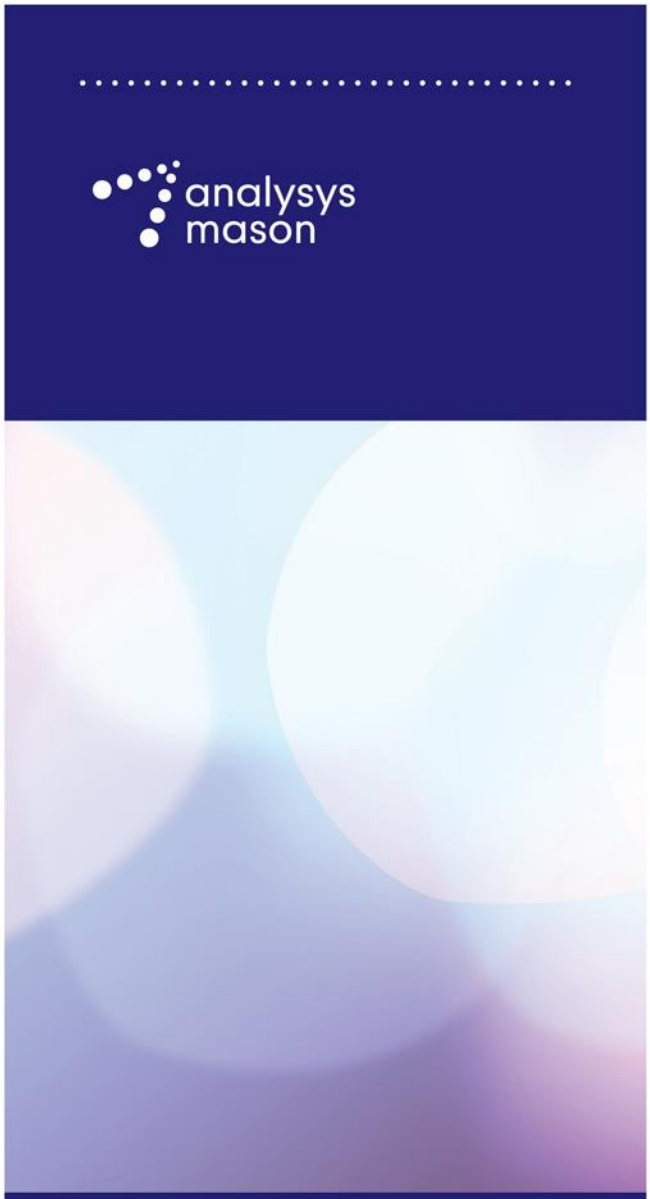

Report for Chorus

Response to Commission consultation on regulatory framework and modelling approach for UCLL and UBA

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1 Response to specific issues raised in the Commission's paper

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 Commission's July consultation paper.[1] That paper sets out a number of positions, many 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:

- Definition of incremental cost
- Forward looking / hypothetical new entrant
- Cross-check model to identify true lowest cost
- The service needs to be clearly defined before the technology can be chosen
- A layer 2 service is not a suitable input for an unbundler
- Alarms and faxes
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- Use of "operator strategy" as a means of selecting the MEA
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1.1 Definition of incremental cost

> 96.3 "Incremental costs" refers to the cost of supplying the service as an addition to Chorus' other services.

[1] New Zealand Commerce Commission 9 July 2014 *"Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services"*

This definition is inappropriate as it is Chorus-specific. The Commission is not modelling Chorus' incremental cost: it has chosen to model the incremental cost of a hypothetical operator.

Ofcom's 1997 definition[2] is operator neutral:

"Incremental costs include only the costs that are caused by the provision of a defined increment of output."

1.2 Forward looking / hypothetical new entrant

> 196. As discussed earlier in this paper, our MEA for UCLL will be based on the costs that a hypothetical network operator would incur if it built a new network asset today.

We agree that the Commission should model a hypothetical operator building a new asset in today's real world New Zealand conditions. We would characterise the operator as a hypothetical new entrant.

1.3 Cross-check model to identify true lowest cost

> "TERA recommends modelling two networks, a copper network and a FTTH/FWA network, and deciding whether or not to make a cost adjustment to our FTTH MEA depending on the results to identify the least cost… If the copper costs appears to be higher than FTTH/FWA cost, adjustments are not necessary and the UCLL price is set based on the FTTH/FWA cost. Our preliminary view is that we will adopt this approach." [180]

We support the Commission modelling of both a fibre network and a copper network, as long as both fully provide the required service functionality.

However, if the cost of a copper network is found to be lower than fibre, we believe an adjustment is not necessary. Rather, in that scenario, the lowest cost technology to provide the required service is copper, and so the MEA must be considered to be copper.

