Study on potential cost over-recovery in the BBM model for fibre services

Report

Spark

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Content

1 Introduction

1.1 Background and objectives of the report

The Commerce Commission (the Commission) regulates telecommunications services, in particular by setting cost-oriented tariffs for some regulated services.

In theory, the principle of cost orientation ensures that the service provider (here Chorus) recovers exactly the costs it incurs to provide the regulated services (including a reasonable margin on its investments, commonly captured by the WACC).

Such costs consist of investment costs (CAPEX), which are recovered over each asset life, and operating cost (OPEX) for network maintenance and operation.

In order to assess those different cost categories and derive a unit cost (and therefore a tariff) for each regulated service, regulatory authorities develop cost models which are designed to reflect the cost structure of the service provider (generally adjusted to capture potential efficiency gains).

The New Zealand market is experiencing the development of fibre technology as an upgrade of the existing copper network. Both of these two technologies are currently available in New Zealand and wholesale services based on each of them are subject to regulation by the Commission.

In December 2015, the Commission finalized its model to set tariffs for regulated copper services. The principles on which this cost model relied were detailed in the decision NZCC37 [2015].

In November 2018, the Commission proposed to set cost-oriented tariffs for regulated fiber-based services using a new model, called a Building Block Model (BBM).

While both models seek to estimate the total annualized cost of the network and allocate total costs to the services which use it, the two models are fundamentally different in their approaches. First, in establishing the total annualized cost base, and second in allocating the cost base to the different services provided through the network.

In principle, there would not be any issue in using two different approaches to model distinct networks (a fibre network and a copper network) providing distinct services. However, in practice, those two networks share a significant portion of common costs. In particular:

- The fibre network and the copper networks are deployed over the same civil engineering infrastructure (trenches, ducts and poles), and
- Some operating costs are common to both networks (network IT systems, maintenance staff, etc.).

This raises some structural issues as to the extent to which network costs are efficiently recovered by Chorus. Indeed, the copper model has been used to set prices since 2015, and ensures that a specific share of fibre and copper common costs is recovered through regulated copper access services. Prior to 2015, copper prices were set using a price benchmarking methodology of comparable countries using a TSLRIC model.

Using a new costing approach for fibre based services could lead first to different estimates of the total amount of such common costs and, second, to different allocations between copper and fibre, leading to a significant risk of cost over (or under) recovery by Chorus.

This risk was previously raised by stakeholders including Spark:

> *"**Spark submitted that double recovery should not occur** and that it was inconsistent with the Part 4 and Part 6 purpose statements. Frontier also submitted against allowing double recovery." (Technical paper § 301, emphasis added)*

However, less attention seems to be paid by the Commission to what is an essential issue relating to cost oriented regulation:

> *"**We consider that it would be impractical to fully ensure that** in regard to UFB past losses and the FPP for UBA **there is no double or under-recovery, or to fully demonstrate it.**" (Technical paper § 385, emphasis added)*

Spark has indicated that all parties accept that there should be no double recovery of costs across regulated copper and fibre services. However, Chorus points out in its submission to the Commission[1] several concerns that mean a check against double recovery between copper and fibre services is not possible.

In this context, Spark asked TERA Consultants to consider the potential risk of cost over-recovery by Chorus, and to propose some methodological options to mitigate such risk.

Note: The BBM model is still at a very high level of specifications, and the consultation document is rather not prescriptive. Therefore, all the risks identified further in the report are at this stage purely theoretical and their existence will depend on the methodological options that will be retained.

1.2 Structure of the report

To achieve this objective, this report is structured in two main parts, dealing:

- First, (in section §2) with an overall analysis of the consultation document and identification of areas where potential double recovery might lie; and
- Second, section §3 suggests some practical recommendations that could overcome or at least mitigate the issue of double recovery of costs.

[1] Chorus submission, §115 to 122 - https://comcom.govt.nz/__data/assets/pdf_file/0025/161917/Chorus-Fibre-emerging-views-submission-16-July-2019.pdf

2 Over-recovery risk assessment due to the coexistence of two cost models

From a theoretical point of view, it is possible to regulate two technologies (copper and fibre) operating mainly on the same shared infrastructure (civil engineering assets) using two distinct models but, in practice, that raises several questions about how the Commission can best ensure regulation is properly applied.

While regulated copper services are priced on prices set by the Commission as part of the final pricing principle (FPP) using the TSLRIC model, regulated fibre services are intended to be regulated in 2022 based on the so-called BBM method.

The cost models rely, in practice, on different principles/concepts designed to send the appropriate signals to the market. Thus, the use of two costing approaches structurally different from each other carries intrinsic risks of over-recovery of costs.

The objective of this section is to summarise the most important aspects of each modelling approach and discuss them in the light of the issue of cost double recovery.

Section §2.1 presents the general principles of the BBM approach that will be applied to fibre services, and analyses the main methodological choices behind it.

Section §2.2 discusses the TSLRIC approach in light of the cost recovery issues addressed in this paper and lists the main characteristics behind such bottom-up approach.

Section §2.3 shows that using the two approaches separately and simultaneously to regulate two closely related technologies (operating on the same civil engineering infrastructure), is a potential source of double recovery of costs.

2.1 BBM model principles

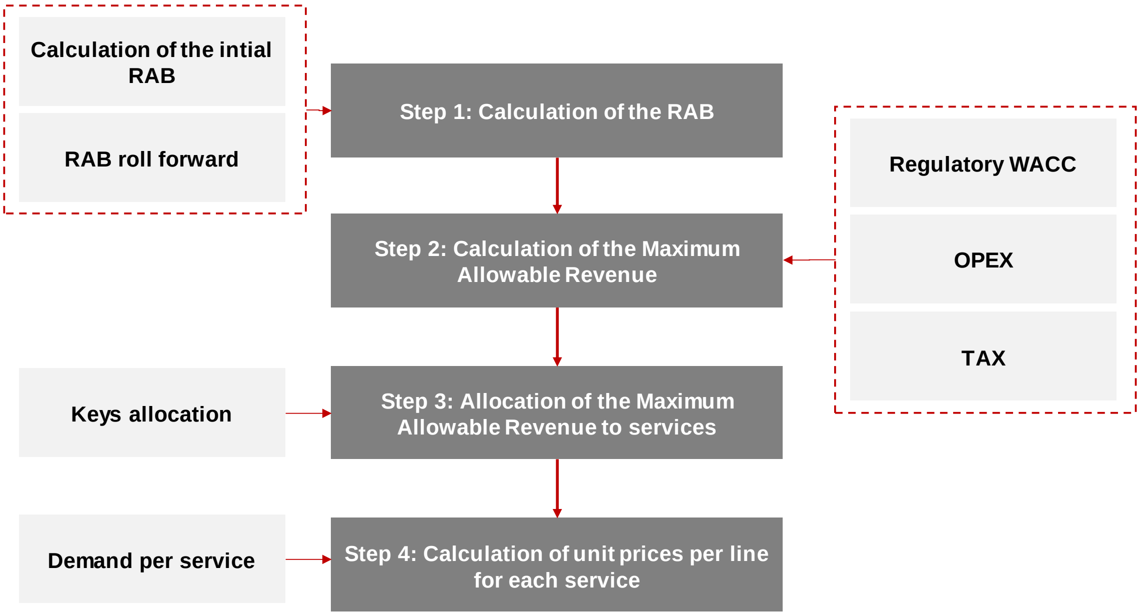
2.1.1 BBM model high level description

The BBM approach is newly introduced in telecommunication regulation in New Zealand. The approach has been adopted in the telecommunication sector in Australia, as well as for electricity and gas utility regulation in New Zealand. Commonly used in the regulation of monopolies in the utility sectors, the BBM approach sets the maximum allowable revenue based on the costs effectively incurred by the regulated suppliers while allowing a reasonable profit.

Under BBM, a regulated supplier's allowed revenue is equal to the sum of underlying components or 'building blocks,' consisting of the return on capital, return of capital (or depreciation), operating expenditure, and various other components such as taxes and revaluations. The initial asset valuation is carried out and is then updated over time based on actual efficient capital expenditure and depreciation.

More specifically, the BBM approach is implemented in practice using four main steps described in the following scheme:

Figure 1 – BBM implementation steps



Source: TERA Consultants

Those four steps are further described below.

