-user cost rather than a per-unit-cross-section cost - is interesting and not without merit. However, the approach of ignoring future changes in demand fails as the fibre customers will not all be on the modelled operator's network.

Therefore ignoring future changes in demand is not a tenable position if modelling an operator of the scale and scope of Chorus (or indeed any hypothetical New Zealand operator: no operator is the LFC in all LFC regions).

[2] Telecom do not note the possibility of windfall losses arising from optimisation; Frontier do

The European Commission also notes[3] that loss of subscribers to alternative infrastructures needs to be taken into account.

Rising unit costs do not necessarily lead to over-recovery

Telecom say (16q90):

> Relatedly, Neumann and Vogelsang (2013) suggest that the loss of economies of scale with falling copper demand would lead to higher access charges (if full cost recovery is taken as a given), which results in incumbents over-recovering their investments.

This is not correct. The increasing cost of copper under falling demand in straight line, annuity or other similar depreciation methods does not lead to over-recovery[4].

As we have previously noted in our submission, increases in the unit cost over time due to declining demand are not necessary if using economic depreciation or demand adjusted tilted annuity (in effect, both of these would set a stable[5] but slightly higher unit cost, to compensate for the lower average utilisation of the assets over time). We note that have already dealt with this issue in our UCLL submission response in the section titled "Reducing demand need not lead to an 'inflationary volume effect'".

1.5 MEA

Vodafone implicitly agree with our definition of the MEA as the technology which meets the requirements at the lowest cost (in NPV terms) in Vodafone E4.3 *"To meet this requirement, pricing achieved using the MEA must be at least lower cost than the current cost of service provision"*. They also suggest modelling both P2P and PON and allowing the model to determine the efficient extent of the use of FWA, again implicitly choosing between these options on the grounds of the least cost to meet the specification. We note that modelling multiple technologies will be time consuming and expensive.

Telecom support Frontier 's multiple possible MEA choices, but also suggest use of FWA without offering any evidence that it can actually provide the required features of UCLL (e.g. Telecom 17q95). Vodafone also place considerable weight on FWA (e.g. Vodafone recommendation 19), again without showing that it is able to meet the requirements of UCLL.

We have already made our views on the MEA known.

[3] See recital 39 of the 2013 European Commission recommendation.

[4] Stating the argument clearly ("full cost recovery leads to over-recovery") ought to be enough to refute it. Depreciation methods that have expected NPV neutrality do not lead to over-recovery - by definition. The result of those methods can be unit costs which vary over time, but the fact that the unit cost varies over time does not change the expected NPV neutrality.

[5] Allowing for asset price trends

Vodafone's arguing for FWA as the MEA in rural areas is also inconsistent with Vodafone's position that fixed-mobile substitution will not "materially affect the demand profile for the UCLL TSLRIC model" (Vodafone D1.11). They cannot have it both ways: either point to multipoint wireless technologies can be used to meet some end user needs, or they cannot. For the avoidance of doubt, we say these technologies can meet the needs of some voice only and low-end broadband customers (affecting total demand for the modelled operator's loops), but that point to multipoint wireless is not capable of providing an input equivalent to UCLL.

Telecom presents the European Commission (EC) position on the MEA as PON (Telecom p2), but the EC position includes FTTC too[6]. It should also be noted that EC recommendations are not binding. More widely, the European Commission 2010 recommendation[7] allows differentiated approaches to pricing *"where duplication of the relevant NGA access infrastructure is economically feasible and efficient"* – and this is exactly what is happening in New Zealand in areas where the LFCs and Chorus' FTTC network overlap. Where necessary, cables, trenches, ducts and poles are being replicated in those areas.

We believe Telecom is wrong to say that the choice of MEA should not be constrained by existing service definitions (Telecom paragraph 12). This is inconsistent with their own definition of the hypothetical operator discussed in section 1.1 above.

We agree that some of the TSO characteristics can be met by other technologies at additional cost, as in Telecom 30q147. However Telecom's wish (Telecom 30q147) to get access to a copper network that can provide the TSO but without Chorus being able to charge them the efficient costs of providing this capability is surely not an approach that promotes efficient investment or the long term interest of end users.