1.4 The service needs to be clearly defined before the technology can be chosen

The Commission's approach appears to be to seek an MEA capable of providing the service at the lowest cost. Defining the service to be provided - in the Commission's terms, defining this "core functionality" - is therefore critically important to the Commission's approach in selecting the MEA.

The correct approach would be to define the service to be offered before selecting the most cost effective technology to deliver that service (the MEA). This is directly supported by the Dr Every-Palmer quotation given by the Commission at paragraph 99:

[2] http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/pricing/pri1997/annexd.htm

> a. My understanding is that TSLRIC models attempt to determine "the costs that would be incurred by an operator using the most efficient means at any point in time to provide the service…

However, the Commission has not provided a clear definition of the required "core functionality".

The Commission described their own list of candidate criteria for the selection of the MEA in the Issues paper:

- Copper, including the question as to whether media conversion is required
- Layer 2 input
- Point-to-Point
- Passivity
- Services
- Power

We provided our own list (some of which overlapped) in response to that paper.

The Commission has in the process and issues paper discussed its initial position in relation to some of these criteria, but a final view is not clearly documented by the Commission. Importantly the Commission has not answered:

- Its own question on media conversion
- the arguments we made in relation to the fact that a Layer 1 service is fundamentally different to a Layer 2 service:
  - it is not possible to economically "unbundle" a layer 2 service in order to provide a competing layer 2 service (i.e. UBA cannot be used to compete with UBA)
  - the existing (physical layer metallic path) UCLL allows the use of other services beyond voice and broadband data (such as low speed dedicated capacity using SDSL or EFM[3] technologies, should an access seeker wish to do so)
- the arguments we made that wireless solutions cannot provide an economic non-blocking solution in which one user's throughput is unaffected by another's.
- the arguments we made that the criteria are not to be weighted, but are individually pass/fail items

The Commission has therefore not clearly stated or justified the "core functionality" which it says the MEA has to support (e.g. physical layer access dedicated to a single end user, minimum broadband data peak speed, minimum broadband data throughput per end user in the busy hour, nature of service set to be supported (e.g. broadband data, voice using existing CPE, fax using existing fax CPE, low speed modems using existing CPE such as Sky boxes and EFTPOS[4] terminals, alarms using existing CPE), and whether or not voice services should function during a power cut.

[3] Ethernet Final Mile

[4] Electronic Funds Transfer Point Of Sale

Instead TERA have used a much shorter list of characteristics:

- Layer 2 input. The UCLL MEA must enable access seekers to provide layer 2 and higher services
- Services. The UCLL MEA must be able to provide telephony (voice services) and broadband (via bitstream services) as the two primary services
- Point to point is "recommended" but only "where economically rational".

We discuss the inadequacy of a layer 2 input as a substitute for UCLL below.

The Commission has not stated whether the ability to support voice services in a power cut is required. We discuss alarms and fax below.

The "point to point" characteristic as described by TERA is not a valid criterion. Allowing a criterion to be relaxed subject to "Economic rationality" is not valid, because it implies that the criterion need not be met if it is expensive to provide. Given that selection of the MEA is already predicated on the technology being the lowest cost means of meeting the required "core functionality", "economic rationality" renders this criterion meaningless. Either point to point is a part of the required core functionality or it is not. It may be that if "point to point" is incorrect, one or more different criteria are required – we have already stated our views on the appropriate criteria in section 1.4.3 of our UCLL process and issues paper[5].

In summary, TERA's approach is not correct because it allows much cheaper and much less functional network technologies to be used to cost the provision of services that cannot be provided over such a network. In other words, the TSLRIC of a lesser service (one that does not meet all the "core functionality", in the Commission's own language) is not the TSLRIC of UCLL[6] and will not provide Chorus or access seekers with the correct investment incentives[7].

Instead the Commission decides upon using a new set of criteria for the UCLL MEA, based on balancing the following qualitative factors:

- Technological performance
- Cost
- Operator strategy
- Subscriber and retail price

This approach is not related to that put forward by the Commission in the process and issues paper.

[5] Analysys Mason Report for Chorus Response to Commission 12 Feb 2014, available at www.comcom.govt.nz/dmsdocument/11493

[6] It will not represent the "forward-looking costs over the long run of the total quantity of the facilities and functions that are directly attributable to, or reasonably identifiable as incremental to, the service"

[7] If the provider of UCLL were allowed to refuse to supply UCLL in higher cost areas, then the areas in which it did not supply UCLL could be validly omitted from the cost calculation. Indeed, UCLL is not provided for a very few Chorus end users e.g. those served by country sets. This is however not the same as allowing the point to point requirement to be contingent on "economic rationality"

On the basis of these factors, TERA concludes that the MEA for UCLL should be P2P FTTH and FWA in "less dense rural areas" (which are undefined).