Step 1: calculation of the RAB

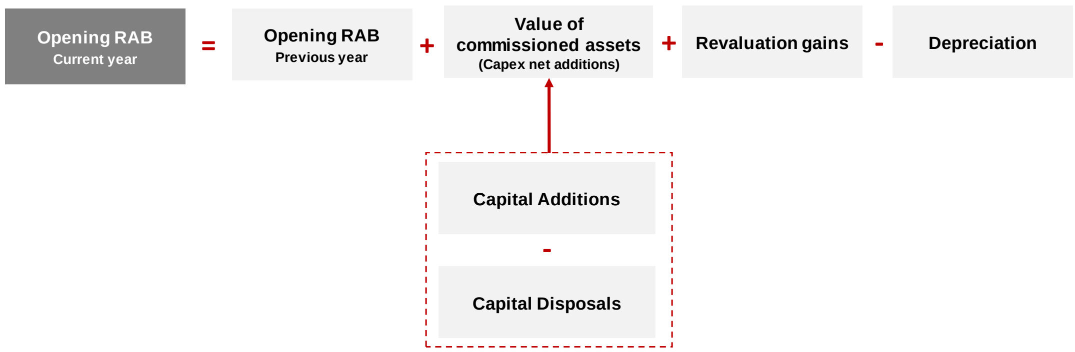
The Regulatory Asset Base (RAB) valuation is a key element to be dealt with under BBM approach. The RAB is (in the broadest sense) the value of the asset base invested in order to deliver services (here fibre services). Under BBM approach, it is determined yearly using a "Roll-Forward" mechanism starting from an identified initial RAB.

Thus, two key elements are essential to calculate the RAB:

- Calculation of the initial RAB: this is the initial value of the fibre assets that should be composed of all costs incurred as a direct result of meeting specific requirements of the UFB initiative including the initial financial losses, which are "*incurred by the provider in providing fibre fixed line access services under the UFB initiative for the period starting on 1 December 2011 and ending on the close of the day immediately before the implementation date*".
- "Roll-Forward" mechanism: Once the initial RAB is identified, the value of the RAB is rolled-forward for the next regulatory periods. It is determined considering asset's annual depreciation, the forecasted net capital invested (capital additions – capital disposals) and Revaluation (to take into consideration inflation effects).

The Roll-Forward mechanism could be summarized as follow:

Figure 2 – Roll-Forward mechanism



Source: TERA Consultants, based on ComCom technical paper §3.17

The initial RAB calculation is a key element in assessing fibre costs in the sense that it is the main element that conditions the cost base. It should therefore be addressed particularly carefully during the implementation.

Beyond the question of the valuation, the scope of costs to be considered within the RAB is very important. This issue is closely related to the question of cost allocation (and thus to the core issue discussed in this paper).

The RAB scope to be considered in the fibre BBM model should be consistent with services costed by the BBM, meaning that only assets associated with fibre services (costed by the model) should be part of the RAB. These assets are of two forms, (i) specific assets and (ii) shared assets:

- Specific assets are the set of assets that are specific to providing the fibre service (e.g. Fibre cables);
- Shared assets are all assets that are shared between fibre services and other technologies (e.g. Civil engineering assets).

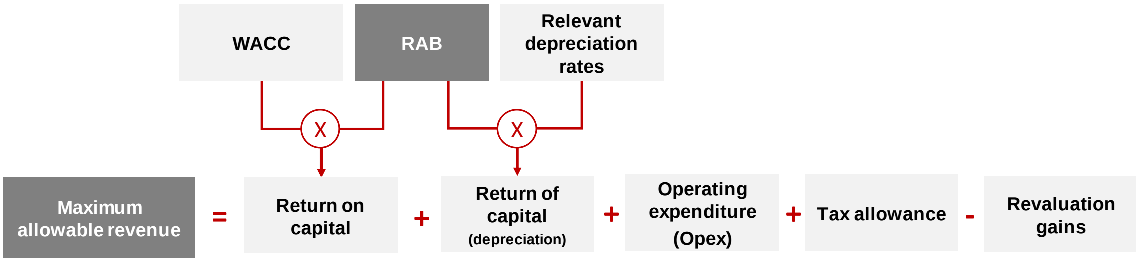
While fibre specific assets should be totally included in the BBM RAB, only a portion of shared assets cots should be considered in the RAB, and therefore recovered by fiber services. Therefore, the main concern related to the RAB determination is how to allocate shared assets to fibre network in order to calculate the relevant RAB to be used without including any part of cost that is already recovered by copper services (TSLRIC model).

This point will be further discussed in section §2.3.

<u>Step 2: calculation of the maximum allowable revenue</u>

The BBM approach allows calculating the Maximum Allowable Revenue (MAR), classically based on the formula described below:

Figure 3 – Calculation of the Maximum Allowable Revenue (MAR)



Source: TERA Consultants, based on ComCom technical paper §3.17

The Building Blocks Allowable Revenue is computed as the sum of several “blocks” representing the costs effectively incurred by the service provider such as: the depreciation of the several assets composing the RAB, their Operating Expenditure (Opex) associated with maintenance and other operating costs incurred to provide fibre services, Tax allowance as well as a reasonable profit calculated considering the regulated WACC.

Calculation of the Maximum allowable revenue should exclude any other incomes in addition to Revaluation Gains.

It should be noticed that, similarly to the RAB allocation, operational expenditures should be properly allocated between copper and fibre so as not to allocate already recovered copper shared Opex to fibre services.

This point will be further discussed in section §2.3.

<u>Step 3: Allocation of the maximum allowable revenue to services</u>

Once the MAR is calculated for all fibre services, an allocation process is to be applied to allocate the MAR to fibre services.

Relevant key allocations need to be chosen appropriately.

The Commission has already explained its emerging views on the cost allocation in its consultation document:

> *“**We consider that the accounting-based allocation approach (ABAA) is most appropriate for shared costs including the use of causal allocators** and propose to adopt the definition of a causal relationship that is used in the part 4 regime.” (Technical paper § 253.1.2, emphasis added)*

Although this is not yet clearly specified in the technical paper, adopting a causal allocation rule (in its broadest sense) seems to be appropriate to allocate fibre costs to fibre services.

At this stage, since the fibre RAB is isolated from copper in step 1 (meaning that a preliminary allocation between copper and fibre has already been performed), the allocation process presented in Step 3 concerns only fibre services which does not seem to generate any risk regarding over-recovery of costs between copper and fibre.

<u>Step 4: Calculation of unit prices per line for each service</u>

Calculation of unit prices per line for each service could be then derived based on the appropriate demand considered consistently with the scope of services considered.

2.1.2 Preliminary assessment of the approach

All submitters accept that, as described above, the BBM approach can be applied to fibre networks. The Commission has consulted the industry concerning its application (BBM approach) in the telco sector and all submitters indicated preliminary agreement to the principle, while raising several questions regarding the adjustments needed to the approach:

> *"We agree that, in practice, Part 6 regulation is likely to be a building block model approach in its broadest sense – e.g. setting prices or revenues with the objective of efficient prices and to provide incentive regulation – and it can be informed by general approaches under Part 4. **However, BBM implementations vary depending on the statutory and market context. In the case of Part 6**:*
>
> *The **Commission is also required to make decisions that promote competition** in telecommunications markets; and*
>
> *The **approach to incentives and risk allocation must reflect the practical context** within which regulation is being applied and specific Part 6 requirements, e.g. to apply a revenue cap and wash-up mechanism." (Technical paper, emphasis added)*

Beyond the advantage of simplicity of the BBM approach compared to the existing TSLRIC approach (in New Zealand), it should be noticed that this approach comes with substantial changes compared to the existing approach.

The BBM approach is a top-down approach that relies mainly on accounting data provided by the regulated firms' accounting systems.

Moreover, beyond questioning the BBM itself, it is its partial application in the New Zealand telecommunication context, which is already partially regulated by a TSLRIC approach (for copper services) that could be problematic as raised in the quote above.

The next section briefly discusses the current TSLRIC approach in the light of the points discussed about the BBM method and on the aspects that could generate a risk of over-recovery.