1.6 The distinction between "Re-usable assets" and other assets

The concepts of "Re-usable assets" and "assets that will not in practice be replicated" are distinct in New Zealand. Ducts and poles could be re-used, but will also be replicated in some LFC areas; as a result replacement cost would be an entirely fair way for them to be valued today. The European Commission 2013 recommendation[8] only concludes that depreciated valuation is appropriate because "the build option is not economically feasible for this asset category" (recital 35). The LFCs prove that it is feasible.

Trench with duct can be reusable if there is spare capacity in the duct. However, trench (with no duct) is not a reusable asset, and so when Frontier say "ducts and trenches" this should be understood only to mean "ducts and the trenches containing ducts".

[6] See for example COMMISSION RECOMMENDATION of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment, recital 32 and recital 40

[7] COMMISSION RECOMMENDATION of 20 September 2010 on regulated access to Next Generation Access Networks (NGA)

[8] COMMISSION RECOMMENDATION of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment,

Telecom paragraph 27 is quite a clear statement, as it makes it clear that only the assets that are both reusable and unlikely to be replicated can be so treated.

> Under the recommended approach, reusable and unlikely to be replicated civil engineering assets such as ducts, trenches, poles should be valued at indexed depreciated historic cost.

Our position is that:

- trenches not containing duct are not reusable and
- the existence of the competing LFCs means that such a methodology has very limited potential applicability in New Zealand.

See also our comments below in relation to optimisation in relation to depreciated valuation and scorched node in relation to hypothesised re-use of assets.

Telecom footnote 14 is not sourced, and is not supported by any evidence (paraphrased, it is that assets which support value creating assets should be valued at historic cost). This use of historic cost is wholly inappropriate. Frontier make a similar claim (p15) that replacement cost valuation "allows Chorus to recover the capital costs of hypothetical infrastructure investments it has not made". The BEREC (ERG) quotation raised by Vodafone at E4.2 explicitly agrees with our position: *"for replacement cost valuation to be appropriate it is not necessary to expect that the asset will actually be replaced."*

1.7 Adjustments to unit costs of non-copper MEA

Vodafone's Recommendation 20 is seeking a cost adjustment to a non-copper MEA. As we have previously argued in our UCLL submission, such a cost adjustment is equivalent to costing a copper network.

Frontier and Telecom favour a value based adjustment based on (for example) willingness to pay. We have argued against this at length in our prior submission.

We note the argument of Frontier (p25) that FWA may be inferior to copper and that its performance adjustment might add to the unit cost as a result. We maintain our position that FWA would only be an acceptable MEA if it meets the required specification (and that FWA cannot amongst other issues meet the requirements for a layer 1 input or provide a non-blocking service able to provide the current service set in terms of speed and throughput). We also note that it is expensive to provide high levels of service availability (i.e. it should work all the time) and have ubiquitous provision (i.e. serve all homes, rather than (say) 95%) using fixed wireless technology due to the effects of weather, the screening of homes by vegetation, and (in particular) the effects of screening by terrain.

We note that Frontier also suggests (p25) that the result from a fibre MEA after adjustment should be at or below the "anchor pricing" approach (in effect capping the price at the TSLRIC of a

copper MEA). We have previously commented on the lack of "fair bet" properties of this cap (which is also discussed in the Neumann/Vogelsang paper[9]) in our UCLL submission.

1.8 Use of depreciated replacement cost

For the avoidance of doubt, we do not favour approaches using depreciated asset values and remaining lives, but favour a replacement cost valuation with full asset lives; this is consistent with the recent entry of the LFCs, the need to maintain investment incentives for the LFC investors, and (as a result) the need to reflect the true cost differences between services based on UCLL and LFC services by costing copper in a way that is consistent with the costs faced in building the LFC network.

The use of replacement cost valuation does not of itself lead to a windfall gain. This can be illustrated with a simple example. If using a flat annuity - no price trend for the asset (for ease of calculation: the point is still true with other methods), an asset costing $1M with an economic lifetime of 40 years and a WACC of 10% requires 40 annual end of year payments of $102.259.41 for cost recovery. The nature of a flat annuity gives a capital repayment (return of capital) which varies over time and the remaining (depreciated) asset value after 30 years is $628339.83. An asset valued at $628339.83 with a ten year remaining lifetime also requires 10 annual end of year payments of $102.259.41. In other words, the annualised cost need not change whether the valuation is a depreciated or a replacement cost.