1.5 A layer 2 service is not a suitable input for an unbundler

In the UCLL process and issues paper, the Commission says:

> 101.2 Layer 2 input. The ability for access seekers to provide a layer 2 (or higher) service is fundamental to the UCLL Service, and should therefore form part of the MEA selection criteria. Importantly, this leaves open the possibility of a layer 1 or layer 2 MEA.

The last sentence makes it clear that the position of the Commission is that a layer 2 service (which is broadly speaking comparable to UBA) is equivalent to a copper loop or subloop as provided by UCLL/SLU (or UCLFS, if the Commission intends to maintain a link to UCLL pricing). It is not. The simplest illustration is that if Parliament or other national regulatory authorities believed this to be the case, then there would be no need for separate regulation of UCLL as well as UBA[8]. The operators currently buying UCLL do so in order to attach their own electronics. In effect, they are choosing to build DSLAMs and to self-supply an equivalent product to UBA in order to compete with Telecom and others at the retail level. Their case for doing so was based on being in control of the electronics and able to choose the service peak speeds and data throughput themselves (rather than choosing from a price list set by Chorus and which formed a common input to all UBA-based retail ISPs). If the UCLL input is (in effect) UBA, then there is no longer a business case to be an unbundler, a point that we made previously in our process and issues paper[9]:

> However, a layer 2 service is not in our view a suitable input for an access seeker looking to install infrastructure to provide a service competing with that layer 2 service; whilst it is possible to provide layer 2 over layer 2, there is very little added value in so doing which means that the business case for seeking UCLL access is no longer present.

The Commission looks to the Swedish case as one in which the regulator has modelled a fibre MEA. Even here however, the assumption was that the FTTH modelled should be capable of being unbundled in the areas where LLU was currently provided (i.e. FTTH PON was excluded). As the PTS puts it in their model specification[10]

[8] For NGA, some regulators have used a remedy related to "virtual unbundling". However, they have not suggested that this is a suitable input for (for example) services to offer to voice-only customers.

[9] Analysys Mason Report for Chorus Response to Commission 12 Feb 2014, available at www.comcom.govt.nz/dmsdocument/11493

[10] http://www.pts.se/upload/Remisser/2014/bil-4-svensk-mrp-rev-c.pdf section 12.3.2. This is an Analysys Mason translation of part of section 12.3.2 (In Swedish). An earlier (2010) draft version of the same document with very similar wording which is provided by the PTS in English is available at http://www.pts.se/upload/Remisser/2010/Draft-MRP-2010-02-04.pdf

> For wholesale services in the access network, like e.g. LLU, the corresponding service should mirror what a wholesale customer would wish to acquire. This for example means that, in those areas where LLUB is offered, the bottom-up model should model an access network that can be used to offer access to the local loop. This can result in the exclusion of alternative technologies, such as PON, where effective access may not be possible (though it could become possible over WDM technology).

1.6 Alarms and faxes

In relation to alarms and facsimile, the Commission claims that these are "services based on legacy technology", that "reflect historic technology choices that have been made", and that alarm devices could be adapted relatively easily to work over IP (broadband) or GPRS (cellular) networks and that "the modern equivalent of a facsimile is an email attachment". These statements are not backed up by any analysis (for example, is it acceptable for customers with no broadband and no mobile coverage to have no access to alarms ?) nor are they necessarily relevant. It is not whether alarms can be "easily" adapted that is at issue: it is whether the costs of these adaptions should be considered part of the costs of the MEA.

We believe that the costs of such "adaptions" should be included in order to make a fair comparison of the costs. Loading some of the costs on to the end users or the wholesale buyers does not make the solution more cost-effective. The purpose of the FPP exercise is to determine the most efficient way to provide the defined service (UCLL). Redefining the service in such a way as to push the costs onto other parties (such as end users or the RSPs) does not demonstrate that the revised definition is a more efficient solution (lowest total cost), just that it reduces the costs carried by the modelled operator.

The Swedish regulator takes this view in their cost modelling[11], noting that

> No "external" costs should occur when a similar service is offered. This for example means that if fibre or radio are the MEA in the access network then the cost for the relevant CPEs (required to allow an end-user to use his analogue [PSTN] telephone) be included in the model.

1.7 FTTH (plus additional costs to support voice CPE) is a valid MEA if and only if it is cheaper than copper

The Commission submits that our paper claimed that "the only technology that can do so is the existing copper network".

