



ONO's response to the European Commission consultation on a draft Recommendation on the Regulatory Treatment of termination Rates

10 September 2008

ONO is the leading alternative provider of telecommunications, broadband Internet and pay television services in Spain and the only cable operator with national coverage. ONO offers its services to almost 1.9 million residential cable customers through its own new optical-fibre and coax-cable network which gives direct access to nearly seven million homes across Spain, including the nine largest cities. With a customer base of more than 1.6 million in telephony, 1.3 million in Internet and 1.0 million in pay TV, ONO is the principal competitor to the incumbent telecommunications and pay television operators in Spain. For the second Quarter 2008, ONO generated revenues of €1,632 million and EBITDA of €716 million, on an annualized basis¹.

ONO welcomes the opportunity given by the European Commission (EC) to comment on its draft Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (the Draft Recommendation) as the harmonization of the regulatory treatment of fixed and mobile networks is key to promoting network competition and the development of efficient fixed-mobile converging services in the Single market.

I. Introduction

The EC Draft Recommendation on the regulatory treatment of termination rates aims at establishing a harmonized approach to issues such as the distortions created by high mobile termination rates (MTR), the calculation of both fixed and mobile termination rates based on a LRIC bottom-up model, the adequate treatment of common and non-traffic related costs in fixed and mobile LRIC modelling, the need to converge to

¹ More information about ONO's key statistics and financial performance at: <http://www.ono.es/pdfs/pdfsinvestor/ONO%20Q2%2008%20Full%20results.pdf>



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symmetric termination rates within a given time scale, etc. ONO, as explained in this submission, supports this approach, although would also like to contribute some comments that seek to improve the current Draft proposal.

In particular, ONO believes that even though the Draft Recommendation embodies a sound conceptual and methodological approach to the issues pointed out above still requires further elaboration on such aspects as the analysis of the distortions originated by the asymmetric regulatory treatment of fixed and mobile termination rates, as we explain in section II of this submission, We certainly believe that fixed-mobile asymmetries introduce distortion in competition as they allow very significant cross-subsidies from a group of competitors (fixed operators) to another (mobile operators) and places obstacles to the emergence and expansion of converging services..

Section III is devoted to comment on the economics principles underlying the Draft Recommendation, such as the use of the long term avoidable costs of providing termination, resulting from a bottom-up LRIC model, as the costing principle to set regulated termination rates; and the rationale for the recovery of common and non-traffic sensitive costs trough (competitive) services other than termination. Some reflections on the likely effects of the proposed changes is also provided in this section.

In section IV, we aim at providing some insights about the practical implementation of the costing principles contained in the Draft Recommendation as far as bottom-up LRIC modelling is concerned. We will focus on mobile termination rates mainly for two reasons: 1.) when talking about F-M termination rates asymmetries, it is currently high (above-cost) mobile termination rates -as compared with significantly lower fixed termination rates- the main source of distortion; and 2.) the principles contained in the Draft Recommendation will introduce more significant changes in mobile bottom-up LRIC modelling than in fixed modelling. However, some comments on the adequate definition of scale and of coverage for both fixed and mobile networks and are also provided.

Section V contains some concluding remarks.

II. Competition distortions created by high MTR and F-M asymmetries

The Draft Recommendation tacitly recognizes that the competition problems raised by TR asymmetries are not limited to F-F and M-M asymmetries, but also extend to the sizeable asymmetry existing between high mobile termination rates and much lower fixed termination rates. Therefore, recital (3) of the Draft Recommendation points out that:

*“Significant **divergences in the regulatory treatment of fixed and mobile termination rates create a fundamental distortion between fixed and mobile markets and consumers.** Furthermore, the absolute level of mobile termination rates remains high in a number of Member States compared to those applied in a number of countries outside of the European Union, and also compared to fixed termination rates generally, thus continuing to translate into high, albeit decreasing, prices for end-consumers.” (emphasis added)*

However, it fails to explicitly conclude on the distorting effect that this asymmetry exerts on competition, particularly on fixed-mobile competition, and limits itself to highlight the negative impact of high absolute MTRs on retail prices.

The accompanying memorandum to the Recommendation is however more explicit. In section 2.1, it states that:

*“In the past, negotiations between fixed and mobile operators typically evolved differently because mobile operators could raise the initially unregulated mobile termination rates without experiencing a reciprocal increase in the often tightly regulated fixed termination rate (FTR). This raised allocative-efficiency concerns where **there is an implicit cross-subsidy from fixed network operators and their customers to mobile operators and mobile customers.**” (emphasis added)*

Likewise, according to section 4.1 of the memorandum accompanying the Draft Recommendation:

*“The main advantage of low interconnection charges based on an incremental-cost approach which **allocates only efficiently incurred costs is that it promotes efficient production and consumption and minimises potential***

competitive distortions. *It sends correct signals to originating operators as to the costs generated by their activities and they can therefore adjust their behaviour in the most efficient manner.*

For example, allowing network costs to be recovered from the wholesale termination rate which do not result directly from the provision of that service can lead to distorted signals and higher prices for the originating operators and, consequently, their consumers. In effect, this results in them cross-subsidising the investment costs of other operators' networks and may also result in a sub-optimal number of calls being made. Currently, there are net transfers of wholesale termination revenues from:

- *fixed network operators to mobile network operators, creating an effective **crosssubsidy between fixed and mobile markets and consumers**; and*
- *net senders to net receivers of voice traffic, which can reinforce network effects and increase barriers to smaller operators expanding within markets.*

Furthermore, this can promote inefficiency on the part of the terminating operator.” (emphasis added)

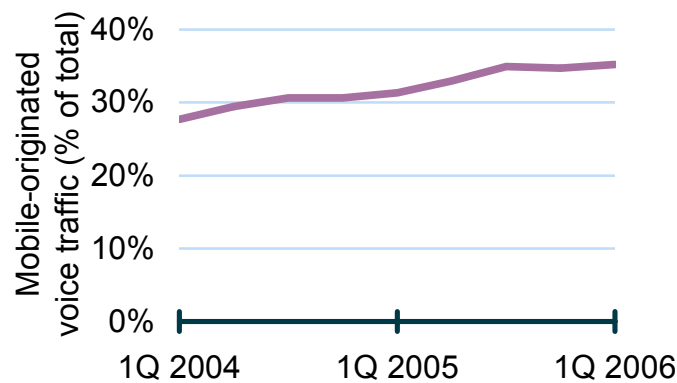
In connection with the above statements, ONO misses a more developed analysis of the negative impact of the fixed-mobile cross-subsidy referred to by the Commission over competition. In particular, we expect that the distorting effect of the subsidy will be particularly acute in an environment of increasing fixed-mobile substitution and emerging convergent F-M services.

