Cross-submission on UCLL TSLRIC modelling principles

A REPORT PREPARED FOR VODAFONE NEW ZEALAND, TELECOM NEW ZEALAND AND CALLPLUS

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Boxes

Tables

Tables and figures

Executive summary

Frontier Economics (Frontier) has been asked by Vodafone New Zealand, Telecom New Zealand and Callplus (the parties) to prepare a report that considers whether the approach proposed by Analysys Mason to model the total service long-run incremental cost (TSLRIC) of the unbundled local loop service (UCLL) is reasonable.

The approach recommended by Analysys Mason appears to involve a simple revaluation exercise that seeks to estimate the replacement cost of Chorus' existing network assets, rather than a TSLRIC model that attempts to estimate the relationship between demand and cost. It then proposes, amongst other things, that these costs would be recovered using an approach to depreciation that takes account of expected future declines in demand for Chorus' copper network as more and more consumers migrate to other networks (including fibre networks) over time.

We are concerned by a number of aspects of Analysys Mason's approach. Of greatest concern:

- There appears to be an inconsistency between Analysys Mason's proposal that the approach should involve the estimation of the costs of a 'hypothetical new entrant', and its proposal that the approach should model Chorus's current legacy network, and be consistent with the existing dimensioning of this network. A 'hypothetical new entrant' would not be expected to deploy a copper network today, and would also be expected to dimension the network in the most efficient way possible.
- It follows from the above that, by seeking to model the replacement cost of existing network assets in full, the model would retain any inefficiencies presently included in the dimensions of Chorus' network. In our view, it is highly unlikely this would be consistent with a reasonable interpretation of a network that reflected the [efficient] forward-looking costs of providing the service, in accordance with the requirements of the Telecommunications Act (the Act).
- Is the potential to allow Chorus to set access prices that enabled it to recover the full replacement cost of its existing copper network over future declining demand for copper services using an "economic depreciation" schedule.

Analysys Mason's reports are not clear on the implementation of its proposed economic depreciation calculation. On one reading of Analysys Mason's reports, it appears to envisage economic depreciation would be applied on a pure forward-looking basis. That is, the estimate of the full replacement cost of the network would be recovered only over future demand for copper fixed-line services. To the extent that the economic depreciation calculation would be applied in this way, such an approach would allow Chorus to, potentially

significantly, over-recover the costs of providing the UCLL service in the future. In reality, Chorus will most likely have previously already recovered the investment (capital expenditure) on most of the assets it will use to provide the UCLL service in the future, through charges for past demand for the service over a large number of years.

If such an approach were followed, it would lead to a number of undesirable outcomes, such as:

- Pushing the price of the UCLL well above the actual costs incurred in providing the service. To the extent these higher access charges are passed through in the form of higher retail prices for services provided to end-users of telecommunications services, this will generate allocative inefficiencies by reducing consumption of services provided over the Chorus network below efficient levels.
- Disincentivise efficient investment in telecommunications network infrastructure. Chorus will be provided with an incentive to extend the use of existing assets even where it would be more efficient to upgrade its network to reflect lower cost ways of providing the service. The reason is that Chorus will be compensated *as if* it had invested in rebuilding its network, even if it does not do so (and, correspondingly, incurs no cost in doing so). This would lead to a deteriorating quality of its network with an increasing number of faults and poorer quality of service. This would especially be the case in those geographic areas where it did not have a contract to deploy an ultra fast broadband network.

Alternatively, it is possible Analysys Mason believes that the economic depreciation calculation could be applied on a retrospective basis. This would involve estimating when Chorus made investments to build the current network in the past, and applying the economic depreciation calculation over the full lives of the network. Such an approach would lead to a more reasonable recovery of the costs of the modelled network compared to an approach that sought only to recover these costs from future declining demand. However, it would also implicitly make assumptions about how Chorus should have recovered costs in the past that are unlikely to reflect actual cost recovery in the past. For example, economic depreciation approaches, such as those potentially suggested by Analysys Mason, make past cost recovery dependent on current and future variables such as input prices and demand. It is not credible to suggest that access prices decades in the past were set on the basis of perfect or even partial foresight of current input prices, for example historically high copper prices, or future demand trends.