However, we did characterise FTTH P2P with additional costs (battery backup and a suitable ATA) as potentially meeting most of the requirements, at least for customers requiring both voice and data services. These additional items (battery (cost say NZD 40 for a 1 hour duration when needed) and ATA

[11] http://www.pts.se/upload/Remisser/2014/bil-4-svensk-mrp-rev-c.pdf, section 12.3.2 (In Swedish)

(incremental cost say NZD 20)) are straightforward to add to an existing cost model; they are each simple assets with well-defined functionality and have trivial dimensioning rules (1 per customer).

For customers requiring voice services only, the required additions are greater: these customers also need a broadband CPE (which could incorporate the ATA), a port on the central electronics at the ODF location (e.g. Ethernet access switch), and a contribution to the operating costs of the broadband network. Only the operating costs would add material complexity; the other items are again simple assets with trivial dimensioning rules. However, very similar port costs and operating costs are currently being estimated by the Commission to calculate the TSLRIC of the additional costs of UBA. (These costs are not included in the UBA costing because they would be incurred in this case for voice only customers - who by definition do not buy UBA).

If the resulting unit costs in total were lower than for an equivalent copper network, then the MEA would be FTTH/P2P.

1.8 Use of "operator strategy" as a means of selecting the MEA

TERA place considerable weight on the technology choices being made by New Zealand operators. We believe that this "operator strategy" is not correct as a means of selecting the MEA, nor consistent with the choice of the most efficient technology to provide the UCLL and UBA services according to a specified list of criteria, which is the approach described by the Commission in the process and issues paper, e.g.

> 105. Accordingly, we intend to make a hypothetical assessment of the efficient cost today for an equivalent service, unconstrained by Chorus' (or end-users') historic technology choices, but capturing the "core functionality" of the regulated service.

The New Zealand operators are not operating in a greenfield scenario, as a new entrant influenced only by commercial considerations: this applies both to the LFCs and to the wireline and wireless elements of the RBI. They have existing assets such as duct, poles, and cables; government funding has been made available under specific conditions and providing specific constraints.

None of the LFCs nor RBI providers (other than Chorus) actually provides a service directly comparable to UCLL[12]; they are providing layer 2 or higher services where the product definition (e.g. peak downstream speed) is controlled by the LFC or RBI provider (which may also be constrained by the contract with the government). The per-user achievable throughput (e.g. kbit/s in the busy hour) offered to wireless-served RBI customers is also not as high as is currently offered on UBA in areas served by ADSL or VDSL technology.

Finally, none of these service providers is obliged to serve (in effect) all locations in New Zealand. Even in the RBI scheme, only 80% of premises in zone 4 are targeted for coverage, which means that there can and will be for example isolated homes not connected even within areas where wireless

[12] We understand that in future there may be unbundling at the splitter in the LFC networks; this is not directly analogous to UCLL

coverage may be available to many of their neighbours. Providing partial coverage using wireless means is much cheaper than full coverage; providing 100% availability (or even 99% availability) within New Zealand is much more expensive - to the extent that the supposed cost advantage of wireless methods can be entirely eliminated (and they can be more expensive than wireline as a result).

1.9 The RBI solution is a mix of wireless and DSL

The Commission has suggested that:

> 164. Our current view is that we will model FTTH, and at the edges of the network we will model FWA. Our approach to determining the edges of the network is to take the current, and projected, RBI fixed wireless footprint.[110]

This is not an appropriate means to select the technology to be used and its geographical extent.

Firstly, in effect, the Commission are using the current network situation to select the geography in which to use fixed wireless solutions. However, this is not consistent with the Commission's own rejection of arguments based on the current network configuration of existing operators (notably Chorus) e.g.

> 198. ….If we allowed the particular configuration of the existing network to govern our choice of MEA, then that might not meet the requirement to assess "forward-looking costs".

Secondly, the RBI fixed wireless footprint overlaps the existing Chorus copper/FTTC DSL network, an area in which therefore many voice and data connections are served using wireline means. To propose the exclusive use of wireless in that area is therefore not reflective of the actual use of network technology in those areas, nor of the relative cost efficiency of the solutions (wireless might have been a cheap way to provide in-fill high speed services to users with long lines on an existing copper network but might not be equally well suited in a green field situation at the required levels of capacity and customer density).

A consistent and principled approach would be to define the required service specification (or "core functionality" using the Commission's language) and then by modelling to find the lowest cost means of delivering that service specification in different areas using a model of specific technologies each deployed homogenously in a given area (e.g. copper, FTTC, FTTH, wireless) or using combinations of technologies deployed in a given area (e.g. copper + wireless).