F-M asymmetry under increased fixed-mobile substitution

*In effect, as stated in the study *Fixed-Mobile substitution in Western Europe: causes and effects*, by Analysys Research Ltd, “mobile voice services become increasingly affordable, and users opt for the convenience and personalisation of mobile phones, mobile voice services are progressively substituting for fixed voice services across Western Europe. Between the first quarter of 2004 and the first quarter of 2006, the proportion of households with a mobile phone but no fixed line grew from 9% to 12%,*

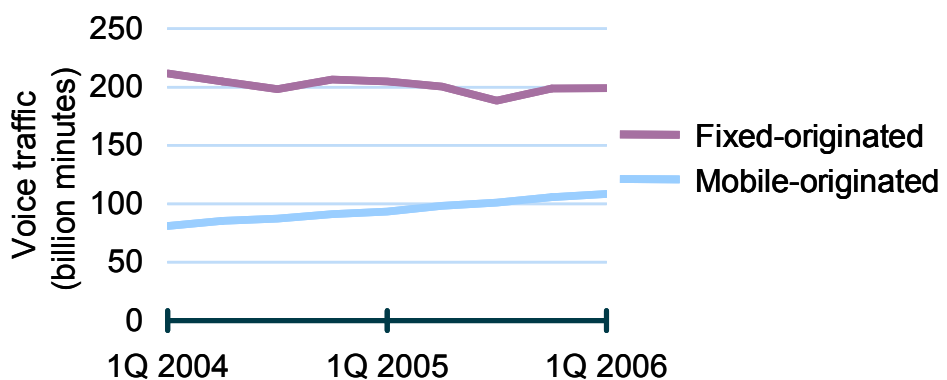
while the proportion of voice minutes that originated on mobile networks increased from 28% to 35%”, as it is shown in figures 1 and 2.

Figure 1: Proportion of households in Western Europe that were mobile-only, December 2003–December 2005.



Source: Analysys Research, 2007

Figure 2: Volume of fixed-originated and mobile-originated voice traffic in Western Europe, 1Q 2004–1Q 2006



Source: Analysys Research, 2007

Against this background of increasing fixed-mobile substitution we note that fixed and mobile networks are not being treated equivalently. Whereas fixed networks have been subject to tight cost orientation principles, mobile networks have traditionally been allowed to apply considerable mark-up over costs. In addition, the regulatory treatment

of mobile termination costs by most NRAs has been such that, as a result of the methodology used and by contrast with the fixed case, a greater portion of the cost of the entire network is attributed to termination.

As shown above, competition of mobile services in the same retail market as fixed services (calls made at home and in the office) is leading to fixed-mobile substitution of both calls and lines. In circumstances where the players are indeed competing in the same retail market, then a party who obtains a higher termination rate gains a network externality which can cause competition harm (ultimately, the weak give to the strong). In this sense the British regulator, Ofcom, has stated in their fixed termination market review that:

“Not only does the terminating provider increase its call termination revenues but it also increases its competitors’ end-to-end retail costs, as the terminating provider’s competitors have to buy its call termination service. The effect of this is that a provider with higher call termination prices has a competitive advantage at the retail level over its direct competitors. This perverse cost incentive is known as the ‘termination externality.’”

In fact, this is a major reason why regulators have historically preferred symmetry (or small and time-limited asymmetries) in termination rates amongst fixed operators. Following the same logic, the principle might be extended to fixed-mobile asymmetry.

We note that this principle, if adopted, might mean that termination rates should be set at below LRIC for the higher cost (i.e. mobile) networks (i.e. it would not be consistent with a position seeking full cost recovery).

F-M asymmetry and the emergence of convergent F-M services

This regulatory asymmetry of fixed and mobile termination rates, if not corrected, has also the potential to hinder the emergence and expansion of converging services by limiting the potential of fixed operators to compete in this market.

Fixed-mobile convergence is a relatively recent development in the telecommunications sector. It involves services that combine the advantages of mobility with the higher capacity and better retail prices of fixed service. For example:



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- Services that direct calls from a mobile phone to a fixed line (e.g., via WiFi) as it is already happening in France and the UK.
- Devices that send instructions from subscribers to their mobile operator via the Internet. Upon receiving the instructions, the mobile operator directs calls to the subscriber over a fixed line (to a telephone number on a fixed network).

It is likely that many more convergent services will be developed in the near future (e.g. a service enabling subscribers to use a mobile phone to direct the downloading of a file to their broadband access line).

ONO's experience introducing these services in the market (with its converging service ONO lo) is that the competitiveness of a fixed operator vis a vis a mobile operator to succeed in this market depends on at least two factors: 1.) the availability of converging handsets provided by manufacturers to fixed operators (i.e. UMA terminals as compared with femtocells used by mobile operators and which allow them to use standard mobile handsets); and 2.) the fixed-mobile interconnection regime. With regard to this last factor, it is our experience that high asymmetric F-M termination rates places fixed operators' converging services at competitive disadvantage. Consequently, we believe that an efficient and competitive converging market should be moving towards a single (converging) termination rate.

Regulatory options to reduce F-M asymmetry

There are a variety of ways in which a lower mobile termination charge, close to that regulated for fixed termination, could be calculated:

1. Bill and keep (i.e. a rate of zero) applied not only to M-M but also to F-M termination.
2. Seek symmetry between fixed geographical and mobile rates as a matter of principle (this is the US position).
3. Change the mobile costing methodology (e.g. by excluding common costs and non-traffic related costs from mobile termination).
4. Simply apply the current costing methodology at face value to eliminate over-recovery.

Selecting the options of “bill and keep” or “symmetry with fixed rates as a matter of principles” would have a number of additional benefits, in particular reducing the cost of regulation of mobile termination rates.

However, although the Draft Recommendation might be tacitly referring to options 1 and 2 above in recital (18), it clearly focuses in option 3 as a way to reach lower mobile termination rates that are closer to those applied to fixed networks.

In ONO’s opinion the Draft Recommendation should explicitly refer to the competition problem created by asymmetric fixed-mobile rates and also includes the reduction of such asymmetry as a policy that NRAs should pursue by the adoption of alternative tools consistent with a competitive market, among which the changes proposed in the costing methodology by the Commission in the Draft Recommendation is but one instance.

III. The economics of termination price regulation

In this section we put forward the economic principles, and their precise interpretation and modelling application which in ONO’s opinion should underlie the Commission’s Recommendation.

III.1. Marginal cost as prime costing principle

Section 4.1 of the memorandum accompanying the Draft Recommendation states that:

*“When deciding on the correct level of the regulated wholesale termination rate, it is essential to ensure that the methodology adopted promotes efficient production and consumption decisions, and minimises any artificial transfers and distortions between competitors and consumers. Therefore, **regulators should construct models which set wholesale termination charges as close to marginal cost as possible.** The closer the termination price of all operators is to the marginal cost, the more likely it is that this will lead to the most efficient and least distortionary use of call termination services, and minimise the risk of problems such as cross-subsidisation between operators and customers and inefficient pricing and investment behaviour. Therefore, it is*

justified to apply a pure LRIC approach where the relevant increment is the wholesale call termination service and which includes only those costs that would not be incurred if that service were no longer produced (i.e. avoidable costs).” (emphasis added)

ONO fully agrees with this view.