1.9 Use of optimisation and valuation at depreciated replacement cost

Taking the above into account, we now look at whether optimisation can be combined with the use of depreciated asset values.

In the use of depreciation and optimisation, Telecom wish to have their cake and eat it: they are asking for depreciated current replacement cost for reusable assets that are not going to be replicated, but with optimisation and a new MEA (Telecom paragraph 23 et seq). Frontier does partly address the difficulty of estimating the depreciated cost of an optimised network (Frontier p36). However, the problem with their proposed approach (in essence, to apply the ratio between the expected remaining life and total expected life to the optimised network) is that the optimisation may lead to a totally different network: the assets they claim are partly depreciated today may well have been sunk by the optimisation (leading to windfall losses to Chorus) and will not be available in the right location to provide the future optimised service. Another way to put this is that if following such an approach, which for the avoidance of doubt we do not recommend, the entire class of reusable assets that are not going to be replicated cannot be valued in such a way but **only the subset that are actually reused in the hypothetical optimised network could ever be so valued**.

[9] Neumann, Karl-Heinz; Vogelsang, Ingo (2013) : How to price the unbundled local loop in the transition from copper to fiber access networks?, 24th European Regional Conference of the International Telecommunication Society, Florence, Italy, 20-23 October 2013, section 4.4.4.

If reusing assets in this way, and using the depreciated costs, then it would also be unreasonable to apply efficiency adjustments to the operating costs of these (by definition, old) assets, if justifying these adjustments on the grounds that newer versions of the same assets would have a lower operating cost. To get access to the asset at the depreciated valuation it must of necessity be old.

Seeking to use depreciated valuations of reused assets is therefore fundamentally inconsistent with Telecom's (and Frontier's) position of modelling a "scorched node" network retaining only the MDFs but not the cabinets. Indeed, minimising the bottom-up network cost in a network reusing the existing reusable assets would need to start from the actual reusable asset locations (i.e. a scorched node approach retaining duct, poles, cabinets, and MDFs). Otherwise the optimisation is likely to make different choices (where to locate the duct, which routes to run cables, etc) and the depreciated "reusable" assets that are not going to be replicated will not be available to use in the required location. **The use of optimisation and use of depreciated asset values are inconsistent unless the actual locations of the assets and the ability to reuse them are taken into account.**

Vodafone's proposal of "flat annuity" for reused assets does not acknowledge:

- that demand for those assets will be changing over time (notably, the number of end customers connected will be lower in areas where Chorus is not the LFC, as noted elsewhere in this document),
- the fact that the replacement cost of those assets is known to be varying over time (which means that tilt is required),
- the risk of stranding of those assets by future technological developments.

This is inconsistent with the proposal of Frontier, who discuss replacement cost trends and the risks of optimisation on page 10, quoted below, and recommend tilted annuity.

By comparison, Telecom's proposal of tilted annuity and assessment of the factors which need to be taken into account in Telecom 37q168 is more realistic, though we retain our position in favour of economic depreciation.

Frontier (page 10) point out that optimisation creates specific risks:

> Re-optimisation of a network – and particularly the prospect of re-optimisation at future regulatory resets – creates considerable uncertainty for investors in telecommunications infrastructure and would not be likely to promote the objective of encouraging innovation and new investment in line with section 18(2)(a) of the Act. For instance, an access provider may fear that, over time, innovation may mean that the cost of MEAs declines over time. Accordingly, the cost base it is able to recover through access pricing would decline at each regulatory reset. **In the absence of any appropriate adjustment of the depreciation profile that allows for the recovery of the capital costs incurred by the access provider, the access provider faces the risk that constant re-optimisations of its network for cost modelling purposes will prevent it from ever being able to recover the actual costs it has incurred when building the network.** (emphasis added)

These risks are all good reasons for the use of depreciation methods and other related parameters such as economic lifetimes that take these future risks of re-optimisation into account in order to provide expected NPV neutrality.