We have detailed at length why wireless solutions cannot provide equivalent functionality to UCLL in our submission on the UCLL process and issues paper[13]. (Section 1.4.8, "Wireless" subsection).

[13] Analysys Mason Report for Chorus Response to Commission 12 Feb 2014, available at www.comcom.govt.nz/dmsdocument/11493

PTS do model FWA for the 50k most rural households in Sweden. However, as noted above, they say[14]:

> "This for example means that, in those areas where LLUB is offered, the bottom-up model should model an access network that can be used to offer access to the local loop."

Accordingly, PTS is ensuring that where "LLUB is offered" FWA is not used; it is only used in the last 50k homes, which is an area in which there is no broadband demand in the model (and comparable to the number of lines with no existing ADSL offer). We have previously documented[15] that TeliaSonera has a plan to use wireless to serve approximately the same number of homes. In New Zealand the equivalent in my opinion would be to exclude lines which are currently served using baseband remote from the geographical scope of UCLL.

Other European regulators do not cost FWA as the MEA for LLU.

1.10 UBA: elimination of double recovery

TERA proposes to eliminate "double recovery" of the fibre feeder to DSLAMs located in cabinets.

> If UCLL and UBA do not have the same MEA, double recovery should be identified and removed. The identification of the double recovery will be conducted by comparing the network architectures and footprints in both cases (UCLL and UBA) to identify overlaps. In particular, if fibre is chosen for UCLL and copper/FTTN for UBA, then the core network UBA cost should be reduced by the amount of the network between the MDF and the active cabinet, for those areas where MDFs are cabinetised.

This apparent double recovery is not real, and does not need to be removed. The reason the Commission has selected a different MEA for UBA (Ethernet-based DSL on copper) is that.

> …for the UBA service, the existing copper network must be taken as a given, and the TSLRIC and MEA principles only be applied in relation to the facilities associated with the "additional costs".

The UCLL copper network that is a "given" does not have a fibre feeder[16], so there is no double recovery.

A competing operator choosing to build its own cabinet DSLAMs will buy SLU and will need to either build fibre to the cabinet or buy sub-loop backhaul. As the Commission states:

[14] http://www.pts.se/upload/Remisser/2014/bil-4-svensk-mrp-rev-c.pdf, this is an Analysys Mason translation of part of section 12.3.2 (In Swedish). An earlier (2010) draft version of the same document with very similar wording which is provided by the PTS in English is available at http://www.pts.se/upload/Remisser/2010/Draft-MRP-2010-02-04.pdf

[15] Section 1.4.2 of our submission on the UCLL process and issues paper, Analysys Mason Report for Chorus Response to Commission 12 Feb 2014, available at *www.comcom.govt.nz/dmsdocument/11493*

[16] A substantial part of the cost of cabinetisation of the Chorus network was in the trenching needed to lay these feeder cables.

> 173. We also note that for unbundlers, the decision of whether to unbundle is based on the costs of Chorus' existing copper network, not a fibre network.

An unbundler faces a "build or buy" decision in relation to construction of a fibre to the cabinet. Disregarding the fibre to the cabinet costs (by claiming that they are "double recovery") will distort this decision, and distort investment incentives[17].

1.11 Double recovery – clause 4B

The Commission says:

> Clause 4B – double recovery of costs
>
> 187. Clause 4B of Schedule 1 provides that, in applying an applicable FPP, we must ensure that an access provider of a designated service does not recover costs that the access provider is recovering in the price of a designated or specified service provided under a determination prepared under section 27 or 30M or a designated or specified service provided on commercial terms.
>
> …
>
> 189. We intend that whenever we reset the UBA and UCLL price, we will review the routing table that determines how much a given service uses a given network asset.
>
> The review of the routing table will be based on the existing regulated and commercial services at the time of the price reset and will ensure that costs are recovered only once.

This proposed approach is inconsistent with the other proposals of the Commission, because:

- the Commission is proposing to model a hypothetical operator, not Chorus
- the Commission's approach to demand for the hypothetical operator means that the demand for both regulated and unregulated broadband data services are combined in the hypothetical model, meaning that the Commission will already be allocating costs to both regulated and unregulated services – the routing factors alone will not show this effect (as it is coming from demand, not routing)
- the Commission is intending to model a different technology (MEA) to that used by Chorus for UCLL, which adds considerable complexity if services would use the same assets in the modelled MEA but do not in the current network[18] (or vice versa)

[17] It will deter further entry to compete with UBA; it will also deter future investors who observe the Commission not allowing cost recovery on investments which were efficient when they were made as a result of the Commission's decisions in relation to a different service (in this case, UCLL)..

[18] This is an issue with the fibre feeder and the alleged "double recovery" in the previous section of this report.