In our view, the approach proposed by Analysys Mason illustrates the risks of focusing too much on creating the efficient build-buy incentives for a potential new entrant, while at the same time meeting the requirement to set prices for access to the existing copper infrastructure. It seeks to estimate the costs incurred

if a new entrant were to build a copper network today, and the charges it would need to set to recover the costs of its investment over a declining future demand for copper network services.

Regulators the world over are increasingly recognising the reality, however, that even if entry were feasible, no new entrant is ever going to enter the market and build a copper network. Focusing on providing appropriate build-buy incentives for copper networks seeks to address a problem that does not exist – there are no new entrants ever likely to be weighing up a build-buy decision with respect to copper.

In these circumstances, we believe the price of the UCLL should be set in a way that provides the amount necessary to ensure Chorus is able to earn a reasonable return on the actual investments it has previously made in its network, taking into account the best estimate of cost recovery to date. This can best be achieved by a forward-looking TSLRIC model that reflects the efficiencies that can be achieved to provide the services; and takes into account that the cost of many of the assets used to deliver the service in future would already been partially (or even fully) recovered through past charges for the service.

For these and other reasons, we continue to recommend the Commission adopt a coherent package of modelling choices such as those set out in our initial report prepared for the parties in response to the Commission's Issues Paper.

1 Introduction

Frontier Economics (Frontier) has been asked by Vodafone New Zealand, Telecom New Zealand and Callplus to prepare a report that considers whether the approach proposed by Analysys Mason to model the total service long-run incremental cost (TSLRIC) of the unbundled local loop service (UCLL) is reasonable.

Our report has been prepared jointly by Frontier Economics Ltd in Europe and Frontier Economics Pty Ltd in Australia. It should be read in conjunction with our initial report responding to the Commerce Commission's (the Commission's) Issues Paper, titled "Determining a TSLRIC price for Chorus' UCLL service" (the Issues Paper).

2 The Analysys Mason approach risks significant unjustified over-recovery of costs by Chorus

Analysys Mason's proposed approach is set out in two reports submitted by Chorus in response to the Commerce Commission's (the Commission's) Issues Paper titled "Process and issues paper for determining a TSLRIC price for Chorus' unbundled copper local loop services in accordance with the Final Pricing Principles" (the Issues Paper). The two reports are:

- a short document titled "Working paper – proposed hybrid approach for modelling the UCLL service" (the Working Paper)
- a more detailed document titled "Response to Commission" (the Response).

The Working Paper sets out, at a high level, a modelling approach that Analysys Mason believes will enable the Commission to more quickly and cheaply build a cost model to estimate prices for the UCLL. Key features of its proposed approach include that it:

- involves developing a "hybrid" cost model whereby the assets modelled to provide the UCLL are the actual assets presently used by Chorus to provide the service
- calculates a "forward-looking" estimate of the value of these assets (i.e. it estimates the forward-looking unit cost of the assets; the assets' economic lifetimes; forecast asset price trends etc.)
- would recover these estimated asset values over time using forward-looking estimates of demand (i.e. the approach to depreciation would seek to recover estimated asset values over the economic lifetime of the assets)

- uses existing network technology as the modern equivalent asset (MEA) in the model, and that the method of network deployment (i.e. aerial, buried or ducted) is consistent with that actually present in the Chorus network.

The timetable set out in the Working Paper document for completing this process makes clear that Analysys Mason envisages that this model would be built for (or on behalf of) Chorus, with other interested parties to provide their views on it through a range of submission and hearing opportunities.

The Response document appears to provide greater detail on how the high-level approach set out in the Working Paper could be achieved by responding to specific questions set out in the Commission's Issues Paper.