Under standard economic assumptions –for a purely competitive economy– economic efficiency (technical and allocative) is maximized when all services are priced at marginal cost. This means that if termination prices are set at the marginal cost of producing that service then allocative efficiency is automatically ensured.

Traditionally, regulators in the telecom sector has avoided setting prices according to marginal costs since that would not allow operators to recover common and joint costs, which are pervasive in the telecom sectors. In effect, in the telecom sector the same network elements are typically shared by different services and a marginal cost approach applied to every single service would prevent even efficient operators from covering their total costs.

The regulatory pricing problem is therefore to maximize economic efficiency subject to the constraint that the regulated firm covers its total costs (including its cost of capital).

According to basic Ramsey pricing theory the answer is to set percentage mark-ups for all services inversely proportional to the elasticities of demand. That is, percentage mark-ups are highest for the least elastic services and lowest for the most elastic services.

However, regulators have also been reluctant to apply Ramsey mark-ups to regulated telecommunication services (interconnection, access to the local loop, termination, etc.) for a number of reasons ranging from the political reluctance to adopt what essentially is a discriminatory pricing policy to practical reasons associated with the difficulties to calculate demand elasticities for regulated services. Instead, they have typically applied ad-hoc mark-ups, such as equi-proportionate mark-ups (EPMU), to LRIC or fully attributed costs estimated for individual services in order to recover joint and common costs.

By contrast with this approach, the Commission, in the draft Recommendation, adopts an economic approach to wholesale termination pricing that while going back to the first-best policy of setting prices equal to marginal costs, does not rely either in a pure

Ramsey model nor in the traditional EPMU approach for the distribution of joint and common costs among services, but instead takes into account the possibility of recovering non-incremental costs from other services – regulated and unregulated.

Some may argue that precisely it is these non-regulated and, allegedly, competitive services that are likely to show higher demand elasticity and, thence, the Commission would be acting against Ramsey pricing and Economic Theory. In ONO's opinion this view however is wrong and the Commission's approach is correct.

There are at least four factors that mitigate against the use of Ramsey pricing in setting termination rates: 1) the use of retail quantity discounts; 2.) the negative impact of high MTR over fixed networks; 3.) the increased risk of regulatory failure; and 4) the political-economic consequences of shifting wealth among groups of operators and consumers on the basis of imprecise estimates of demand elasticities by regulators.

Quantity discounts

In its standard form, Ramsey pricing is based on a model of linear pricing, where quantity discounts are not offered and common costs are recovered by introducing mark-ups over the marginal costs of different services. Its theoretical benefits apply in this context².

Contrary to that model, the telecoms industry has an elaborate structure of quantity discounts. Contract subscribers pay lower per-minute charges than do prepaid subscribers. Big-bucket customers pay the lowest usage charges of all. Whereas it is true that this kind of non-uniform pricing is particularly developed in the U.S., for example, nevertheless European operators typically offer a range of plans that have different levels of fixed monthly charges (which generally includes some amount of free usage) and different usage charges (for usage above the free amount). These plans allow operators, even in the absence of regulatory intervention, to price many services closer to marginal cost, while still recovering fixed costs through fixed monthly charges from contract customers.

² Although the basic Ramsey model can be generalized to nonlinear pricing as well, it would pose considerable complexity in the case of mobile telecommunications given the complex non-linear pricing policies applied by operators. In these circumstances, the recovery of common costs as suggested by the Commission may well be more reasonable than the use of Ramsey pricing to approximate the actual non-uniform pricing structure.

Under these circumstances, the Draft Recommendation proposal not to allow recovery of common costs in termination rates is perfectly efficient: termination prices are optimally set closer to the marginal cost of the service while mobile operators can recover common costs from mobile contract subscribers through non-uniform pricing with no efficiency loss.

In addition, it is possible that optimal non-linear pricing also improves economic efficiency in the industry compared to optimal linear pricing (Ramsey prices) by reducing the spill-over effect of high termination rates on fixed networks, as we will explain in the next subsection³.

Impact of high MTR over fixed networks

One effect that it is not taken into account by a basic Ramsey Pricing approach applied to mobile termination pricing is that a high mobile termination rate may distort competition by the effect produced in the closely related fixed voice market.

A calling party network pays (CPNP) wholesale termination regime allows a mobile operator to levy charges on other market players (interconnecting operators) and their customers, who are normally to some extent detached from the pricing decisions of the operator providing the termination service. Thus there is little incentive for the operator selling the termination service to compete and offer better prices on that part of the business. Any productivity gains achieved by the operator will only flow through to termination prices paid by interconnecting operators according to the rate at which the regulator can maintain up-to-date price controls. In a rapidly developing market (e.g. 3G mobile, NGN deployment) there is the potential for regulated price controls to become years out of date. As such, an approach to termination prices based on getting those prices closer to marginal costs and increasing the proportion of each operator's business which prices are constrained by market forces instead of regulatory mechanisms, does not only allow for the efficient recovery of common costs under a non-linear pricing scenario (see above) but also increases the incentives for operators

³ For a full discussion of the potential benefits of quantity discounts and other non-uniform pricing structures, see S. J. Brown and D. S. Sibley, *The Theory of Public Utility Pricing*, Cambridge University Press, 1986.

to improve their productivity and efficiency and reduces the negative spill-over effects of high mobile termination pricing on fixed telecommunications.

Increased risk of regulatory failure

The recovery of common costs through non regulated services also reduces the burden of regulation that must define a material component of cost recovery through inter-operator charges. Likewise it reduces the risk of regulatory failure and market distortion.

This, in turn, increases legal certainty. That is to say, with the EC's proposal a mobile operator would recover a larger portion of its revenues on the basis of providing more value to subscribers than do its competitors. It would recover a smaller portion of its revenues on the basis of a parameter set by regulatory calculation that can be subject to errors resulting from the lack of complex information (statistical estimates of demand elasticities for services are typically quite imprecise) and also from the impossibility for regulators to catch up with rapid technological/market development. In addition, this calculation might produce results which are unharmonized across different NRAs and also (as we see below) subject to external influence exerted on the regulatory process.

Furthermore, the greater the proportion of costs which are recovered through regulated prices (or, more acutely, a single regulated charge) then the larger the procedural, resourcing and time requirements that all parties will necessarily have to contribute to a burdensome regulatory and resolution process. Additionally, regulatory intervention inevitably distorts market incentives to a significant extent.

Because industries function better when unnecessary regulation is removed, reducing the scope of regulation without compromising the regulatory goals, as the Draft Recommendation does, can be expected to lead to an increase in efficiency (that is not taken account of in the Ramsey formula).

Increased risk of regulatory capture

Closely related to the above is the fact that if Ramsey pricing is used, considerable wealth can be transferred between fixed operators/subscribers and mobile operators/subscribers on the basis of very subjective regulatory judgements.

Nevertheless, a great deal of money changes hands on the basis of subjective regulatory judgements regarding these estimates.