Finally, while Frontier seems to be seeking a variant of TSLRIC with enhanced price stability – an approach which could be characterised as "half way to a building block model", proposing for re-used assets in effect a RAB into which prudent capex is rolled up (e.g. as expressed in Frontier page v), we note that Telecom generally supports the ability of TSLRIC costing to revisit major assumptions at resets (Telecom 2q9). We note that these positions are starkly different.

1.9.1 Inconsistency between past and future treatment of expenditures

There is an inconsistency in Frontier (and others who support the use of depreciated values for reusable assets that are unlikely to be replicated) asking for reusable assets to be valued and depreciated in one way in the past (by implication, using accounting depreciation, which is following the straight line approach that Frontier reject elsewhere in their paper, and with optimisation) but depreciated another way in the future (Frontier propose tilted annuity with no further optimisation for some assets and tilted annuity with potentially limited optimisation for others). If straight line depreciation is wrong in the future (because for example it seeks to recover large amounts of depreciation in early years when demand is low) it is also wrong in the past. So if using a depreciated valuation, then the depreciation needs to be calculated in a consistent way appropriate to the planned future depreciation method.

Further, why should investment in 2013 be treated differently to investment in 2015 as regards optimisation ? If no optimisation is appropriate for future capex (if future capex is somehow agreed to be "prudent"), why should past prudent capex be optimised away simply because it turns out with the benefit of hindsight that it was not prudent ?

1.10 Miscellaneous

1.10.1 EU target range of UCLL prices

Telecom (p3) quotes the narrow target range for EU UCLL prices, but does not acknowledge that many EU countries current prices are outside the range (e.g. Ireland).

The EU target is not the result of an objective cost model; it is a number that has been set by an essentially political process. It is our view that its target range is probably too narrow for the variety of local circumstances in play in the EU. Our view is based on previous unpublished and confidential work which was based on granular and detailed incumbent operator cost data in an EU state which indicated that the expected range in results between different member states (due to their differing geo-demographic spread of population) was wider than is actually observed. The fact that objective results could be wider than the target range can be seen from the fact that there are EU countries with current loop prices set by regulators using models which are substantially outside this range (e.g. Ireland which was EUR12.41/month when benchmarked by the

Commission[10], even though it excluded the costs on exchanges with fewer than 2500 lines, meaning that an "all loop" cost would be higher than this).

1.10.2 Scorched node – locations to retain

Frontier say (p21)

> Given that UCLL services will be delivered at the existing MDF sites, and hence the access seekers will be paying for the costs of the access network from these nodes to the end users' premises (and will pay for the backhaul from the MDF site to their core networks), we believe the MDF locations should be fixed in the bottom up model for the UCLL even if these are not the access nodes that would be used in an MEA network.

The exact same argument (which could be characterised as "keep the same service delivery sites") would lead to retaining the cabinet locations in relation to SLU pricing (which we expect will need to be determined in the same TSLRIC model as the UCLL). Outside the scope of UCLL, it would also lead to retaining the "first data switch" locations in a UBA model. We agree.

1.10.3 Minimum trench network is not the minimum cost network

On page 21, Frontier say

> "In doing so, the model should seek to minimise the overall length of the duct network (given that duct is the largest cost item in the access network).
> Cable routing through this minimum length duct network should aim to minimise the overall cost of cables and associated infrastructure and installation."

This is a fallacy. Despite the fact that trench (with or without duct) is much more expensive than cable, the minimum total cost network is not the same as the network with the minimum amount of trench, because the cost of the cabling needed can be much higher in a minimum trench network, and because there is often a maximum range constraint (cable distance from MDF to end user cannot exceed a certain value[11]) which means that the routing needs to be more direct to reach the edge of the MDF area[12]. The resulting trade-off means that the minimum total cost network is more "bushy" (has more branching closer to the MDF) than the more "straggly" minimum trench network.

10 Attachment A to Commerce Commission Final determination on the benchmarking review for the unbundled copper local loop service

11 This is a simplification in a copper network as the cable can use thicker copper, at extra cost, to increase range.

12 Put another way, less direct routing would need more MDFs