We believe that Analysys Mason's proposed approach to modelling the TSLRIC of the UCLL is unsatisfactory, especially when one looks at the totality of the modelling recommendations as a single package.

In our view, the proposed modelling approach maximises the upside costs to be recovered in prices without any clear justification:

- The volume of assets does not allow any significant degree of optimisation, and may include some assets that are fully depreciated (i.e. where the full costs of the assets has already been recovered).
- Full replacement cost of assets such as copper cable is proposed, even though there will be little investment in these assets on a forward-looking basis and no prospect of any copper based entry.
- An approach to dealing with depreciation which either (a) would not be followed by a rational hypothetical new entrant, which is the basis of Analysys Mason's proposal, or (b) is a complex and hypothetical approach which appears to take no account of past cost recovery of the initial investments.

Further, the Analysys Mason approach is inconsistent with the approach proposed by the European Commission in its recent costing recommendation. We are also not aware of such an approach being implemented in practice as proposed by Analysys Mason in another jurisdiction.

3 Modelling actual network assets introduces significant inefficiencies into the model

The approach proposed by Analysys Mason relies largely on using Chorus' actual network assets to provide the UCLL when seeking to model the dimensions of the network for estimating the TSLRIC of the UCLL.

Modelling actual network assets introduces significant inefficiencies into the model

As noted by Analysys Mason in its Response document, Ofcom has previously noted that:

> … the concept of forward looking costs requires that assets are valued using the cost of replacement with the modern equivalent asset (MEA). The MEA is the lowest cost asset which serves the same function as the asset being valued. It will generally incorporate the latest available and proven technology and is the asset which a new entrant might be expected to employ.[1]

Relying heavily on the actual design of the Chorus network, as Analysys Mason recommends, is therefore unlikely to be consistent with the requirement for the service to be delivered based on "forward-looking" costs. While some form of modified scorched node network seems reasonable when developing a TSLRIC model for the UCLL, it is not clear that this should extend to using *all* existing assets in the Chorus network.[2]

A key objective of a sensible costing approach is to ensure prices maximise the consumption of the service whilst maintaining appropriate incentives for Chorus to undertake (efficient) investment. Given this, a more appropriate approach for the Commission to take when seeking to determine which existing network assets should be retained in a model of the forward-looking cost of the UCLL is to ask which network assets would be consistent with the *efficient* delivery of the service today.[3]

In the current market environment, the efficient delivery of the service would involve the use of some of the existing Chorus infrastructure, but may well involve a more efficient network dimensioning than Chorus's current deployment.

We also note that Analysys Mason seems to propose that the approach to cost modelling should aim to emulate the costs that would be incurred by a hypothetical new entrant. We note that this is inconsistent with the apparent proposal put forward by Analysys Mason that the cost modelling should (largely) be based on the dimensioning-costs of the existing Chorus network. Such a hypothetical new entrant would be expected to (a) use some of Chorus's existing infrastructure, such as ducts and trenches and (b) not use copper cables. Such an entrant would also be expected, in general, to seek to deploy its network today in

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1 Ofcom (1997) as quoted in Analysys Mason, *Response to Commission*, 12 February 2014 at p. 2.

2 We note that Analysys Mason does note at p.2 of the Working Paper that "Some relatively small adjustment to cable capacity could therefore be argued to be justified", and indicates it could accommodate this in a model for the Commission. Overall, however, the approach to modeling the TSLRIC of the UCLL recommended by Analysys Mason appears to involve almost no "scorching" of the network at all.

3 This is consistent with the approach to forward-looking bottom-up cost modelling recommended in our report in response to the Commission's Issues Paper.

a way that would be more efficient than the deployment of Chorus' network, which has taken place over a very significant period of time.

4 It is unclear how Analysys-Mason proposes to take account of past recovery of costs (i.e. accumulated depreciation)

It is commonly understood that a regulatory depreciation methodology requires two elements:

- A current valuation reflecting the net value of the assets which is the gross value of the assets less accumulated depreciation of assets to date
- depreciation of the estimated value of assets going forward.