Subjective regulatory judgements inevitably lead to rent-seeking behaviour on the part of industry participants – both suppliers and customers. Some such participants can usually exert significant political influence. Such behaviour can have destructive consequences for the entire regulatory process. Many regulators try to ameliorate this problem by relying as much as possible on simple rules, rather than subjective judgements. The rules may diverge significantly from optimality, but they avoid the adverse political-economic consequences. The EC's proposal is therefore advantageous in this respect.

An additional benefit of the Commission approach is that it allows to internalize the “call externality” without suppressing the calling party pays principle.

In the memorandum accompanying the Draft Recommendation, the nature of this “call externality” is explained as the externality created by not recovering part of the termination cost of an incoming call from the receiving party:

*“Under RPP [**receiving party pays**] the receiving network terminates calls without charging the originating operator the full cost of that termination service, leading the operator to potentially recover part of the termination costs from their own retail customers.*

*Since this charge is now noticeable to the consumer, there is an incentive for the consumer to respond to that charge where more competitive alternatives exist. Thus, both incoming and outgoing call charges are subject to competition. Such a settlement system is consistent with an argument that while the calling party causes a cost originating the call, the called party causes a cost by accepting it and thus it recognises the existence of a **positive call externality to the receiving party.**” (emphasis added).*

However, in recital (14) the Draft Recommendation the Commission, while recognizing the existence of a “call externality” under the current CPP system, disregards replacing CPP for a RPP principle:

“In any case, it may be noted that call termination is a service which generates benefits to both calling and called parties (if the receiver did not receive a benefit it would not accept the call), which in turn suggests that both parties

*have a part in the creation of costs. The use of cost causation principles to set cost-orientated prices would suggest that the creator of the costs should bear those costs. **Recognising the two-sided nature of call termination markets with costs being driven by two sides, not all related costs need to be recovered via the regulated wholesale termination charge.** However, for the purposes of this Recommendation, it is proposed that the avoidable costs of providing the wholesale call termination service can be recovered via the wholesale charge.” (emphasis added).*

In ONO’s opinion, given that under cost causation both the calling and the receiving parties should contribute to terminating cost it is neither necessary nor justified to replace the CPP system by a RPP system but only to adopt a regulatory pricing policy that is flexible enough to ensure that both parties contribute to cost. In that sense, although the Draft Recommendation proposes to allocate the full marginal cost of terminating call to only one of the two sides of the market (the calling party), by stating that common costs are to be recovered from other non-regulated services, gives incentives to receiving networks to allocate some costs to receiving customers according to demand elasticities (that is to say, according to its customer willingness to pay for receiving calls) and competition conditions. This, in consequence, induces the internalization of call externalities not by introducing a RPP or regulating a second price (receiving calls) but by leaving operators to freely allocate some costs to receiving parties according to market conditions.

As a summary of all the above, in ONO’s opinion economic efficiency can be achieved when termination services are priced close to marginal costs as stated by the Draft Recommendation because while applying a first-best pricing principle to a regulated service, this policy allows the regulated operator to recover the common costs in a way that minimizes distortions and detrimental social effects of call externalities if there are high termination prices.

III.2. Likely impact

The Draft Recommendation’s proposal to recovery common and joint costs that are currently being partially allocated to terminating calls might be expected to have a positive influence on retail prices for mobile calls, particularly those originated in fixed

networks, and overall usage pattern and resource allocation in the telecommunications sector as a result of the internalization of call externalities and reduction of F-M subsidies. It would also have a positive impact resulting from reducing the incentives to use on-net/off-net differentiation to raise barriers to entry.

To this view some may oppose that the costing principles introduced by the Draft Recommendation will also have a negative impact over the prices of other services that will now have to support an increased share of joint and common costs. In particular, it may be hypothesized that mobile operators could tend to apply the following three mechanisms to cover common costs under the new rules set in the Draft Recommendation:

- Introduction of an incoming call fee to be charged by a mobile operator to its customers;
- Introduction (or extension where it already exists) of a mobile line subscription fee;
- Increased per minute prices applied to originating calls.

Allegedly, these pricing strategies will have, in turn, negative distributional effects over usage rates and consumer welfare. For example, it might be alleged that if mobile operators introduce an incoming call fee, low-use mobile subscribers (those who mainly receive calls) will be worse off and usage rates will decrease.

However, in ONO's view this would be a partial impact analysis as it is necessary to take into account the following:

- Retail competition makes it unlikely that mobile operator can recover a larger proportion of common costs through retail call prices. It is true that the elasticities for retail mobile services have generally been found to be inelastic, but it is also true that the current level of retail prices already take into account such inelasticity. Therefore, the question is whether a reduction in MTRs increase or not the likelihood of a non competitive cooperative retail price increase. In this sense the Economic literature suggests that it is high termination rates and not the opposite that contribute to tacit cooperation among mobile operators to keep retail prices high.



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- Lower wholesale termination rates will bring about a reduction of fixed-mobile call prices and facilitate the reduction of mobile-mobile originated call prices. Lower termination rates will also reduce fixed to mobile subsidy and facilitate efficient convergence of fixed and mobile services. Efficient consumption would cause an expansion of traffic. Given the fixed nature of most costs in the telecommunications sector, this traffic expansion will result in reduced per unit costs of most services.
- Even if line subscription or receiving call fees are introduced, competition will give mobile operators incentives to minimize the impact of the new cost allocation rules by creating packages that includes subscription fee, flat rates for incoming and outgoing calls, etc. Additionally, mobile operators almost always offer an elaborate schedule of quantity discounts. Such discounts allow the operators to recover substantial revenue from large contract customers, while keeping the marginal price of minutes of use to such customers low. Such pricing limits the repression of usage. Indeed, the marginal price for large customers is often zero.
- From the point of view of consumer welfare, it is the aggregated welfare of fixed and mobile consumers that matters. This means that on average most consumers will likely see simultaneous reductions of outgoing fixed-mobile and potentially other calls, along with any would-be new subscription fee or incoming call fee. Consumers will then be able to choose the most efficient network to subscribe to, and make calls from: fixed, mobile or both. This lack of distortion in the market for subscription and calling should result in an increased social benefit. Therefore, if the proposed measures bring about an overall reduction of the bill paid by fixed/mobile consumers then they are suitable from the standpoint of a social cost-benefit analysis
- The question is not whether the introduction of -for example- an incoming call fee reduces mobile usage but rather if it induces the efficient level of consumption of telecommunications services by customers. Even if some customers are worse off, in the aggregate the measures would still promote efficient consumption and increase overall consumer welfare, as stated in the previous point.

- A reduction of termination rates as a result of the proposed measures will bring about a reduction of fixed-mobile asymmetries and, consequently, of distortions in fixed-mobile competition. More symmetric F-M termination rates should also ease the conclusions of interconnections agreements in a converging fixed-mobile market with the positive outcome of new converging services for customers.

IV. Practical implications for LRIC modelling

As we pointed out in section II of this submission, regulators can adopt different regulatory tools to bring mobile termination rates to a level closer or equal to that of fixed termination rates. If regulators choose to apply an incremental costing approach to mobile termination rates along the principles contained in the Draft Recommendation, ONO considers that: 1.) it is important to define a LRIC increment as close as possible to the marginal cost of termination rates; and 2.) the Draft Recommendation should be expanded to unambiguously define the LRIC modelling principles to be applied by NRAs, because, as it stands, leaves room for interpretation and does not robustly justify an accurate modelling approach. Each of these two issues will be developed in the following subsections.