2.2 Current TSLRIC model principles

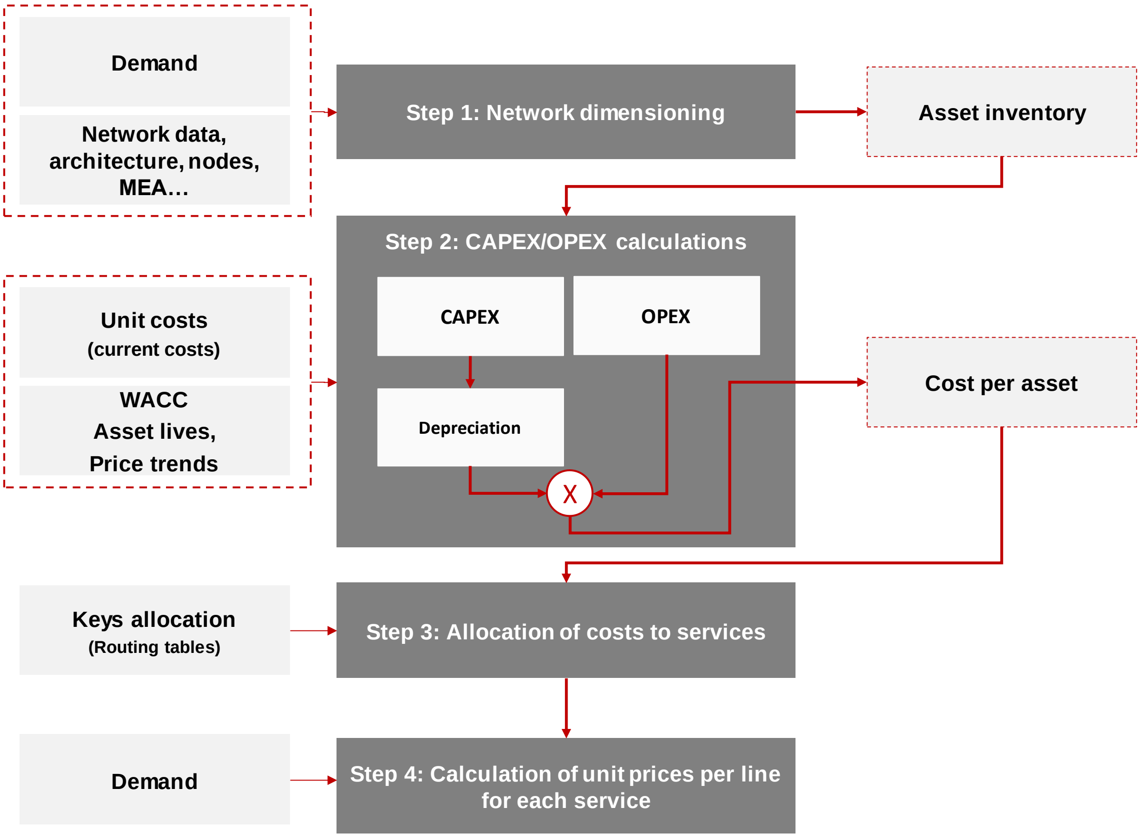
2.2.1 TSLRIC model high level description

While the BBM approach (discussed previously in the section §2.1) and TSLRIC method (usually used in the telecommunication sector), both aim to estimate the cost of providing network based services with the objective to set appropriate cost oriented tariffs, they have, however, substantial differences in terms of modelling approaches.

Unlike the BBM method that relies basically on a top-down logic in assessing costs incurred by the service provider, the TSLRIC method used in New Zealand for the regulation of copper is a bottom-up model whose purpose is to calculate the costs of copper services on the basis of an efficient network using modern technology.

In principle, the TSLRIC approach models the network that a hypothetically efficient operator would build in order to meet its forward-looking demand. Demand data is used as a starting point and an efficient network capable of serving that demand is determined using economic and engineering principles. Globally, the TSLRIC approach could be summarized as follow:

Figure 4 – TSLRIC implementation steps



Source: TERA Consultants

Thus, the TSLRIC approach is fundamentally different from the BBM approach since it is based on a hypothetically efficient operator operating on a dimensioned network that is quite similar to that of Chorus (dimensioned efficiently).

The implementation of the TSLRIC model is performed as follow:

Step 1: Network dimensioning

Like all bottom-up models, network dimensioning is the first step that is performed so as the modelled hypothetical efficient operator could serve a certain demand following a specific network architecture and node structure that is similar to the SMP's one.

The TSLRIC follows a number of structuring principles such as the forward-looking aspect, meaning that the dimensioning and costing should be able to face future changes in terms of:

- Demand: use of the appropriate demand to dimension the network;
- Technology: a Modern Equivalent Asset (MEA) approach is used in the TSLRIC Copper model to better reflect the forward-looking principle and to provide the appropriate build-or-buy signal;
- Efficiency principle: the network dimensioning must be efficient so as to reflect the build-or-buy signal.

The network dimensioning is the key step in a TSLRIC modelling approach since it conditions the asset base (Inventory) to be costed and allocated to services. At this stage, it is important to highlight that the asset base used to calculate copper costs in the TSLRIC model is different from the one actually used by Chorus as a consequence of the fact that the TSLRIC model translates the MEA and efficiency principles. This is a substantial difference with the BBM method expected to be used for fibre costing, for which Chorus fibre inefficiencies could be transferred/included to the fibre RAB **(further discussed in section §2.3).**

The efficiency principle is traditionally an important issue addressed by NRAs in defining costing principles. It appears from the technical paper that efficiency is expected to be addressed only for future fibre expenditure, and not for the past investments.

We believe that this point should be thoroughly addressed in the IM, first because it seems not to be discussed in the technical paper and especially, because it appears that the legislation does not permit any ex-post assessment of Chorus' past fibre capex expenditures when determining the values of the initial fibre RAB.

<u>Step 2: CAPEX/OPEX calculations</u>

Once the network is dimensioned, the TSLRIC model calculates costs (CAPEX/OPEX) associated with each asset dimensioned within the asset base (Inventory).

The network costing is performed considering the inventory calculated previously and the unit costs for each asset. Current costs are considered as the appropriate cost basis, estimated as the replacement cost of each asset. Annualized CAPEX is then calculated based on the appropriate asset lives. Two points need to be highlighted here, as they constitute major differences compared to the BBM approach.

- **The use of the Current Cost Approach in the TSLRIC model to assess the cost base is not consistent with the BBM approach which relies on a Historical Cost approach.** In the TSLRIC model, legacy shared assets are not considered to be reusable: the cost attributed to these asset is therefore its replacement cost (to send a *build or buy* signal) which tends to be higher than the historical cost, since the cost of such assets is mainly related to civil work and there is no technological progress that would drive those costs down. At the opposite, the costs used in the BBM model are the historical costs, because, basically, the cost of such assets should reflect Chorus accounts instead of sending a build or buy signal. This point should be treated carefully (considering the appropriate allocation cost) to avoid any over-recovery of costs especially for legacy shared assets. Hence, the allocation mechanism that should be used in the Input Methodology should reflect this methodological transition between TSLRIC modelling approach and BBM approach, since ignoring it would lead to significantly over-recovering costs.
- The TSLRIC model uses for each asset specific asset lives and the BBM model are not expected to rely on the same data when assessing the useful lifetime of each asset. This point would also be source of inconsistency between the TSLRIC and the BBM model and would generate a risk of under/over recovery of cost.

These points are further detailed in section §2.3.

<u>Step 3: Allocation of cost to services</u>

Once investments and annualized costs are calculated, the TSLRIC model allocates the modelled copper CAPEX (annualized) and OPEX to copper services using the total demand observed in New Zealand.

Since the TSLRIC bottom-up model is mechanically quite detailed, it contains causal allocation keys that are used to allocate total costs to copper modelled services (LLU, SLU, etc.)

Step 4: Calculation of unit prices per line for each service

Based on the total annual costs calculated in the previous step, the model derives the unit prices per line for each service using the active demand, assessed consistently with the passive demand used for the network dimensioning.

2.2.2 Preliminary comments on the approach in the current context

As explained previously, the TSLRIC approach with its bottom-up logic is more complex to implement, but on the other side provides a sufficient level of detail and objective results especially when it comes to cost allocation issues.

The TSLRIC method is based on a number of basic principles including the principles of efficiency, MEA and forward-looking aspects that in some cases appear to be done significantly differently compared to the BBM, which raises questions about the consistency of their respective outcomes.

While both approaches are based on different modelling principles, they are (despite their advantages and disadvantages) each commonly used in regulation. However, the simultaneous use of these two approaches, based on the different methodological choices listed above, raises worrying questions about the basic principle of cost-oriented regulation: cost recovery.

The next section (§2.3) details how the use of the TSLRIC model for copper regulation and the use of the BBM method for fibre could create a risk of double cost recovery and thus harm competitors and competition.

2.3 Issues raised by running both models simultaneously

The coexistence of these two distinct modelling approaches could lead to inconsistencies and double recovery of shared costs used for providing both services based on copper and on fibre.

TSLRIC for copper does not allocate costs that are shared with fibre – because it models one technology only. This is a potential source of over-recovery, as some costs would go 100% to copper under TSLRIC model and then a further share of those same costs would be added to fibre under BBM.

The Commission has already outlined this risk many times in its technical paper:

> *"We consider that one specific area of concerns **for double recovery involving other** services **is when costs are shared across multiple regulated sectors**. For example**, the use of different cost allocation approaches in each sector could risk over recovery**." (Technical paper §302, emphasis added)*

And in the §385.1, stating that:

> *"Legislation proposes **different methodologies** for the FPP and Part 6, **which creates an inherent risk of double or under-recovery**…"." (Technical paper, emphasis added)*

As discussed previously, these two modelling approaches are radically different, whereas they are used to regulate two technologies (fibre and copper) used in the same fixed activity and more importantly provided based on networks that are for a significant part shared.