To illustrate the distinction, suppose that the gross replacement cost of Chorus' copper loops was estimated at $100 million. Suppose also that it was assumed there were 5 million lines in the network, and that Chorus would only be able to sell UCLL services for another 10 years. Finally, assume (for simplicity) that demand for these lines was constant over the remaining 10 years of the economic life of the asset.

If this were the case, and we abstracted from the need to ensure a return on the value of this capital, a simple approach to economic depreciation might involve Chorus being able to recover $10 million over each of the next ten years to enable it to recover the full $100 million estimate of the forward-looking cost of the copper loops.[4] With 5 million lines in the network, this would imply Chorus was able to recover $2 per line each year to recover the cost of the loops.

Such an outcome would fail, however, to take account of the fact that Chorus would have already been earning revenues in the past that contributed toward the cost of the existing assets in its network. In this respect, it may be the case that most (or possibly all) of the actual costs incurred by Chorus when building the existing network have already been recovered through past charges for services provided over the network. As a result the net value of the assets would be less than gross replacement cost.

In our view, it would be inappropriate to value the existing network at the full costs as if it was rebuilt today, and then recover the full modelled costs only over

[4] In effect, this is a straight-line depreciation approach. Given the simplifying assumption of a 0% rate of return on capital, however, this gives the same outcomes as a simple annuity approach to depreciation. Other depreciation profiles could be chosen (e.g. tilted annuities that seek to take account of changes in asset prices over time). For simplicity and ease of exposition, however, we have chosen to illustrate the point using a straight-line/simple annuity approach to depreciation.

It is unclear how Analysys-Mason proposes to take account of past recovery of costs (i.e. accumulated depreciation)

future actual demand for the service. Such an approach to modelling the network would enable Chorus to over-recover whatever costs it actually incurred when building the network. Instead, we believe it would be more appropriate to:

- first, adjust the estimated net value of the assets to reflect past cost recovery. When applied to an optimised replacement cost network, this is referred to as depreciated optimised replacement cost (DORC or ODRC) in some jurisdictions.[5]
- second, then recover the remaining "undepreciated/unrecovered" net value of the asset over the remaining economic life of the asset.

Returning to the example above, suppose it could be estimated that Chorus had, previously, recovered $80 million of the cost of existing copper loops via previous charges for services provided over the network. In this case, a DORC/ODRC approach to modelling network costs would set the opening value of copper loop assets in the model at $20 million. This amount could then be recovered over the forecast demand levels for the remaining 10 years of the asset's economic life. In this simplified example, the amount that Chorus would be entitled to recover per line over the remainder of the asset's economic life would be $0.40 per line per annum.[6]

5 To the extent that previous charges (and hence cost recovery) reflected accounting depreciation, the ratio of net book value of assets (gross book value less accumulated depreciation) to gross book value may be a reasonable estimate of the proportion of the asset value that has been recovered to date.

6 An alternative way to ensure prices don't grossly over-recover the costs of the network is to adopt the anchor pricing approach utilised by Ofcom (and referred to in our report for the parties on the Commission's Issues Paper). Under this approach, one could model the cost of building the network as new – perhaps using a full replacement cost model (incorporating use of some civil legacy assets that would be efficient to re-use). However, in order to deliver sensible modelling outcomes, the model would assume that demand for this network would be stable into the future so that demand does not decline. In essence, this approach tries to minimise transition issues from copper to fibre by saying that customers shouldn't pay more because of other customers migrating to new technology (i.e. prices shouldn't rise due to falling demand from other users)

It is unclear how Analysys-Mason proposes to take account of past recovery of costs (i.e. accumulated depreciation)

4.1 Analysys Mason's position on economic depreciation and valuation are critical, but unclear

The proposed Analysys Mason approach provides scant detail on how it would deal with issues of asset valuation and depreciation of its modelled copper network. Two readings appear possible:

1. There is a forward-looking valuation of the network (replacement costs), declining demand is imposed, but there is no account taken of the past use or depreciation of the network.[7]
2. Analysys Mason intends to use an 'economic depreciation' approach to model the re-built asset over its entire current life.