IV.1. Definition of the increment in the LRIC model

In practical terms, that is to say, in terms of cost modelling, an efficient mobile termination rate close to the marginal cost of the service is achieved by calculating the long run avoidable cost associated with termination. That is to say, the efficient termination price (per minute) should equal the average-per-minute avoidable cost of providing the service with the best technology and operating at efficient scale. It will be shown below that this long run average cost is, by definition, equal to the long run marginal cost of providing the service.

In a Long Run Incremental Cost (LRIC) model the so called “increment” admits a number of definitions:

- the marginal unit of demand for a service

- the total demand for a service
- the total demand for a group of services
- the total demand for all services in aggregate.

It would be impractical to utilise the increment definition marginal unit of demand for wholesale termination – for example, the cost of the marginal unit of demand (a minute) varies widely and unpredictably according to where in the network and when during the day that the minute is carried. Such pricing signals would be intractable and incomprehensible.

On more economic grounds, such cost increment would not be suitable as regulatory pricing principle as it cannot be associated to the long term marginal cost but to the short term marginal cost and therefore would not generate the right market signals for investment in long term optimal capacity and network design.

A definition of the increment consistent with the Draft Recommendation's first-best principle of pricing at marginal costs is that resulting from using the total demand for wholesale termination. The long run incremental cost resulting from this increment might be expected to be close to the long term marginal cost, that is to say the minimum cost increase incurred by an operator when traffic is expanded beyond the long term optimal network dimension or, alternatively, the maximum cost saving obtained when traffic decreases with respect to that optimal dimension.

In effect, the long run incremental cost (LRIC cost) for an individual service as obtained from a LRIC model is an average long run cost for a network dimension which is close to optimal. As microeconomic theory states, the long run marginal cost and the long run average cost curves intersect each other at the point of optimal network dimension/minimum long run average cost. Consequently, at near optimal dimension, the termination cost resulting from a LRIC model (an average cost) approaches the long run marginal cost of providing the service, which is the first-best economic pricing standard pursued by the Commission.

A broader definition for the increment, in which a number of services are grouped together (e.g. total traffic, total voice), would introduce joint and common costs into the regulatory pricing problem. As explained above, efficiency will be increased when these costs are increasingly recovered from competitive, non-regulated services.

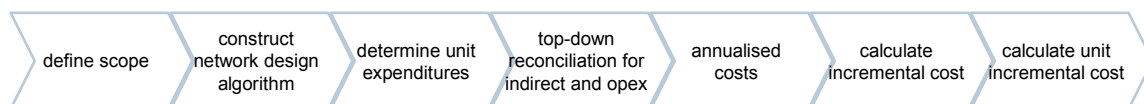
IV.2. The LRIC modelling

Consistent with established practice, the Draft Recommendation has stated that an incremental costing approach should be followed. ONO supports this approach. However as it stands, the Draft Recommendation leaves room for interpretation and does not robustly justify a precise modelling approach. ONO submits that the Draft Recommendation should be expanded to unambiguously define the modelling principles.

Calculating the incremental cost of wholesale termination

The LRIC modelling exercise defined by the Draft Recommendation requires the following steps to be taken:

1. define scope of model (scale, services, network elements)
2. construct bottom-up network design algorithm for each network element
3. determine modern, current, expenditures associated with each network element
4. undertake top-down reconciliation to identify missing indirect, overhead or operating expenditures not covered by the previous step
5. apply an expenditure annualisation method to determine annualised cost, including cost of capital employed
6. determine the incremental costs of wholesale termination by running the model with the total volume of wholesale termination traffic set to zero
7. divide the incremental cost by the terminated volume to specify the per-minute wholesale termination rate.



Define scope of model

The initial stage of constructing a LRIC model specifies the extent of the calculation.

The scale of business to be modelled in terms of market share is crucial for the overall cost result due to economies of scale which

must be captured in the calculation. ONO submits that the EC Draft Recommendation Annex could be improved in this regard: the EC reasonably states "the recommended approach is to set scale as follows: $1/\text{Number of Mobile Infrastructure Operators}$ " for mobile costing, but leaves room for interpretation in defining efficient fixed operator scale. We submit an improvement to this below.

The full range of services modelled should be included in the cost calculation, according to the Draft Recommendation Annex. ONO agrees with this specification. It is important that competitive services are not left out of the model since the economic principles of the model require that joint and common costs are recovered from these competitive services. However, it is also necessary to ensure that emerging services are also included in the model since certain new infrastructure deployments are specifically undertaken to support non-voice services. For example the costs of HSDPA upgrades to 3G radio networks should not be allocated to termination but to the new services supported by such upgrades.

The number and detail of network elements modelled must be consistent with the aim of identifying the wholesale termination incremental costs. This means that whilst data service infrastructure should be included (e.g. to make the process of reconciliation against top-down accounts more directly comparable), it is not required in great detail as it will not be sensitive to the wholesale termination increment. On the other hand, network elements which are sensitive to voice traffic volumes (e.g. transmission, transceivers, inter-switch ports) will need to be modelled in sufficient detail to reflect the deployment of these items with respect to volumes since it is these types of network elements which will form the majority of the LRIC of wholesale termination.

*Construct
network design
algorithm*

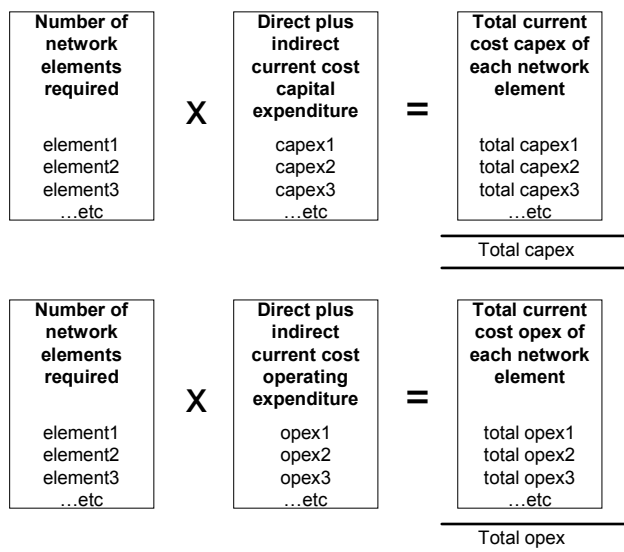
The core of a bottom-up cost model is the network design algorithm, which takes demand and cost driver inputs and calculates a resulting network deployment. This part of the model must reflect the topology

of the network. For example: extent of deployment (coverage), types of transmission architecture, erlang versus minute versus connection sensitive elements and associated indirect network activities. The network design should be modern and efficient, specifically representing the best available technologies such as 3G and NGN facilities. We provide more discussion on modern technology later in this section.