All shared costs, especially civil work (trenches, chambers, ducts, etc.) that constitutes generally the main part of the access tariff, will be submitted to two modelling approaches that are fundamentally different.

It should be added that the TSLRIC model is not intended to be updated (prices are only expected to be indexed using CPI until at least 2025, when the Commission will review this model). The TSLRIC calculations and the BBM model will then be applied at different time periods, and potentially updated differently, which generates a risk for the consistency of cost recovery.

The analysis previously performed on both the BBM method and the TSLRIC approach, reveals that the differences between the two approaches' principles could lead to an inappropriate recovery of costs and more specifically to an over-recovery, if the BBM is applied without adjustments taking into account the TSLRIC model and understanding of its main principles.

These potential areas of over-recovery of cost are discussed in the following sections.

2.3.1 Cost allocation in the RAB calculation

As presented in the section §2.1, the RAB calculation is one of the main elements that needs to be addressed properly under the BBM to respect the cost recovery principle.

The cost allocation issue between copper and fibre arises both when assessing the CAPEX and OPEX of shared assets:

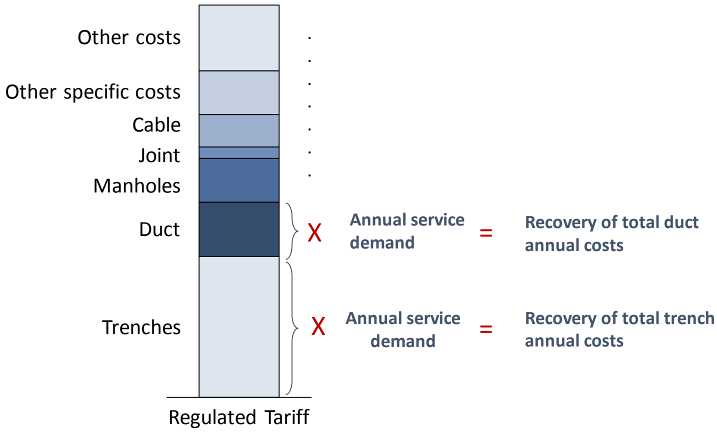
i. **Allocation of CAPEX to be used under BBM**

The RAB value that needs to be considered under the BBM for fibre services costing should include only fibre related assets costs and **the relevant part of shared costs** and exclude any cost related to other network or technology that could be recovered elsewhere.
The identification of the relevant part of shared costs to be attributed to fibre has to be done properly so as to avoid under/over recovery of costs: this is possible if and only if the TSLRIC costing approach/results are taken into consideration in the process of cost allocation, otherwise cost recovery would not be guaranteed.

Example:
Let us consider a simplified situation where each technology provides one service and those two services should recover their costs under the expected new regulation environment (TSLRIC for copper service and BBM for fibre service).
Each regulated tariff is priced so as it recovers its cost drivers and thus each part of the tariff - for example the part associated with trenches - recovers the total annual costs of the trenches, considering the demand observed[2].

[2] For the sake of simplicity, let's assume that the observed and the forecasted demand used in the pricing are the same

Figure 5 – Decomposition of a regulated tariff according to its cost drivers



Source: TERA Consultants

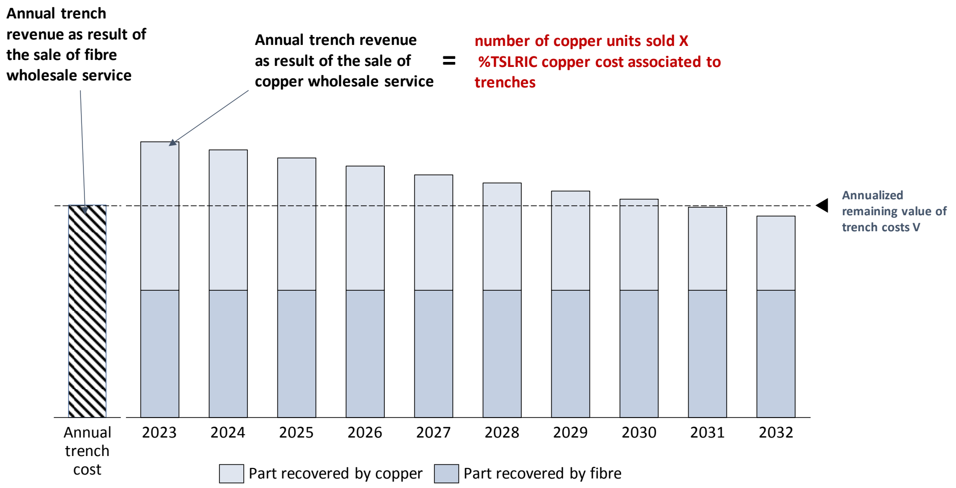
The issue raised here is that in the expected environment, where two costing methods would be used to price each one of the two services, the decorrelation between the two approaches would generate a high risk of an erroneous cost recovery because of the allocation of shared costs in the RAB to fibre services. Let's focus for example on the recovery of one of the shared assets: the trenches.

The application of the BBM approach to cost the fibre service would require the identification of the appropriate share of trench costs to be applied to the fibre RAB. In 2022 (year of the establishment of the new regulation framework) a remaining value **V** of unrecovered trench cost would need to be recovered by both technologies (fibre and copper) over the remaining asset life (let's assume 10 years).

If allocation of the shared cost to fibre is performed independently to the revenues incurred by Chorus from selling its copper services, Chorus would not recover its costs correctly (it would either under recover or over recover them).

In this example, if the RAB associated to trenches is split using an allocation key that is independent from copper, for example assuming that 60% of trench costs are allocated to fibre, revenues coming from the sale of copper services could either under or over recover the remaining share of copper. The share allocated to fibre will be correctly recovered since the maximum fibre allowable revenue will be calculated on this basis.

Figure 6 – Possible consequence of an improper cost allocation[3]

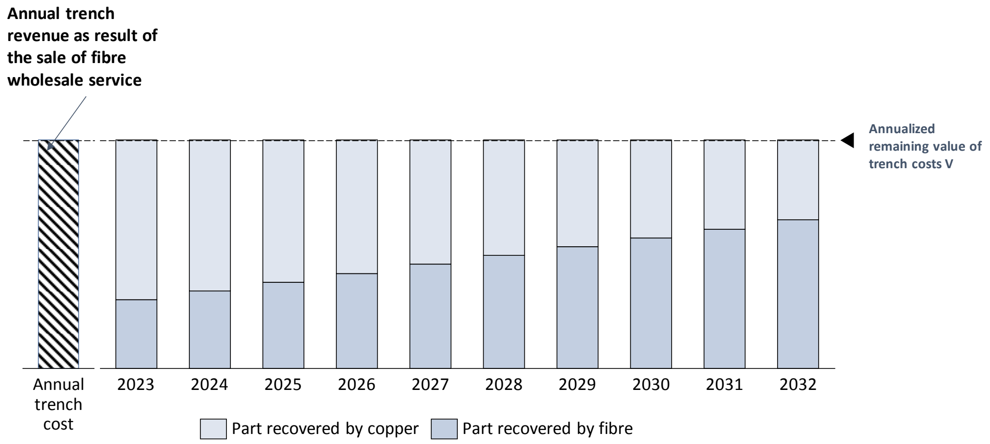


Source: TERA Consultants

This means that the allocation cost process, if undertaken without integrating copper revenues (that are regulated with the TSLRIC), could generate a risk of over-recovery.

This problem would not exist if a single model were used to regulate both technologies:

Figure 7 – Cost recovery in the case of a single model



Source: TERA Consultants

To sum up, the main risk of over-recovery of costs described in this section is to over allocate more shared costs to fibre than should be allocated (since fibre prices would be calculated on this basis) while copper TSLRIC prices continue to recover these same costs based on the TSLRIC cost allocation.

ii. **Allocation of OPEX to be used under BBM**

It should be noticed that, similarly, to the CAPEX allocation between copper and fibre (discussed previously), the operational expenditures should be properly allocated between copper and fibre so as not to over recover (by the same mechanism) OPEX associated with shared assets.

[3] The cost allocation key is considered constant over time for the sake of simplicity. Even with a variable key allocation (independent from Copper), the problem remains the same…

2.3.2 Differences in costing approach principles

The network costing approach is an important element in determining the relevant price of a regulated service.

The new regulatory framework envisaged by the Commission would face a major issue reconciling the main principles used in the TSLRIC modelling with those expected in the BBM.