The first approach seems to create the problem that a network is modelled to be built as new, and then recovered in the remaining economic life of the assets – possibly as little as 5-10 years. To the extent that Analysys Mason does not envisage the model would make any DORC/ODRC adjustment to the value of the existing assets in the network, we believe this would generate a number of perverse outcomes for New Zealand end-users. In particular, it would:

- enable Chorus to over-recover the actual costs it has incurred in building its network. That is, it would enable it to fully recover the re-valued costs of the network in addition to the amounts it has previously recovered in the past
- push the price of the UCLL well above the actual costs incurred in providing the service. To the extent these higher access charges are passed through in the form of higher retail prices for services provided to end-users of telecommunications services, this will generate allocative inefficiencies by reducing consumption of services provided over the Chorus network below efficient levels
- Disincentivise efficient investment in telecommunications network infrastructure. Chorus will be provided with an incentive to extend the use of existing assets even where it would be more efficient to upgrade its network to reflect lower cost ways of providing the service. The reason is that Chorus will be compensated as *if* it had invested in rebuilding its network, even if it does not do so (and, correspondingly, incurs no cost in doing so). This would lead to a deteriorating quality of the network with an increasing number of faults and poorer quality of service, and be contrary to the achievement of dynamic efficiency over time. This would especially be the case in those

[7] For example, about depreciation, Analysys Mason says "Accounting-based (top-down) approaches are inappropriate for a hypothetical new entrant (there is no past asset base to consider)."

It is unclear how Analysys-Mason proposes to take account of past recovery of costs (i.e. accumulated depreciation)

geographic areas where it did not have a contract to deploy an ultra fast broadband network.

We believe all of these outcomes are contrary to the purpose set out in section 18 of the Act.

If the alternative reading is correct (i.e. that Analysys Mason intends to use an 'economic depreciation' approach to value and depreciate the re-built asset over its present life), this would imply the estimated replacement cost of existing assets would need to be recovered over an economic life involving both past and present periods. We believe this approach has more merit in principle than the first approach outlined above, because it would at least seek to take some account of past cost recovery of assets when determining how much capital costs should be recovered in the future.

Analysys Mason does not, however, explore further some of the significant conceptual and practical issues that such an approach must deal with. The key issue is that using a retrospective *modelled* depreciation profile that is inconsistent with the *actual* historic cost recovery profile (which may have reflected accounting depreciation) could be expected to lead to departures from cost recovery.[8] In particular, if the valuation of the network implied by the model was higher than the investment to date less cost recovery to date, investors would recover more than their initial investments, i.e. there would be a transfer from customers to investors.

The Chorus local access network has assets that have been in service for up to half a century. Introducing a novel depreciation approach at this point in time could lead to significant unearned holding gains (and hence cost over-recovery) for Chorus's shareholders. Ofcom in the UK recognised this when setting LLU prices, applying a 'RAV adjustment' reflecting changes in depreciation methodology over time to ensure that BT did not benefit from the adoption of current cost accounting.

We also note other issues with Analysys Mason's 'proposal' on economic depreciation, discussed in Annex A to its response to the Commission, in Box 1.

8 To the extent that depreciation methods which ensure NPV (allowable revenues) = NPV (investment) are consistently applied, investors should be indifferent to the methodology used. However, at each point in time the remaining value of the assets to be recovered will differ between methodologies, i.e. the net value of the assets. Changing between methodologies during the lifetime of the asset will result in changes to the value of existing assets and hence holding gains or losses. This will lead to a departure from cost recovery.