- the Commission's proposed "aggregated" approach means that it will not be able to identify an asset-service routing table for SLU and possibly other services (e.g. SLES, Sub-loop backhaul) because the service costs will not be being set using a routing table
- Chorus does not provide the same services in all areas and the actual routing factors will vary as a result (e.g. it uses FTTC in some areas and not in others; routing factors for NC-UCLL are very different to SLU). This approach is likely to require different routing tables in different areas even if the actual Chorus technology were to be modelled.
- Chorus is not the LFC provider in certain areas – migration to fibre services will reduce demand for Chorus services in those areas. The Commission's proposed demand assumptions do not take this into account.

1.12 UCLL – performance adjustment for fibre MEA

> 179. Accordingly, TERA concludes that adjustments based on consumer preference or technological performance should not be used in New Zealand. We agree, and consider the following additional reasons support this:
>
> 179.1 First, a performance adjustment is not objectively observable now, and therefore not consistent with our predictability outcome.
>
> 179.2 Second, it is also, arguably, not compatible with the replacement cost view of TSLRIC. We are interested in parties' views on this.

We agree that adjustments based on consumer preference (willingness to pay) or technological performance should not be used.

In our UCLL process and issues paper submission we argued that:

- the performance adjustment approach does not provide correct incentives for investment by Chorus (or a hypothetical new entrant);
- that the willingness to pay "delta" is likely to vary over time and be small;
- that as an approach it is inconsistent with the existence of the LFCs selling services at negotiated prices. If what is being sought is indifference between copper and fibre prices, then the copper price would have to be set in relation to the real LFC prices (rather than the hypothetical price of the MEA),
- and that it is also more costly to undertake.

We agree that any performance adjustment is not objectively observable today (e.g. it certainly cannot be measured where fibre services are not yet available).

We agree that an adjustment would mean that the resulting price would not cover replacement costs.

1.13 Optimisation

> 133. …Our view is that the replacement cost must allow for optimisation. Optimisation is a key component of the ORC methodology for asset valuation.

This choice of ORC is consistent with the Commission's 2004 paper.

We believe that optimisation is indeed a relevant part of the choice of ORC as a valuation methodology. The optimisation is to minimise the NPV of future costs, not just to minimise capital cost or operating cost individually.

The optimisation cannot be to such a degree that the optimised network is incapable of being built, or of providing the required functionality over time. Similarly, it would not be reasonable to assume that the network was shared with an entity that does not have assets in the required locations, or to assume the use of aerial deployment in locations where this is not consistent with local planning regulations. Capital costs need to reflect New Zealand conditions (e.g. seismic bracing, volcanic rock in some locations, hilly terrain, shelter belts of trees). The modelled operating costs must be consistent with the assumed network layout (cabinetisation, aerial deployment) and with the conditions applying in New Zealand (weather, contractor costs, etc). The best way to ensure that the operating costs are achievable will be to compare to the actual costs incurred by existing wireline operators in New Zealand.

The Commission's approach must also recognise that future demand may occur in unexpected locations, which means that there will need to be provision of (as a minimum) local spare capacity.

Finally, in order for an investor to have a reasonable expectation of cost recovery, the depreciation schedule (e.g. via asset lifetimes) will need to take into account the possibility of future optimisation (or changes in MEA) stranding these assets.

1.14 FTTH: PON or P2P

The Commission have said FTTH but not indicated whether P2P or PON.

TERA have offered a clear position advocating that the FTTH elements should be P2P. We agree that if FTTH is selected P2P is essential.

Of the FTTH options we consider that P2P is "unbundleable" on a per-end-user basis allowing an access seeker to install its own electronics to provide layer 2 services and, as long as ATA and battery backup are provided, capable of meeting most of the required criteria.

By comparison GPON is not unbundleable on a per-end-user basis. In a PON, end users share the infrastructure between the splitter and the ODF location. It is possible to provide access to a cluster of end users by renting a splitter at the splitter location (and the fibre connecting that splitter to the ODF location) to each service provider. The way we put this in our UCLL process and issues submission was

> "Even if the other criteria are met, the business case for unbundling depends on the ability to reach many customers from the same point of interconnection at the same per-user cost. However, it cannot be met by unbundling a PON network at the splitter location, as the cost then does not scale per end user in the same way."

Our view is that GPON is not a valid basis on which to cost UCLL.

1.15 Allocation of common costs

1.15.1 Terminology

We believe that the proposal of the Commission could be expressed more clearly if it were to use the same language as other NRAs.

Firstly, the Commission is using the terms:

- "Costs not directly attributable"
- "Costs directly attributable"

For brevity, we prefer the well understood terms "common cost" and "incremental cost" respectively. These are the terms used by other national regulatory authorities. The Commission also uses "incremental" as a substitute term for "costs directly attributable" (in e.g. paragraph 271).