Determine unit expenditures

Capital and operating expenditures are spent by the network operator.

The number of network elements modelled must therefore be multiplied by a per-unit expenditure, covering relevant direct and indirect items:



ONO supports the recommendation of applying current costs as reflecting the competitive basis on which wholesale termination costs should be modelled. The Draft Recommendation correctly states that historic costs are not relevant to long-run wholesale termination regulation: ONO agrees that they must be translated into current cost figures to be relevant (for example, as a measure of GRC –Gross Replacement Cost– the total amount it would cost to replace an asset at current prices.).

*Top-down
reconciliation*

The application of top-down reconciliation to a bottom-up model is a valid activity to improve the robustness of the bottom-up result. ONO supports the EC Draft in this recommendation. Of particular relevance in the view of ONO is the shortcoming of indirect and operating expenditure capture in bottom-up models. Whereas it is recognised that capital equipment expenditures are in practice related to the quantity and capacity of network items installed, there is a much weaker relationship for indirect and operating expenditures. Also, since indirect and operating expenditures are often incurred in *fixed* quantities they will be, to a greater extent than direct network equipment expenditures, non-traffic-sensitive costs. ONO submits that the EC enhance the stated purpose of top-down reconciliation to ensure, primarily, that efficient costs are reflected and fixed non-traffic-sensitive costs can be identified and excluded from the LRIC of wholesale termination.

Annualised costs

The expenditure requirements of the network (capital expenditures or GRC, operating expenditures) must be annualised in some form. Whilst economic depreciation is recommended by the EC, correctly in the view of ONO, the interpretation of a suitable proxy is left open to interpretation. Further discussion on depreciation methods is provided below, along with ONO's suggestions to the Draft Recommendation.

*Calculate
incremental cost*

The modelling activity of calculating the incremental cost of wholesale termination should be a simple task. The model is run with, and without the demand for wholesale termination. All aspects of the long-run cost model encoded into the network design and expenditure algorithms should function to determine the avoidable costs. In this application, the model result is the aggregate annualised cost (in the year) of the wholesale termination increment.

*Incremental unit
cost*

The activity of calculating a unit cost is similarly straightforward: the aggregate annualised cost (in the year) is divided by the volume of

traffic (in the year). If call set-up versus conveyance charges are to be determined, then the aggregate annualised cost should be divided into two components – normally by specifying for each network element cost within the incremental cost whether it is connection or conveyance sensitive, or by examining the cost model algorithm to determine the division.

In the LRIC modelling process, the EC Draft Recommendation has already introduced a number of relevant issues:

- exclusion of the coverage network from the incremental cost
- definition of the coverage network
- top-down reconciliation where necessary to improve robustness
- economic depreciation
- efficient scale
- efficient, modern technology

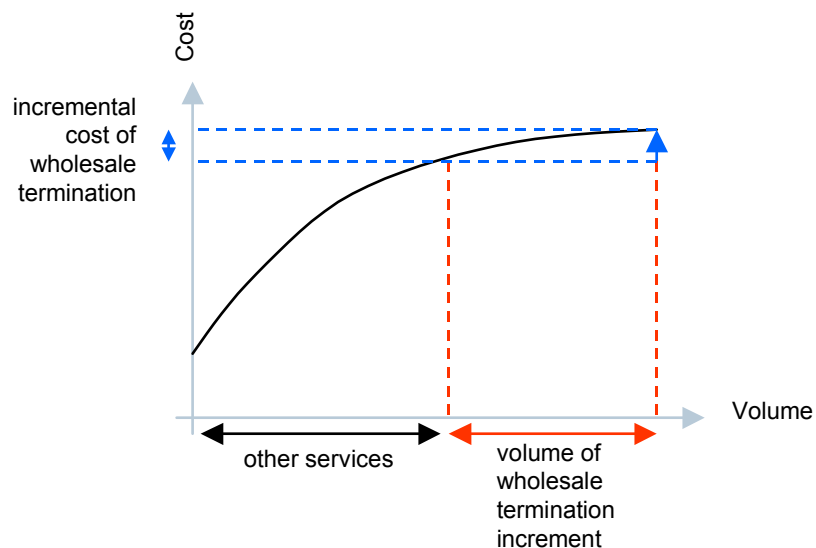
ONO's submission on these aspects is provided below.

Exclusion of the coverage network from the incremental cost

The exclusion of the coverage network from the incremental cost is an intrinsic and unavoidable outcome of the application of the increment *total demand for wholesale termination*. The clear principle of incremental costing means that, **by definition**, costs which are incurred in the deployment of coverage cannot be sensitive to the volume of traffic which the coverage network subsequently carries. Non-traffic sensitive costs such as business overheads (supporting various network services and/or retail services in addition) also fall unambiguously into this exclusion. The EC should ensure that its final recommendation is clear in this respect by virtue of robustly applying the justified and efficient increment definition; it is not an optional or additional criteria but one which is fundamental and immovable from the incremental costing principle of a single service.

For example, Recommendation (5) should be made explicit stating “A distinction needs to be made between traffic-sensitive costs and non-traffic-sensitive costs, since the latter costs do not form part of the incremental cost of wholesale termination”, the same text appears in the Annex on both fixed and mobile calculation principles.

The application of the increment is shown below.



As explained clearly in the Draft Recommendation, the wholesale termination increment is applied as the last (marginal) service in the business to determine the incremental – *avoidable* – costs of wholesale termination. Therefore, the network design algorithm must be able to accurately capture the cost-function of the operator between **the total volume** and the **total volume less wholesale termination**. In order to obtain meaningful results, the modeller must focus attention in this area.

Business overheads which are a business common cost, and network common costs (e.g. network management) will clearly be incurred at zero volume (as in the chart above) and therefore automatically fall outside of the avoidable costs of the wholesale termination increment.

Finally ONO suggests that the EC explicitly states a requirement for complete consistency in the application of the increment in fixed and mobile cost models.

Correct definition of a mobile coverage network

The text of the Annex to the Draft Recommendation sets out what is to be understood by “coverage” in the following terms:

*“Coverage **can be best described** as the capability or option to make a single call from any point in the network at a point in time, and capacity represents the additional network costs which are necessary to carry increasing levels of traffic.” (emphasis added)*

ONO agrees with this description. It logically suggests that **any** items of network equipment which, by their removal, reduce the capability or option to make a single call from **any** point in the network (i.e. reduces coverage) cannot be included in capacity. ONO therefore suggests that the EC make of its “description” of capacity a explicit **definition** of such concept by rewording this part of the Annex to the Draft Recommendation as:

*“Coverage **is defined** as the capability or option to make single call from any point in the network at a point in time, and capacity represents the additional network costs which are necessary to carry increasing levels of traffic.”*

The text of the Annex states further:

“The need to provide certain minimum coverage requirements to subscribers will cause non-traffic related costs to be incurred”

ONO finds that this statement is unnecessary and causes confusion by introducing a new concept -“minimum coverage”- that contradicts the EC’s initial definition of coverage. The implication of “minimum coverage” is that mobile operators would only increase their coverage beyond the “minimum” in response to traffic levels. ONO however does not find this implication to be satisfactory or likely. There is evidence that a mobile operator will increase its coverage in the absence of traffic when it believes that this will enhance its competitive position.