It is unclear how Analysys-Mason proposes to take account of past recovery of costs (i.e. accumulated depreciation)

Box 1: Issues with Analysys' proposals for use of 'economic depreciation' for the UCLL

In Annex A, Analysys Mason suggests applying a depreciation approach which takes into account the utilisation of assets over their lifetime although the exact details of the implementation proposed is not clear. Whilst there are some theoretical advantages of such an approach, in terms of making prices more stable over time there are a number of practical difficulties:

- The approach typically requires estimating demand volume and asset volumes over the whole life of the assets currently in service in order to estimate utilisation over time. As duct has an asset life of 50 years, this requires collecting historical data for the last 50 years and making forecasts for at least the next 50 years. It is not clear how Analysys propose to estimate demand volumes and network dimensioning for a complete century.
- Making allowable revenues dependent on forecasts of the future network dimension and demand introduces subjectivity into prices. For example Analysys Mason's assertion that fixed network volumes can be expected to drop in the future due to competition from other platforms is clearly subjective.
- The depreciation approach implicitly assumes perfect foresight, i.e. that managers were able to set cost recovery, and hence prices, in the past based on the level of demand and input prices far into the future.
- Unless the depreciation approach takes into account cost recovery to date, which was unlikely to reflect Analysys Mason's algorithm, there is a risk of a significant holding gain or loss, leading to either customers overpaying or investors not being fully compensated for past investments.

While the type of economic depreciation suggested by Analysys has been used widely for setting mobile termination rates, there are significant differences with the application to UCLL prices:

- The assumed lifetime of mobile assets is considerably short than the lifetime of the fixed access network.
- Mobile networks were subject to rapid demand growth in the immediate past and this demand growth was to a degree predictable, meaning that it was reasonable to adjust cost recovery to take account of the known relatively low utilisation of assets in the past as demand was being built up and there was evidence to support this.
- Economic depreciation was applied in the context of bottom up models of networks, allowing past and future network dimensions to be linked to demand.

Source: Frontier

It is unclear how Analysys-Mason proposes to take account of past recovery of costs (i.e. accumulated depreciation)

5 The Analysys Mason approach to modelling selectively chooses elements of reality

The Act requires the Commission to use a forward-looking TSLRIC methodology. In our view, it is helpful for the modelling approach to be somewhat grounded in market reality when it comes to developing an approach to network optimisation. This enables more focus to be placed on actual likely future behaviour instead of debating hypothetical constructions of what a new entrant might do.

The reality of the copper access network at the present time is that:

- Copper cables are old and essentially only being maintained, with little new capital expenditure. This makes sense because, over time, these networks are being replaced with fibre networks.
- The ducts and trenches in which the copper cables are laid can be reused in fibre networks, so investments in these assets will continue to be made to ensure their continued use.

The Analysys Mason approach does attempt to deal with some real world problems: it focuses on the nature of the full copper network as a declining technology, and seeks to model Chorus' network in view of this being a reasonable (rather than hypothetical) benchmark. However, its present proposal omits mention or makes no obvious attempt to deal with other realities. For example, there is no mention of dealing separately with the valuation and use of trenches and ducts, which have continuing value and will experience no decline in demand. Nor does it attempt to deal with the issue that a hypothetical new entrant, which it advocates, would not realistically incur the full replacement costs of a copper network.

An example of the problems of this selectivity is evident with no recognition of the problems of:

- **Using an inventory of current assets**: local access networks have been rolled out over many years. Asset information may well be very poor or variable, and while sampling may be used to test the veracity of data, this will expose the process of collecting data to further errors. For example, in the UK, there has been considerable variability of the volume of assets estimated over time, depending on the data source used and the sample. This variability indicates the limited accuracy of such approaches (even without taking into account any systematic bias in the data).
- **Valuing assets as new that would never be replaced**: When considering the forward-looking costs of networks, we need to take account of the assets

that would be replaced if the network continued to be operated in the future. Typically in the access network there are assets of over 50 years, such as ducts, which are still used, even where the assumed asset life is shorter than this. Similarly copper cables, with a typical design life of 20 years, are not currently being replaced meaning that a number of cables may be fully depreciated. The investment in fully depreciated assets will already have been recovered through downstream prices. Including such assets in the asset base used to set prices will result in an over-recovery of costs. For this reason, BT makes an allowance to exclude fully depreciated assets, when using inventory data to estimate the current replacement cost of its network.