Many areas of inconsistencies between principles used could be identified and are discussed in the following paragraphs:

i. Efficiency principle in TSLRIC approach

One of these principles is the efficiency aspect of the modelled operator: the TSLRIC approach advocates this aspect as a major principle in setting a regulated tariff for many reasons:

(i) to send the appropriate build-or-buy signal;
(ii) to incentivize the operator to be the most efficient possible and;
(iii) to avoid access seekers (and mechanically end-users) from paying for access providers' inefficiencies.

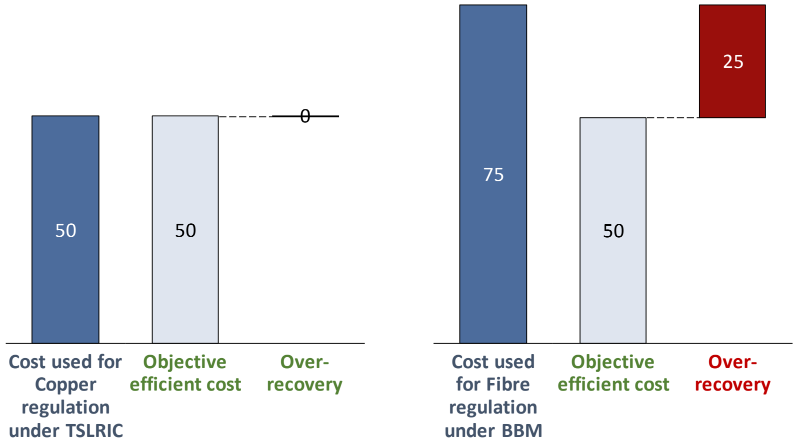
The implementation of the BBM approach should seek an equivalent level of efficiency compared to that used in the TSLRIC model. The RAB that is expected to be used under the BBM would include the initial value (that includes also financial losses) and might be a source of inefficiency transfer from copper to fibre.

This point is raised since possible inefficiencies could have been recorded by Chorus when deploying its shared infrastructure (and that have been dealt with, reasonably, in the TSLRIC model) and would be included in the fibre RAB, which would constitute an over-recovery of the exact cost needed to provide the service. In other words, let's assume that the relevant trench costs needed for both technologies is estimated by the Commission to be 100 (assessed through the TSLRIC model, excluding (as recommended) any inefficiencies) and for the same scope, Chorus recorded 150 (including inefficiencies).

When establishing the relevant RAB for the BBM approach, let's assume that a 50%/50% cost allocation key is identified as relevant.

Figure 8 – Over recovery risk due inefficiencies

	TSLRIC (excl. inefficiencies)	BBM (incl. inefficiencies)
Total shared trenches costs: Copper + fibre	100	150
Fibre (50%)	/	75
copper (50%)	50	/
Objective cost reference	50	50
Over-recovery (inefficiencies considered)	0	25



Source: TERA Consultants

Then:

- Copper services, would bear 50 while the objective cost basis (established by the Commission as the relevant efficient cost) is 50, and in this case no over-recovery would be considered in the regulated copper price;
- Fibre services, would bear 75 while the objective cost basis (established by the Commission as the relevant efficient cost) is 50, and in this case an over-recovery of 25 would be included in the regulated fibre price as a direct consequence of inefficiencies;

Based on that, it appears that inefficiencies avoided by the Commission when setting the objective cost basis in the TSLRIC model would be transferred to fibre through the RAB.

Transferring inefficiencies from copper to fibre would have negative consequences not only on access seekers but also on end-users and on broadband activity in New Zealand.

ii. MEA principle used in TSLRIC approach

The TSLRIC modelling approach pursued was based on the MEA principle, which is best practice for dimensioning forward-looking bottom-up models.

This means that the network modelled is based on the most cost-efficient technology (architecture) across the lifetime of the service. A point-to-point (PtoP) architecture of the access network is considered in the TSLRIC model, meaning that one fibre is dedicated from each central office (MDF) to the premise (End User).

We understand that this is not the case for the actual Chorus fibre network deployed which is based on a GPON architecture with a splitting ratio of 1: N (this means that for each set of N end-users, only one fibre is rolled out from the Central Office to the first splitter).

Based on that, two references of technical architectures are used in the New Zealand context while they are radically different in terms of underlying principles. This raises an important concern if a causal and technical allocation key is intended to be used in the RAB allocation whether to use the real architecture (GPON) or the modelled one (PtoP).

This leads to a situation where two cases are possible, for example for trench allocation:

- If the actual architecture implemented by Chorus (GPON) is used as the reference architecture, this would be inconsistent to the implemented TSLRIC approach where the PtoP is used, leading to a mis-recovery of costs across the two models;
- If the modelled architecture in the TSLRIC model is used, where the PtoP architecture is implemented and thus trenches occupy 1 fibre for each end-user instead of N end-users then the allocated share to fibre would be higher than it should be technically. This means that the RAB associated to fibre would be over-estimated, leading once again to a mis-recovery of costs across the two models.

In reality, the inconsistency between the TSLRIC modelling and the network reality would make the implementation of a pure causal (and technical) allocation key not only complex, but also generates a mis recovery of costs.

We believe that relying on such a pure technical/causal allocation keys would not be the solution to avoid mis recovery of costs:

- First, because of the disconnection between the reality and the TSLRIC modelling choice, making the choice of one of the other allocation key difficult and complex to objectify, and;
- Second because, anyway, this would generate the same issue of cost recovery discussed in §2.3.1.

As discussed in §2.3.1, we expect that the choice of an allocation key that is independent from the copper business may create a distortion in the cost recovery.

iii. The CCA principle (no reuse) used in TSLRIC approach is not consistent with the HCA cost standard expected under BBM

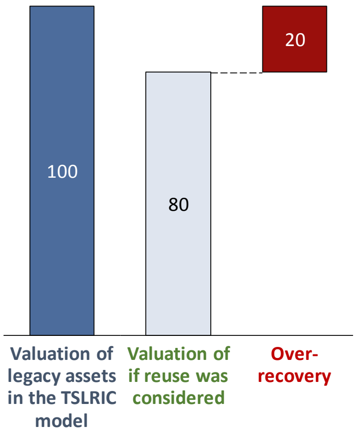
The analysis of the hypothesis behind the TSLRIC model reveals that FPP copper tariffs were calculated based on the use of the Current Cost Approach as the cost basis. This means that all assets composing the asset base are costed as if they are newly built, which means that legacy shared assets, especially civil engineering assets, are not considered reusable in the TSLRIC model.

The use of the CCA cost standard (in terms of modelling choice) is not consistent with that of the BBM approach, which would be mainly based on HCA costs.

This means that civil engineering costs (cost of trenches, ducts, manholes, poles etc.) when treated as newly built, are higher than when taken directly from the accounts and this modelling approach needs to be taken into consideration in the evaluation of the RAB of the shared civil engineering assets, by considering the already-recovered cost effectively generated by the units sold (by Chorus) of the copper products.

In other words, let's assume that legacy shared civil engineering assets are valuated in the TSLRIC model at 100; this value considers that these assets are newly built considering their current costs. This is a modelling choice, but in reality, legacy shared assets are reused and their valuation should reflect the reality that they are partially depreciated.

Figure 9 – Over recovery risk due to reuse cost principle



Source: TERA Consultants

If the reuse and past depreciation were taken into account, valuation of legacy shared assets would lead to a lower value. If it is 80, this means that TSLRIC copper prices already includes 20. When dealing only with the copper bottom-up TSLRIC valuation it may be a choice, but when on the other side a top-down BBM model is introduced in order to ensure covering all costs, that contributes to over-recover Chorus's network and needs to be dealt with when assessing the fibre RAB so as to neutralize this effect.

The implementation of the Input Methodology (of the BBM method) should include the reconciliation of such modelling principles between the TSLRIC approach and the BBM, because if, for example, this point is not treated carefully (during the assessment of the remaining unrecovered part of each shared asset) would generate an over-recovery.

iv. Asset lives used in both models would generate inconsistencies if different values are used for the same asset

In addition to all inconsistencies that could be generated by the differences in the two approaches, in the technical paper, the Commission proposes to use different asset lives for assets in the RAB than were used in the TSLRIC model.

It seems to be intended not only to use different asset lives than those used in the TSLRIC model but also to adjust from the accounting value. Thus, the BBM model would include asset lives that are different both from accounting values (adopted under GAAP) and from those used in the TSLRIC model.

Using different asset lives, for the same assets, than those considered by the Commission in the TSLRIC model would generate significant consequences both on results and on the simplicity of implementation and audit of the BBM model.

Shortening asset lives, for example, would mechanically lead to significant impacts on calculated costs by generating higher wholesale costs.