ONO also suggests that the definition of mobile coverage is further explained in the recommendation to be **the total availability of national public mobile network signal across outdoor and in-building areas.**

The mobile coverage network should also be required to be a functioning network – i.e. capable of actually carrying one minute of traffic, of any particular type of traffic. As such, the coverage network can be defined to include the necessary minimum backhaul transmission, switching architecture, inter-switch transmission, ports and supplementary network management systems to enable the national radio network to function as a network. Any definition of coverage which is not a functioning network would not be capable of properly carrying a minute of traffic and thus would be inconsistent with the EC's definition of coverage.

The same coverage definition should be applied in the fixed network model, albeit with a different access technology. It is likely therefore that the main switching nodes (MSC, tandem exchanges) in the fixed and mobile coverage networks and their inter-switch transmission topology are reasonably similar – geographically they are likely to be placed in the same population centres and use the same national transmission routes in order to support a minute of traffic. ONO suggest that the EC Recommendation makes this consistent treatment of fixed and mobile coverage explicit.

As explained in the section on economic principles, the costs of this coverage network, along with other traffic-sensitive costs of retail services could be recovered from a mixture of subscriber line rental and voice/data per minute or flat charges. The same principle should apply to fixed networks although in this case, existing member state retail regulation regarding line rental has given rise to a particular structure of retail pricing and therefore cost recovery – though this retail regulation may or may not be lifted as part of member state regulatory actions.

Specifying all network availability as coverage is especially important in the context of fixed-mobile convergence. Indoor coverage explicitly competes against fixed origination services and as such is clearly a cost of the competitive mobile subscriber access and origination services, rather than incremental to wholesale termination services purchased by third parties. These third parties who must pay the wholesale termination rate are often competing to provide an alternative access and origination service in the same areas – by whatever existing or emerging technology – and therefore the choice

of access technology should be indistinguishable by setting of technology independent regulation.

The approach defined precisely in this section is also consistent for example with the EC's correct treatment of additional spectrum to increase capacity. Furthermore, in this regard we recommend that the EC expands the definition of additional spectrum, again to be correct and consistent with the incremental costing approach, such that the costs associated with extra coverage achieved from additional spectrum (e.g. by virtue of operating at a lower frequency band) is not taken to be incremental to wholesale termination traffic.

Top-down reconciliation to improve robustness

ONO supports the EC's recommendation of the opportunity to refer to top-down information to improve a bottom-up cost model. In this recommendation, the reference to audited information is important – an audited set of accounts provides the best certainty against possible inaccuracies in cost treatment or allocation.

It is important that when referring to top-down data that the level of efficiency can be identified e.g. by comparing with international or national benchmarks of similar operators' deployments or expenditures. This is to ensure that inefficient expenditures do not cross over into the bottom-up model. An audited set of accounts does not necessarily imply efficiency – at least only accordance with accounting rules.

The purpose of including reference to top-down information is to improve possible shortcomings of the bottom-up model. The most significant of these possible shortcomings are likely to be related to the overall level of (efficient) expenditures calculated by the bottom-up model. In this area, it will be important that reference to top-down information aims to accurately identify indirect and operating expenditures which are not explicitly captured by network elements in the bottom-up model. Top-down cost information may also reveal the extent to which discounts in supply contracts give rise to materially lower expenditures that predicted purely by standard equipment prices lists. In examining top-down information it will be important, from the point of view of costing the wholesale termination increment, that joint and common indirect and operating expenditures can properly be identified in the top-down data. Such a distinction is less important when performing *total traffic increment plus mark-*

up costing as all costs are averaged into the unit cost of network services; however when calculating the incremental cost of wholesale termination in isolation, it is crucial to understand the cost function of indirect and operating expenditures. ONO suggest that the recommendation of applying top-down information is enhanced to recognise the importance of (in)efficiency, fixed versus variable indirect and operating expenditures, and quantifying the magnitude of equipment contract discounts.

Economic depreciation

The model for network services will produce a schedule of capital and operating expenditures, or asset gross replacement cost. These expenditures must be recovered over time, ensuring the operator can also earn a return on investment. There are four main potential depreciation methods:

- historical cost accounting (HCA) depreciation
- current cost accounting (CCA) depreciation
- tilted annuities
- economic depreciation.

Economic depreciation is the recommended approach for regulatory costing. The table below shows that only economic depreciation considers all potentially relevant depreciation factors:

	<i>HCA</i>	<i>CCA</i>	<i>Tilted annuity</i>	<i>Economic</i>
MEA (modern equivalent assets) cost today		✓	✓	✓
Forecast MEA cost			✓	✓
Output of network over time				✓
Financial asset lifetime	✓	✓	✓	✓ ⁴
Economic asset lifetime			✓	✓

⁴ Economic depreciation can use financial asset lifetimes, although strictly it should use economic lifetimes (which may be shorter, longer or equal to financial lifetimes).

The primary factor in the choice of depreciation method is whether network output is changing over time. In a fixed network, circuit-switched traffic levels are relatively stable, and so tilted annuities are often chosen as a proxy for economic depreciation. In a mobile network cost model, where demand is more variable over time (e.g. for an actual operator), then results using tilted annuities will differ significantly from economic depreciation. However as fixed and NGN networks evolve with multi-play services, there is a decreasing likelihood of stable network outputs. The difference between HCA and CCA depreciation is the inclusion of MEA prices – which is applied in the calculation as *supplementary depreciation* (the difference between the current value depreciation and the historic value depreciation) and *holding gains/losses* (the increment or decrement of the value of an asset). This difference between HCA and CCA is generally uninteresting in the light of more significant differences between HCA and annuity or economic depreciation. ONO supports the EC position that only economic depreciation or a suitable proxy should be applied.

However, ONO submits that the EC should refine its Recommendation to reduce interpretation. Specifically, two points are relevant:

- Economic depreciation should be preferred to tilted annuity depreciation, the alternative proxy. ONO sees no reason to expand the options to include straight-line CCA depreciation unless information is already available on this basis in audited accounts – and in this case it should still be investigated whether the preferred or alternative methods can be applied.
- ONO submits that fundamental differences in economic depreciation or use of a proxy method are not allowed to emerge between the costing of fixed and mobile termination services. The aim of the Draft Recommendation for increased consistency in this area should be closely examined and maintained with respect to the choice depreciation methods for fixed and mobile expenditures.

Point (16) and Recommendation (6) in the Draft discuss the choice depreciation methods. ONO suggests that the following statement is added to the end of these two paragraphs: “Tilted annuity depreciation should be preferred over historic and current straight-line depreciation methods.”