- **Using the full replacement costs of copper cables in the network**: using the full replacement costs of copper presents problems as a hypothetical new entrant, as advocated by Analysys Mason, would not build a copper network today:
  - The investments in copper cable were made at a time when the copper price was much lower. Valuing copper cable at current replacement cost would result in a holding gain for Chorus, effectively transferring wealth from end users to Chorus shareholders.
  - The copper network is likely to be run down overtime, with the network being maintained rather than replaced.[9] As such the current costs of copper cable will not be a significant input to Chorus's future investment decisions.
  - Making future charges dependent on volatile copper prices will increase uncertainty for all stakeholders, risking investment and leading to an increased cost of capital.

6 The Analysys Mason model will not achieve many standard regulatory modelling objectives

In our report for the parties in response to the Commission's Issues Paper, we identified a number of objectives different regulators seek to achieve – to varying

[9] In this regard, we note recent statement by Chorus that "All non-UFB/RBI capex under review" and that "growth spend expected to reduce as align to utility-like market practice of cost recovery of new build; shift to fixing network faults on a reactive basis rather than investing in proactive maintenance". See: Chorus, Half Year Result, FY 14 at http://www.chorus.co.nz/file/42849/Investor-Presentation.pdf at p. 33.

The Analysys Mason model will not achieve many standard regulatory modelling objectives

degrees and in varying combinations – when modelling the cost of providing an unbundled copper local loop service. These were:

- ensuring efficient use of existing infrastructure
- providing a reasonable expectation of certainty of cost recovery for investors to preserve efficient incentives for parties to invest
- providing incentives for access providers to minimise their costs when providing the service
- providing correct build or buy incentives for potential access seekers who might otherwise build their own infrastructure to provide the service, where relevant
- mitigating any inefficiencies from past investments
- seeking to replicate outcomes of effectively competitive markets.

We also noted that, in many cases, some of these objectives might be in conflict with each other when it comes to deciding what approach to taking to modelling the cost of an unbundled local loop. For instance, if a regulator decides it is important to provide the right build or buy incentives for a potential new entrant, then the regulator may choose to develop a model that is highly optimised, and may even seek to model a greenfield network. However, because the model is not based on the actual costs incurred by the access provider when building the network, it could compromise the extent to which the existing infrastructure is used efficiently. When developing a cost model, therefore, regulators will need to consider the appropriate prioritisation of, and balance between, the objectives set out above.

In our view, however, there is a risk that the modelling package proposed by Analysys Mason would fail to achieve many of the key objectives set out above. The reasons for this are explained in Table 1 below.

Table 1 Achievement of regulatory objectives

Regulatory objective	The Analysys Mason set of recommendations
Ensuring efficient use of existing infrastructure	The cost recovery approach proposed by Analysys Mason does not appear consistent with this objective as it could lead to Chorus being unjustifiably over-compensated for its past investments. Models that take account of past cost recovery (i.e. depreciation) when determining the value of assets that needs to be recovered over future periods are better placed to achieve this objective.
Providing a reasonable expectation of cost recovery for investors	Models based on the recovery of actual/historic costs are better suited to achieving these objectives. For instance, a model that sets an opening asset valuation via some form of depreciated historic/actual cost methodology, and then rolls forward actual capital costs incurred is likely to provide more confidence to