Moreover, manipulating asset lives would add an additional layer of ambiguity to a new regulatory context that is already complex and complicated to reconcile.
We believe that setting appropriate asset lives should be justified by operational rationales, which should have been the case in the TSLRIC model, thus any asset lives different from those used in the TSRLIC model would generate additional ambiguity and difficulties in auditing the BBM model.

This point is outlined in this note since it could have indirect consequences on the cost recovery.

We believe that the Commission should seek to reconcile as much as possible the hypothesis behind the two approaches to avoid divergences that would be the main sources of mis-recovery of costs.

3 Recommendations

As discussed in the previous section, the switch from the TSLRIC modelling approach to BBM for fibre services, while copper services remain regulated using TSLRIC model, is theoretically possible to implement but creates significant risks regarding double recovery of cost. This is contrary to the main regulatory objective of cost orientation and has significant impacts on competition and on overall benefits to end-users.

The Commission is aware of this issue (§383-387) as highlighted by Spark and Frontier in their submissions. However, the Commission:

- Considers it would be impractical “to fully ensure or to fully demonstrate” (§385) that there is no double recovery;
- Considers its approach, based on ABAA, is “the appropriate choice to reduce the risk of double or under-recovery” (§386).

We understand that the Commission proposes to rely on the allocation method it has chosen in the framework of the BBM fibre model to avoid double recovery, focusing on the ability of the BBM to take into account a change in the mix of customers (between copper and fibre) (§386.2).

However, the risk of double recovery of cost exists and is inherent to using two different modelling approaches with different principles to regulate two technologies, closely related to each other as they use the same shared network.

This risk appears to be insufficiently dealt with in the technical paper. It is the major issue of applying the BBM approach since the difficulty here is not in the application of the BBM approach to New Zealand telecommunication sector (this has already been done in other countries) but rather the management of the coexistence of two different models.

The only way to successfully implement the BBM is to respect the main costing principle in cost-oriented regulation, which is the exact recovery of cost, avoiding any over or under recovery.

In order to avoid - or at least to mitigate - this double recovery, some issues should be addressed, in particular considering the principles exposed by the Commission in its consultation document.

This implies closely controlling how the models are applied and putting in place the appropriate consistency checks verifying there is no double recovery.

As the TSLRIC model for copper and the related copper tariffs are already in place, this control and the tools allowing to avoid double recovery have to be introduced with the BBM model.

As the Commission already exposed its emerging views on the application of the BBM in its consultation document, the analysis of the solutions and the building of recommendations developed in this paper will take into account the Commission’s emerging views when it’s useful.

According to this framework and methodology, the following issues are identified and should be addressed as a priority in order to avoid or at least to mitigate the risk of double recovery:

- The general non-prescriptive nature of the consultation and its potential impacts (§3.1);
- The necessity to ensure consistency in the granularity of cost categories used in each model (§3.2);
- The adjustments to the RAB values for deregulation (§3.3);
- The necessity to monitor and ensure the consistency of the total cost recovered from copper and fibre regulated services (§3.4).

3.1 Considerations on the general non-prescriptivity nature of the consultation

From a general methodological point of view, one of the noticeable features of the Commission's emerging views is in the fact that they propose not to be prescriptive. This methodological choice and its potential impacts, including double recovery, have to be analysed.

(1) In its consultation document, the Commission frequently explains that the consultation is not prescriptive - it will not set "ex ante" prescriptive rules to be applied by the regulated operators when applying the BBM.

This choice of a non-prescriptive or "low-prescriptive" approach is firstly expressed as a general principle. This common approach is clearly expressed at the beginning of the discussion related to asset valuation, in the "Key issue 1: High-level features of the asset valuation approach". Instead of a prescriptive approach the Commission choses to use a principle-based approach. The Commission writes[4]:

> *"We therefore propose a principles-based regime with more general 'rules' supplemented with detailed rules to meet specific requirements. […]*
>
> *164. It appears impractical to produce prescriptive rules given the dynamic situation addressed by Part 6. More detailed rules can be developed to deal with certain situations, assets or legislative directions (eg, the initial loss asset) by exception."*

This choice is then expressed many times and about many specific topics. For example when discussing the specification of asset granularity in the RAB (see §3.2)[5], the allocation of costs between different types of regulated FFLAS[6], the allocation between FFLAS and other services[7], the calculation of the initial RAB[8] and the allocation of operating expenses[9] etc…

The Commission points out that a low level of prescription brings flexibility. This flexibility would allow it to choose a valuation method or an allocation method that is workable in practice: it would remove the risk of the application of the model being finally locked by processes that are unworkable in practice.

However, this statement and the assumed flexibility of a low level of prescription should be challenged:

- Firstly, the low level of prescription creates uncertainty about the rules that will be finally applied in practice when the costs will be modeled. Therefore, the possibility that the results may lead to double recovery due to the coexistence of tariffs set according to the BBM for fibre and to the TSLRIC for copper cannot be dismissed;
- Secondly, the assumed flexibility may be very deceptive.

  The flexibility that is highlighted by the Commission is the flexibility in the application of the BBM. The Commission points out that with a low level of prescription, i.e., in other

[4] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, p. 12, §163-166

[5] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §177

[6] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §253.2.1 or 329

[7] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §283 or 300

[8] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §359

[9] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §382

words, with few “ex-ante” there is more flexibility for the regulatory authority and for the operator as there will be room for changes and choices.

However, the approach based on a low level of prescription could lead to less flexibility for the regulation and for the Commission in the future. For example, if a low level of prescription results in a model that provides a low or inaccurate level of granularity, this may hamper or even prevent some controls or evolutions of the regulation: it may limit the ability to verify that costs are inappropriately allocated to some services, or the ability to isolate new costs/products not initially identified (if new products are regulated or in case of partial deregulation), etc. Hence, the low-level of prescription could have an opposite effect leading to less flexibility and limited power for the commission to deal with future regulated issues, which is contrary to the assumed flexibility.

In addition, and more generally, it should be noticed that the consultation document itself indirectly points out a potential negative impact of its general non-prescriptive principle. Indeed, when justifying its choice of a relatively low level of prescription and few process rules, the Commission writes that this approach recognizes the information asymmetry that exists when developing the IM[10], i.e. that the regulated operator benefits from more information than the regulatory authority. If the existence of an asymmetry is identified, the regulatory authority should do what is possible in order to reduce this asymmetry. Acceptance of an asymmetry seems to be a strange and dangerous starting point when choosing the methodology and justifying the BBM methodology.

A general non-prescriptive principle for the BBM model, which is supposed to bring flexibility but could actually limit the flexibility of the regulation in the future, generates risks, including risks of double recovery that should then be closely monitored. A major example of the consequences of the uncertainty caused by the non-prescriptiveness deals with the granularity of the model.

3.2 Ensure consistency in the granularity of cost categories used in each model

The two cost models (the BBM for fibre and the TSLRIC for copper) will produce two valuations of the same shared costs. In practice, in order to ensure that there is no double recovery of these costs it will firstly be necessary to be able to compare these costs. For this reason, the consistency of the granularity of the cost categories existing in the two models will be a major issue.

This section:

- Explains why the granularity of cost categories is a key issue in order to ensure the absence of double recovery when two distinct cost models exist and then what is recommended **(1)**;
- Points out that the current views expressed by the Commission in its consultation document are not clear enough as they mainly rely on the principle of not being too prescriptive, which generates risks for the future **(2)**;
- Briefly presents, as a reminder, the cost categories already used in the TSLRIC model that should be taken into account in the BBM model **(3)**.

(1) Following the introduction of the BBM model for fibre, two models will produce as outputs two distinct cost modeling of assets and expenses, which costs are then taken into account into the regulated tariffs designed in order to cover these costs.

[10] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §165.1

Controlling for double recovery requires verifying that no cost is recovered twice, i.e. one time through a copper tariff generated by the TSLRIC model and a second time through a fibre tariff generated by the BBM model. Practically, it means that it is necessary to control that the sum of costs covered by both regulated tariffs is not superior to the total regulated cost basis.

As costs that are specific to copper or to fibre will only be modeled and taken into account based on the relevant model (e.g. the BBM model for fibre specific costs), the double recovery may only emerge from costs that are shared between copper and fibre. It will then be necessary to isolate shared cost categories.

Furthermore, the control of the absence of a double recovery will be real and accurate only if it is possible to analyse costs recovered with detailed enough cost categories. If categories in the output of the model are too large, i.e. if they aggregate too much categories, it will not be possible to identify where double recovery occurs.

And if the cost categories are not the same in both cost models (BBM and TSLRIC) this will prevent even category-by-category control. Similarly, if there are too many differences between both, this could lead to a very limited overall control that will not be really effective. Verifying for any shared assets that the total cost is the same and *a fortiori* that there is no double recovery requires that costs generated by the two models for these assets are able to be able to assess.