Secondly, the two approaches put forward for network common cost allocation (where cost drivers cannot be identified) by the Commission are different types of LRIC because they differ in their definition of the increment:

- The "capacity based" approach is based on a "large increment" (e.g. all subscribers, all traffic) approach: the costs of the network elements are allocated over all the services using those elements using the service demand levels and the routing table.
- By comparison, the Shapley-Shubik approach is a combinatorial multi-service "small increment" approach.

We think that it would be useful for the Commission to make clear its choice of increment at this stage.

1.16 Allocation of common costs where cost drivers can be directly identified

The Commission is proposing what it calls a "causal" approach to allocation for UBA common costs where cost drivers can be directly identified, based on either what it calls "input based" or "output based" allocation. It gives some examples, but does not propose a principled means to choose between the "input based" and "output based" approaches it discusses. Nor is it obvious that the proposed choices (such as number of cables in the duct) are optimal. For example, as noted below in section 1.17.6, there are specific occasions when we believe that the trench and duct cost should be allocated based on the number of subscribers served.

Further, the Commission is proposing a different approach for UCLL:

> For the UCLL service, our approach is likely to be different given that the UCLL service is not driven by traffic or active customers, but rather by the number of premises to connect.

(We note that the Commission does not identify the proposed different approach.)

If the Commission is to adopt explicitly different cost allocation approaches for different services which do have some assets in common (e.g. feeder trenches, cabinets), it will be very likely to allocate costs incorrectly.

We therefore believe that it will be essential that the cost allocation approach adopted for each asset should be consistent (i.e. the same for all services).

1.17 Common cost allocation for network common costs where cost drivers cannot be identified

1.17.1 No means to identify this category of common costs has been proposed

The Commission has not made it clear how it proposes to identify which common costs have no "identifiable cost driver".

1.17.2 The proposed Shapley-Shubik approach is flawed

The Shapley-Shubik approach has a number of disadvantages but the most critical disadvantage is that it leads to an undesirable dependence of the result on the number of services modelled.

For example, the Commission could choose to model three services being provided:

- NC-UCLL
- SLU
- Other (including UCLFS, SLES and business data services)

Or it could model more services, such as:

- NC-UCLL
- UCLFS
- SLU
- SLES
- Business data services
- Other

Under Shapley-Shubik allocation, the cost allocated to NC-UCLL would be different in these two scenarios[19]. In general terms this dependence of the result for the service of interest on the way in which services not of interest are grouped together is a significant flaw. We therefore consider the Shapley-Shubik allocation method unsuitable.

Other disadvantages of Shapley-Shubik

The use of the Shapley-Shubik allocation method will substantially increase the complexity of the modelling system, and make it less transparent and slower, by requiring the ability for the model to calculate the total cost for all combinations of services, and basing the allocation on the differences between these multiple runs.

Adds complexity. The use of Shapley-Shubik will be flawed unless the model will respond correctly to modelling all combinations of these services (e.g. the model should deploy the efficient (lowest cost) network, with potentially a very different architecture, to carry just one of the services, such as business data services; and it should have the ability to deploy a radically different capacity core network if not carrying UBA). In other words, it will need to be a substantially more complex model to be able to use the Shapley Shubik approach.[20]

Transparency. The transparency suffers because working out "why" a particular cost allocation occurs will be much more difficult with Shapley-Shubik allocation than in the case of other allocation methods. This is because understanding why a particular cost allocation occurs requires comparing the multiple model runs corresponding to all combinations of services.

Slower. The use of Shapley-Shubik allocation will also make running the model more time-consuming.

1.17.3 Capacity-based approach

The Commission has provided little detail of its proposed capacity based approach.

Such an approach depends on the ability to identify the relevant measures of capacity for each network element, such as subscribers or traffic.

We believe that it is possible to use such an approach, even if the different services have a radically different measure of capacity (e.g. subscribers, traffic), as long as the allocation of costs of each asset is consistently applied. However the use of such an approach requires that the costs of services are built up from the costs of the underlying network elements used to provide the service, using a consistent set of demand levels and a consistent routing table. The Commission's proposals do not apply such a method in a consistent way, because costs are not all consistently allocated in accordance with a routing table if the SLU cost is determined in the way proposed by the Commission (as also discussed in section

[19] At its simplest, under Shapley-Shubik a cost which is "common to all services" will be allocated 1/3 to each of the services modelled if there are 3 services, and 1/5 to each if there are 5 services.