The Analysys Mason model will not achieve many standard regulatory modelling objectives

	investors that they will be able to recover actual costs incurred. Models that involve re-optimisation at regular intervals are less likely to achieve this objective because it is less clear what asset value will arise at each re-optimisation. By allowing Chorus to recover the full replacement cost of the network over only future anticipated demand, the model would allow Chorus to greatly over-recover the actual costs it has previously incurred when building its network. This means regulated revenues will depart greatly from costs actually incurred by investors.
Providing correct build or buy incentives for potential access seekers	This objective is best achieved by a modelling approach that reflects the circumstances of a 'hypothetical new entrant'. While the Analysys Mason approach uses replacement costs that would be faced by a new entrant, the use of copper as the MEA and the low level of optimisation in the proposed model means it is unlikely the model will help with the achievement of this objective.
Mitigating inefficiencies from past investments	The Analysys Mason approach would not achieve this objective as well as other models. It largely keeps the existing network design (rather than seek to optimise the network to any large extent), and may result in full recovery of replacement costs – including for those assets that would not be replaced in a forward looking design.
Replicate the outcomes of effectively competitive markets	The network that Analysys Mason proposes to model is not a network that any party could seek to profitably build to provide the service. A competitive market would not be consistent with a new entrant building 'today' a full replacement copper network to deliver the service, and then recovering these costs only over a declining future demand base. The resulting price/quality of service offers would not be expected to be able to compete with the prices/quality of service of offers available over fibre networks.

7 Analysys Mason fails to get the package of recommendations right

As indicated above, the approach recommended by Analysys Mason would lead to the modelling of a network no new entrant would ever build. Forward-looking TSLRIC models were originally advocated by regulators during the late 1990s and early 2000s at a time when telecommunications markets were being newly liberalised. At that time, it was considered possible that new entrants to the market may decide to build their own networks. Accordingly, regulators were keen to ensure they took an approach to cost modelling that provided efficient build-buy incentives for potential access seekers. The idea of a forward-looking cost model was to estimate what would be the costs an efficient new entrant might face if it were to build a network of its own to provide fixed-line services

to end-users rather than seek (i.e. buy) access from incumbent network operators. If the potential access seeker thought it could build a network itself to provide services more efficiently than that envisaged in a forward-looking TSLRIC model, it would have the incentive to build rather than buy access.

As observed in our initial report, a number of regulators have recognised that the prospects of national infrastructure based entry are limited, and that legacy copper networks have the characteristics of natural monopolies, with limited prospects of duplication. In such circumstances, regulators are adopting cost models for unbundled local loops that, whilst being forward looking in the sense of incorporating efficiencies into the dimensioning and operation of network assets, aim primarily to ensure services are offered at a cost that ensures access providers are able to make a reasonable return on their investments. This implies in general seeking to minimise the risk of unjustified cost over-recovery for access providers.

The approach proposed by Analysys Mason seems to entirely ignore this development. It instead appears to be seeking to model the costs of replacing the copper network in full today, and then potentially recovering the costs of this network only over future remaining demand for copper network services. If this interpretation of the Analysys Mason approach is correct, this would lead to Chorus being compensated as if it had built a brand new network today in order to incentivise entry that is not expected to take place. But even if such entry was to potentially be feasible in some areas, it is unrealistic to postulate that a new entrant could enter profitably the market in such areas to serve the demand using a copper network, the demand for which is expected to decline over the next 5-10 years: this would require prices that no new entrant could ever profitably charge in a market. The overall effect of such an approach would be to raise final prices for end-users of fixed-line telecommunications services without leading to any increase in the likelihood of infrastructure based entry.

This is not to say that none of the recommendations contained in the Analysys Mason report could be fitted into a sensible TSLRIC model. For instance, as can be seen from our previous report on the Commission's Issues Paper, we have sympathy with retaining some existing network assets in a TSLRIC model for the UCLL. That is, we do not advocate a full scorched earth model. We also believe there are some benefits in cross-checking a bottom-up model with actual data from Chorus' financial information (where this information is readily available and reliable).

We continue to believe a more appropriate package of recommendations for the Commission to follow would be either of the options set out in our initial report in response to the Issues Paper.

Analysys Mason fails to get the package of recommendations right

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