Ensuring the BBM model granularity is at least the same as the granularity of the TSLRIC model will also have supplementary benefits. More fundamentally, granularity is necessary to appropriately model and monitor the diversity of assets and costs. It is not appropriate to aggregate assets with very distinct characteristics. It is in particular a sensitive issue:

- For the asset valuation step: in particular, as price trends and asset lives differ between assets and have a direct impact on asset values and on amortization, it is important to reach a sufficient level of disaggregation of assets in order to avoid mixing assets with different and a fortiori opposite characteristics. For example, civil work and cables should not be mixed as the first category may have a longer asset life than the second and because they often have opposite price trends when considering fibre cable: in most cases civil work costs, that are mainly derived from labor costs, tend to rise through time, whereas the cost of fibre cables tends to decrease;
- For the allocation step: allocating shared costs to specific services means determining allocation factors. Establishing accurate, clear and easily justifiable allocations by a causal link is easier when using meaningful and detailed cost categories than with large, aggregated and heterogeneous cost categories.

The TSLRIC model is already based on categories of assets and related costs that are defined in order to be mostly homogeneous. Inside each category asset lives and prices trends are the same. And as categories are based on the functions in the network too, they are linked with allocation factors that are closely linked with causality principles and that are transparent.

For all these reasons, the granularity of the new BBM should be at least the same as the granularity of the TSLRIC model. The BBM model should use the same cost categories and/or sub-categories that are derived from the TSLRIC model initial categories, in order to allow to control the absence of double recovery. In other words, for any cost category A existing in the TSLRIC model, the BBM model should use A or subcategories included in A, i.e. for example categories A1, A2 with:

- A1 and A2 that are distinct (no element is shared between A1 and A2);
- The aggregation of A1 and A2 is A (in mathematical terms $A1 \cup A2$).

Figure 10 – Illustration of the necessary level of granularity for both models

TSLRIC model	**A**	**B**		**C**
BBM model	**A**	**B1**	**B2**	**C**

Source: TERA Consultants

(2) According to its consultation document and as seen previously (see §3.1), the Commission has decided not to be prescriptive about the granularity level of aggregation to be used in the model.

The Commission explains its main principle is not to be too prescriptive, because its main concern is to avoid an impractical process[11]:

> *"177. A highly prescriptive approach to asset granularity is likely to be impractical, given competitive issues, technology evolution and complexity of services.[114] The level of asset granularity will also need to address cost allocation requirements."*

Nevertheless, the Commission feels that there is a need for some disaggregation and that some rules are necessary in order to get a satisfactory disaggregation from the operators, as it considers prescribing some additional rules and presents in the annex of the document potential disaggregation level[12]:

> *"179. Our approach is to prescribe some specific but limited disaggregation, with a principle that the RAB incorporates appropriate disaggregation to meet current and future needs. See Attachment C for potential disaggregation levels."*

In this context, there is a risk of regulated operators determining the level of disaggregation. They could be incentivized to propose a quite low level of granularity that lowers transparency and increases information asymmetries.

The Commission's emerging views should be amended in order to ensuring the BBM model granularity is at least the same as the granularity of the TSLRIC model.

From a practical point of view these principles will have to be introduced, in the IMs for the BBM, without any change in the methodologies used for the TSLRIC model. This IM will have to indicate the detailed cost categories of the TSLRIC model (see examples thereafter) as a reference.

This granularity will have to be taken into account for the asset valuation as well as for the cost allocation steps, in order to be able to be fully able to lead all the analysis thereafter, including the control of double recovery.

(3) The level of granularity (recalled bellow) used in the TSLRIC model reflects, actually, the operational needs as well as transparency principle. It relies on many categories and subcategories within each category of cost: for example, there are categories for copper cables, copper joints, trenches and for poles, but copper cables are in addition divided into different sub-groups (underground, overhead…) (see Figure 11).

[11] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §177

[12] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §179

Figure 11 – Illustration of the TSLRIC global cost categories

Assets	Description	Size	Asset life
		#	years
Copper cables			
1	4 pairs overhead copper cable	4	14
Fibre cables			
20	2F fibre cable	2	20
Copper joints			
34	Jointing closure for 4 pairs overhead copper cable	4	14
Fibre joints			
51	Jointing closure for 2F fibre cable	2	20
Distribution points			
65	Copper cable terminal (overhead)		14
Ducts			
69	50 mm duct		50
Trenches			
72	Small trench (for one 50 mm duct)		50
Poles			
77	Pole		20
Manholes			
81	Urban manhole		50
Street cabinet			
83	Passive street cabinet XXXX		14
MDF			
85	Small MDF	2 000	20
ODF			
88	Small ODF	2 000	20
FWA base stations			
91	Spectrum		17
Submarine links			
95	Landing station for submarine links		20
Microwave links			
97	MW Site		14
DWDM links			
98	DWDM Site		10

Source: TSLRIC model

Even subcategories are in some cases divided into other categories. For example, there are categories for copper cables depending on the cable size and/or of its nature (underground or overhead cable).

Figure 12 – Illustration of the TSLRIC sub-categories

Assets	Description	Size	Asset life
		#	years
Copper cables			
1	4 pairs overhead copper cable	4	14
2	10 pairs overhead copper cable	10	14
3	15 pairs overhead copper cable	15	14
4	25 pairs overhead copper cable	25	14
5	50 pairs overhead copper cable	50	14
6	4 pairs UG copper cable	4	20
7	5 pairs UG copper cable	5	20
8	7 pairs UG copper cable	7	20
9	15 pairs UG copper cable	15	20
10	25 pairs UG copper cable	25	20
11	50 pairs UG copper cable	50	20
12	100 pairs UG copper cable	100	20
13	200 pairs UG copper cable	200	20
14	300 pairs UG copper cable	300	20
15	400 pairs UG copper cable	400	20
16	800 pairs UG copper cable	800	20
17	2000 pairs UG copper cable	2000	20
18	2 pairs lead in overhead copper cable	2	14
19	2 pairs UG copper cable	2	20

Source: TSLRIC model

Our recommendation is that the granularity of the BBM model should be at least the same as the granularity of the TSLRIC model in order to allow to control the absence of double recovery.

3.3 Adjustments to the RAB values for deregulation

The BBM entails a quite complex methodology mainly because of its top-down nature. Because it wants to start from the historical account and then to derive a specific calculation for the regulatory control, a major step is the determination of the RAB.

This RAB constitutes a kind of basis that is then used as a starting point for the yearly calculation of the MAR. However, the perimeter of the regulation may change: for example, a service may not be regulated anymore. This raises the question of whether and how the RAB should be adjusted.

We understand that the Commission is still considering what adjustments, if any, are required where services are deregulated[13].

If the Commission were to determine an adjustment, it would need to take in to account deregulation across copper and fibre cost models. For example, where shared costs have been allocated with a standard allocation factor, the allocation factor may also change to fit properly and exactly the perimeter of regulated services.

Accordingly, we note that adjustments to RAB values for deregulation may lead to an over-recovery. This would need to be considered further in order to address simultaneously both objectives, i.e. avoiding over- and under-recovery.

3.4 Monitor and ensure consistency of the total cost recovered from copper and fiber regulated services

As a crosscheck to augment the more detailed cost category reporting, the absence or existence of double recovery can also be tested by calculating the total cost recovered from copper and fibre regulated activities. This methodology, which does not depend on the cost category information, will be an important cross-check for the Commission.

In the context of cost orientation, double recovery occurs when the total cost finally recovered through tariffs is higher than the initial total cost that had to be covered. Controlling the absence of double recovery then entails comparing:

- The total cost (of assets) allocated to regulated (cost-oriented) services **(A)**,
- With the total revenue generated by regulated services: in the current case, this revenue will be the sum of the revenue generated by regulated copper tariffs, calculated based on the TSLRIC model, and of the revenue generated by the regulated fibre tariffs, calculated based on the new BBM model. As these tariffs are cost oriented, it will be equivalent to consider the revenue or the cost allocated to these services **(B)**.

(A) The first step consists of determining total cost (of assets) allocated to regulated services that has to be covered at the end.

It has been decided to regulate fibre based on historical costs (through the BBM). Therefore, it is necessary to consider the cost calculated according to the BBM and not to the TSLRIC method.