[20] We made similar points when noting that combinatorial service increments add material complexity in the section entitled "*Difficulties with a combinatorial service-specific increment approach"* in our submission on the UCLL FPP process and issued paper

1.11). Conversely, the capacity based approach would work if the SLU cost is determined by directly modelling its cost (in the way we propose).

1.17.4 Allocation of common costs to non-telecommunication services

We agree that if modelling a network where there is sharing between telecommunication and non-telecommunication services (e.g. electricity poles) that there need to be common costs allocated between the two sets of services.

An alternative way to do this without greatly increasing the complexity of the model in relation to the number of services modelled (e.g. electricity distribution or services sold to electricity distributor by the telecoms operator) is explicitly to model the stream of cash flows of the payments made between the sharing entities (e.g. per-pole per-annum fees).

In other words, depending on what the model assumes regarding ownership of the poles, this could be implemented in a number of ways:

- The modelled telecom operator owns (and therefore incurs capex and opex for) the common assets (e.g. poles), but receives wholesale revenues (e.g.. per-pole per annum fees) on the proportion of those shared with non-telecommunication service providers
- The modelled telecom operator does not own (and therefore does not incur capex and opex for) the common assets but pays to the non-telecommunication service provider a service charge (e.g. per-pole per annum fees) that can be modelled as an opex for the modelled telecom operator.

1.17.5 Allocation of common costs to non-regulated telecommunication services

We agree that it is appropriate for there to be an allocation of common costs to non-regulated products.

Subject to the proviso noted below, we agree with TERA as quoted by the Commission when it states:

> 269.1 TERA advised us that non-regulated services for the hypothetical efficient provider could be based on the services offered by Chorus in the market at the time we determine a final price.

An important proviso is that TERA's advice can only be applied if modelled demand for regulated services is restricted to demand for the current regulated copper services. However we understand that the Commission has proposed to use demand figures for the modelled regulated services which are not restricted to demand for the regulated copper services but are the sum of regulated copper + fibre (UFB) demand[21]. If the Commission were both to allocate costs to (unregulated) UFB based on existing UFB demand and also to include UFB demand within the modelled demand then the Commission will not be allowing the modelled operator expected cost recovery. In short: if UFB demand is included in the modelled demand for regulated services, then it must not also be allocated costs separately. Conversely,

[21] Including UFB demand in areas in which Chorus is not the UFB provider, which makes the modelled operator scale unreachable by any New Zealand operator. This is a separate point we have previously made.

if UFB demand is not included in demand for the modelled regulated services, then it could be allocated costs separately.

1.17.6 Common cost allocation if modelling both copper and fibre networks coexisting

If the Commission were to change its stated approach to demand for UCLL and not include UFB services in the demand, then it would need to decide how to allocate common costs between the copper and fibre access networks; the most significant of such common costs are likely to be the costs of those parts of the trench and duct which are used by both networks.

In the access network, the costs are mostly recovered from subscriptions, and if modelling both copper and fibre (and a migration from copper to fibre) then the two access services are substituting for each other. In such a case, we believe the cost allocation method for the common costs (here, trench and duct) should be based on the number of subscribers supported rather than based on the number of cables in a trench or the cross-sectional area of those cables. This results in prices which are much more smoothly varying over time and allocates the new technology (here fibre) costs which increase over time in a way that is directly proportional with its ability to cover those costs (and vice versa for copper). In other words, as the demand on the copper network reduces, so the cost of shared assets allocated to the copper network in Chorus' UFB areas will reduce proportionally. Such an allocation method promotes an efficient transition from copper to fibre.

An approach like this has been adopted by ARCEP in France[22].

> "In their responses to the public consultation, all stakeholders expressed a favorable opinion on the method of allocation to the number of sold connections. This method aims to allocate the cost of local loop civil engineering between the copper and optical fibre based on the number of sold retail connections using each technology that use the civil engineering." (Original in French: Analysys Mason translation)

1.18 Tilted annuity/economic depreciation

The Commission's choice of tilted annuity is predicated on the assumption of flat demand; instead it should adopt a depreciation method which allows for the declining demand for UCLL as a result of fixed-mobile substitution and (as a minimum) loss of customers to non-Chorus LFCs.

1.19 Use of PMT

We do not regard the use of a software implementation (an Excel function (PMT)) as a necessary or appropriate means of defining the annuity calculation; but if the Commission wishes to take this

[22] ARCEP Decision No. 2010-1211 dated 9 November 2010, defining the economic terms governing access to France Telecom local loop civil engineering duct infrastructure, page 10 (In French) at http://www.arcep.fr/uploads/tx_gsavis/10-1211.pdf

approach, then it would be advisable to provide all the arguments for this function so as to avoid the potential for later debate.