Proper consistency will also be required in the area of *cost of capital*. The Draft Recommendation is silent on this significant issue, which should be specified in the EC's final decision according to consistent treatment between fixed and mobile systems. Technological neutrality and fixed-mobile convergence require that neither fixed or mobile systems are discriminated in terms of costs of capital employed – the opportunity cost of making investments – that are required to deploy a network and deliver services. As fixed networks move from digital circuit switching into NGN architectures and next-generation access facilities, they are equally as risky as 3G mobile systems built on the back of established and stable GSM networks and services. Asymmetry in terms of cost of capital should explicitly be stated by the EC as only permissible in the context of short-term justifiable risk allowances for new entrants.

Efficient scale

The Draft Recommendation Annex states that:

“To determine the efficient scale for the purposes of the cost model, the recommended approach is to set that scale as follows: 1/Number of Mobile Infrastructure Operators. It may be expected that mobile operators, having entered the market, would strive to maximise efficiency and revenues and thus be in a position to achieve a minimum market share of 1/Number of Mobile Network Operators.”

And accordingly, the EC states in recital (8) of the Draft Recommendation that:

“In order to achieve these objectives, the regulated termination rates should be brought down to the costs of an efficient operator. New entrants should be aware that symmetrical termination rates are applicable to all operators and they should not rely on receiving higher termination rates upon market entry.”

For the purposes of setting cost-based wholesale termination regulation, ONO supports this position and suggests that it should be a fundamental principle of a wholesale termination cost model that it be based upon 1/N scale. Mobile operators have typically been awarded national spectrum licences and have deployed coverage to in excess of 99% of the population. Therefore, they face no insurmountable impediment to achieving 1/N scale – particularly for the 99+% population covered – which should be funded by competing, interconnecting operators through termination charges.

By contrast with the “1/N approach” adopted for mobile networks, the Draft Recommendation leaves room for interpretation of scale in fixed networks. Therefore, in the Annex to the Draft Recommendation, the EC simply set out general guiding principles to be taken into account when defining efficient scale for fixed networks:

“To determine the efficient scale of an operator for the purposes of the cost model, NRAs should take into account that in fixed networks operators have the opportunity to build their networks in particular geographic areas and to focus on high-density routes and/or to rent relevant network inputs from the incumbents.”

ONO however suggests that the same, fundamental principles for determining scale in the case of mobile networks should be applied to fixed networks in order to maintain consistency between fixed and mobile costs and regulatory neutrality.

As the EC points out “alternative operator have the opportunity to build their networks in particular geographic areas”. That means, that consistency with the mobile case requires that within those particular areas where alternative fixed networks have been deployed it is reasonable to expect that they can achieve 1/F market share, where F is the number of fixed access infrastructure providers within that coverage. In these areas, as it is also the case for mobile networks, a number of alternatives network would compete on the basis of same coverage and, as the EC states for mobile networks, *“it may be expected that operators, having entered the market, would strive to maximise efficiency and revenues and thus be in a position to achieve a minimum market share of 1/Number of Operators”*.

Therefore, applying a *consistent coverage versus scale principle* means that it is reasonable to calculate the fixed network cost according to, for example: 50% market share for the population (homes passed) where a cable operator is competing with the fixed incumbent, plus 100% market share for the population where the incumbent holds an access monopoly.

An alternative -though less rigorous approach- would consist of considering that the efficient fixed network operator has a market share of 1/N nationwide, where N is the number of alternative operators deploying their own network over a significant extension of the national territory.

According to the above, ONO submits that an explicit reference to consistently determining fixed and mobile scale should be made in the Recommendation.

Efficient modern equivalent assets/costs

The Draft Recommendation recognises the need to apply modern network equipment and expenditures in the cost calculation. In the current draft however there is some inconsistency and lack of specificity. The draft allows for a combined 2G and 3G access infrastructure “reflecting the anticipated situation”. It is not clear to ONO that a combined 2G/3G network is necessarily efficient or modern. Since the EC places some importance on a secondary market for spectrum, ONO considers it reasonable to assume that the efficient mobile operator being costed is not constrained by the historic allocation of spectrum. As such, a single technology with access to 900MHz frequencies, either 2G-only or more likely in the coming years 3G-only, would be efficient.

In terms of core transmission architectures, ONO supports a consistent application of an efficient definition to both fixed and mobile costing. There is no reason to consider that transmission technology for a modern mobile network would be any different from a modern fixed network because they are both intended to carry a mix of voice and data traffic to similar quality parameters.

V. Conclusions

The Draft Commission’s Recommendation on the regulatory treatment of termination rates constitutes a sound economic and regulatory approach to the problems created by the asymmetric and unharmonized treatment of fixed and mobile termination rates.

The main problems created by the asymmetric regulatory treatment of fixed and mobile termination rates are: 1.) distortions in fixed-mobile competition, pricing and resource allocation; 2.) obstacles to fixed-mobile convergence; 3.) reduced consumer welfare.

Mobile networks have matured to the stage where the general principles used to determine the termination rates should be no different to those applied for a fixed network. In particular, the exclusion of non-traffic sensitive costs from the calculation of

mobile termination rates will improve the general level of symmetry between fixed and mobile rates and reduce the subsidy of these mobile operators by fixed operators with wide positive welfare effects,

Further regulatory approaches could be contemplated (e.g. symmetry at current fixed rates as a matter of principle, as in the US), based on the need to eliminate a termination externality distorting fixed-mobile substitution.

The exclusion of common costs from the increment in both fixed and mobile bottom up LRIC models, and its recovery through other non-regulated services, is supported by economic theory as it approaches a first-best pricing policy (pricing at marginal cost) and reduces externalities and distortions, as explained in this submission.

The likely impact of these measures on retail prices and usage are expected to be positive as they allow for a better allocation of resources and leaves more room for the interplay of market forces.

In terms of LRIC modelling two issues are crucial for the adequate implementation of the proposed measures: the definition of the coverage network and the choice of scale for the efficient operator in both fixed and mobile networks.

In the case of mobile networks, coverage should be defined, in line with the Commission's proposal as *"the capability or option to make single call from any point in the network at a point in time, and capacity represents the additional network costs which are necessary to carry increasing levels of traffic."* However, references to "minimum coverage" as they stand in the current Draft contradict the main definition and should be deleted. Furthermore, in order to avoid an unharmonized implementation, the definition should be further explained in the recommendation to be **the total availability of national public mobile network signal across outdoor and in-building areas**. It should also be stated that the coverage network must include the necessary minimum backhaul transmission, switching architecture, inter-switch transmission, ports and supplementary network management systems to enable the national radio network to function as a network.

Finally, in relation with the efficient scale of an operator for the purposes of the LRIC cost modelling, in the case of mobile networks the Draft Recommendation adopts a sound approach consisting in establishing the scale as 1/Number of Mobile Infrastructure Operators, irrespective of whether a particular operator has actually



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reached that scale. There is no reason why the same economic criterium should not be extended to modelling fixed termination rates. Consistency with the mobile case requires that in areas where alternative fixed networks have been deployed it is reasonable to expect that they can achieve $1/F$ market share, where F is the number of fixed access infrastructure providers within that coverage. In these areas, as it is also the case for mobile networks, a number of alternatives network would compete on the basis of same coverage.