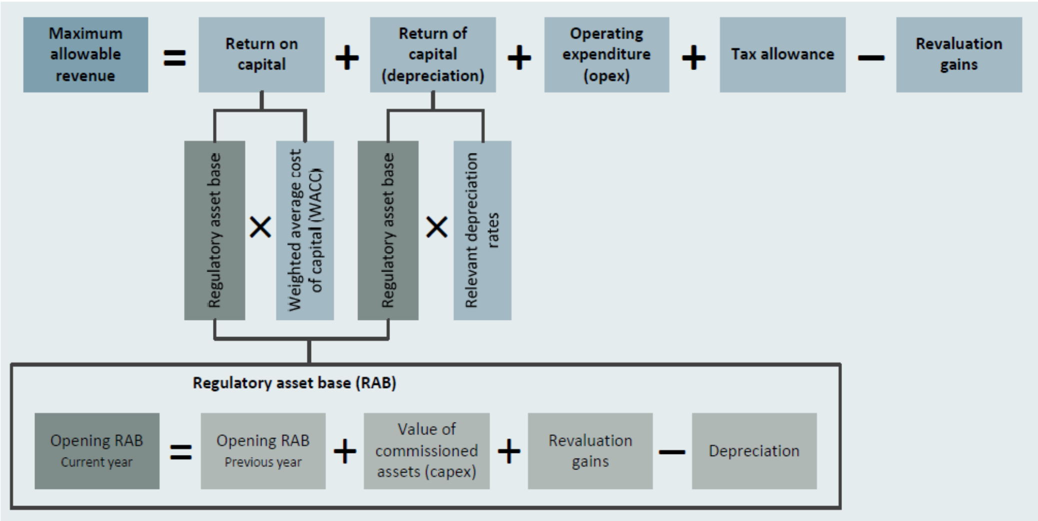
In addition, as the cost orientation decided by the regulation deals only with the regulated activities or offers, the perimeter of this total cost should be limited to the total cost covered by the related tariffs, i.e. the total cost excluding the costs covered by non cost-oriented services. As there is by definition no cost-orientation obligation for non cost-oriented services the way the regulated operator covers its costs for these services does not need to be controlled for.

The total cost considered should then be equal to the total cost of cost-oriented services, including copper and fibre.

[13] See ComCom, *Fibre regulation emerging views: Technical Paper*, 21 May 2019, §245-247

Considering the BBM, determining this total cost will in practice consist of applying the same methodology as the one presented by the Commission for the fibre access network but applied to all cost-oriented services (copper and fibre). On this broader set of services/assets the RAB will be determined and then the annual MAR taking account the return on capital, depreciation, OPEX, tax allowance and revaluation gains (cf. Figure 13). This MAR may be noted $MAR_{regulated}$.

Figure 13 – Calculation of the maximum allowable revenues under BBM



Source: ComCom, Fibre regulation emerging views: Summary Paper, 21 May 2019, p. 12

This calculation will be possible in practice as:

- It is based on the same methodology as the BBM that will be used for calculating the cost of fibre;
- It will be based on the same cost categories as the BBM model for the cost of fibre;
- As the BBM used for fibre starts from the accounting data including all the costs for all the services, data for copper will be available;
- The allocation factors (for determining the RAB, past losses, etc.) will already be available, as they will have been defined for the calculation of fibre.

(B) The second step will consist of determining the costs recovered from the copper regulated tariffs, on one side, and from the fibre regulated tariffs, on the other side.

As set out above, the total cost covered by the tariff of a cost-oriented service is by definition equal to the tariff.

The amount of cost covered by the tariff on a service for a given cost category (for example trenches or cable costs) is known too, as it corresponds to the amount of cost of this cost category that is taken into account in the calculation of the final unitary tariff of the services.

Based on these elements, the total cost covered by a regulated service for a given cost category can be evaluated based on the amount of cost of this cost category by unit multiplied by the number of units of this service. For example, if we note $\%C_i$ the part of cost associated to a cost category for a service (1 to N) in the TSLRIC tariff and N_i the number of units sold for each copper cost-oriented service i, the total cost covered by copper cost-oriented services (C_{copper}) can be calculated using the following formula:

$$C_{copper} = \sum_{i=1}^{N} \%C_i \times N_i$$

This principle can be applied to all types of services, for copper (using the unitary tariffs from the FPP and the TSLRIC model) and for fibre (using the unitary tariffs provided by the BBM model). The total cost covered by cost-oriented tariffs ($C_{regulated}$) will then be equal to the sum of the total cost covered by copper cost-oriented services (C_{copper}) and the total cost covered by fibre cost-oriented services (C_{fibre}).

$$C_{regulated} = C_{copper} + C_{fibre}$$

These calculations may be achieved ex ante, based on forecasted volumes, and/or ex post, based on sales observed.

The total cost covered by cost-oriented tariffs ($C_{regulated}$) that calculated this way can then be compared to the total cost that has to be covered (MAR), valuated during the first step **(A)**.

As the MAR is calculated on a yearly basis in the BBM, this comparison will have to be achieved year by year too. Then, $MAR_{regulated\ t}$ and $C_{regulated\ t}$ have to be considered.

The results will then allow to observe if there is an over-recovery or not.

This calculation could technically lead to $C_{regulated\ t} < MAR_{regulated\ t}$, which may let think that there is an under-recovery. However, such a situation will actually mean that the copper MAR/cost covered by copper under the BBM is superior to the cost calculated with the TSLRIC, as the fibre share of the cost is calculated under the BBM. As the TSLRIC methodology has been chosen in order to model an efficient operator building a modern equivalent of the network, there could be a gap between the cost of this operator and the BBM cost for copper. However, this gap should not be compensated for when undertaking the double recovery cross-check as doing so would compensate for inefficiencies.

Rather, if the calculation leads to $C_{regulated\ t} > MAR_{regulated\ t}$, this will indicate that there is an over-recovery or double recovery of costs.

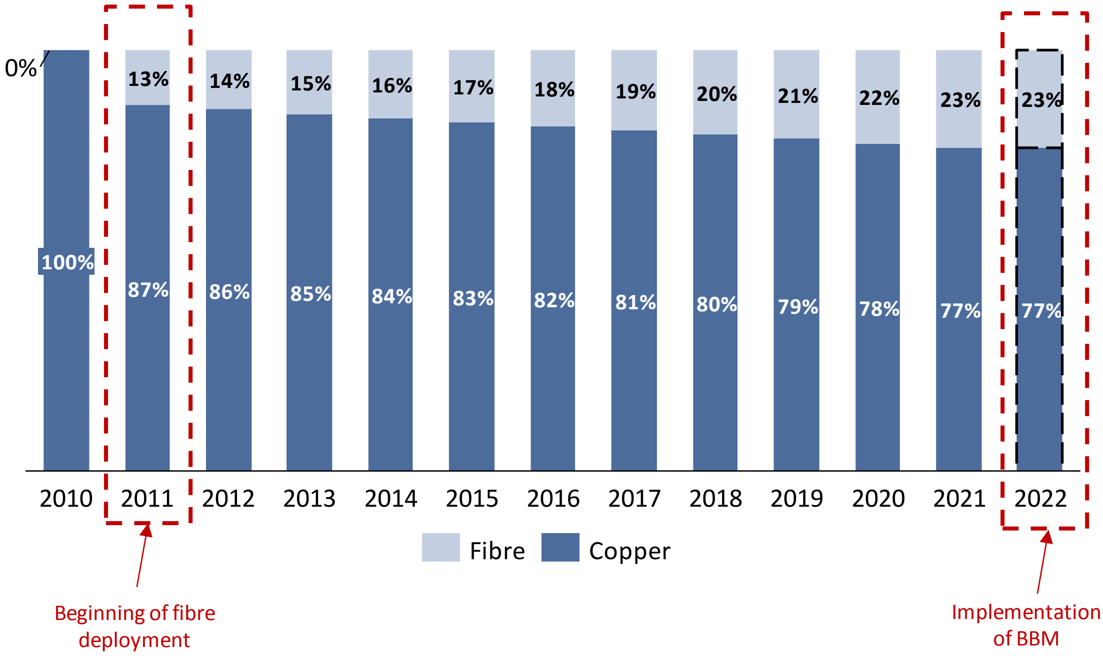
The solution that should be applied in order to adjust fibre tariffs based on the BBM from this double recovery is to calculate, when there is double recovery, an adjusted MAR for fibre (adjusted $MAR_{fibre\ t}$):

$$Adjusted\ MAR_{fibre\ t} = MAR_{fibre\ t} - C_{copper\ t}$$

This is the simplified formula in case there is only one type of regulated service on fibre. If many cost-oriented services coexist on fibre, the adjustment has to be shared, for example based on the share of the total revenue among regulated services on fibre.

This method will ensure that the total cost that has to be covered by cost-oriented services is always fully covered. Due to the progressive switch from copper to fibre the share allocated to fibre regulated services will progressively increase, before and after the implementation of the BBM.

Figure 14 – Illustration of the impact of the transition from copper to fibre for the allocation of share costs



Source: TERA Consultants

As explained above, the calculation will be made ex post, i.e. at the end of the year, based on observed volumes.