Commission for
Communications Regulation

Mobile Termination Rates:
Draft Bottom Up Pure Long Run Incremental Cost Model

Submissions to Consultation Document No. 15/19

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Content

Section

1. Eircom Group

eircom Group

Response to ComReg Consultation Paper:

Mobile Termination Rates:
Draft Bottom Up Pure Long Run Incremental Cost Model

ComReg Document 15/19

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DOCUMENT CONTROL

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The comments submitted to this consultation are those of Meteor Mobile Communications Ltd. (MMC) and eircom Ltd (eircom) collectively referred to as eircom Group.

Introduction

ComReg Decision of November 2012[1] set the expectation that the Cost Model would deliver a Pure LRIC based Mobile Termination Rates (MTR) by July 2014[2]. In October 2014 ComReg advised that this supplementary consultation would be published before the end of 2014 and stated its intention to issue a final Decision in spring 2015. This slippage has compounded the delay that has been caused by Vodafone's appeal. We now expect that a final Decision could be made in June 2015 at the earliest with the decision taking effect over a full year later than intended, following the appeal.

eircom repeats its call for a final Decision to be issued as soon as possible with a view to ending the inequities that prevail as a result of the dichotomy in the current application of price controls in the fixed and mobile markets. As a result, regulation of the Irish telecoms market continues to operate in contravention of ComReg's own objectives and the European Commission's 2009 Termination Rate Recommendation[3], which seek to ensure that MTRs and Fixed Termination Rates (FTRs) should be treated consistently regarding the application of Pure LRIC, in order to avoid competitive distortions by imposing a significant asymmetry in how costs are recovered between fixed and mobile services.

The final Analysys Mason report[4] that supports this consultation refers to positive developments in the market in the form of more inclusive price plans that encompass a higher portion of any--network calls and increased convergence of fixed and mobile offerings. eircom agrees that this has been enabled to a significant degree by the reductions in MTRs up to and since 2012, however competition, consumer interests and efficient investment incentives continue to be hampered by the fact that MTRs are currently set well above Pure LRIC and indeed LRIC levels. As a result fixed operators and smaller mobile operators continue to incurring undue additional cost in delivering any-network bundles. Furthermore the negative implications of this for competition in the mobile market have been compounded by the fact Meteor is now the network with the smallest market share following the acquisition of O_2 by '3'.

[1] http://www.comreg.ie/publications/decision_on_mobile_and_fixed_voice_call_termination_rates_in_ireland.583.104239.p.html

[2] http://www.comreg.ie/_fileupload/publications/ComReg14105.pdf

[3] European Commission Recommendation: "The Regulatory Treatment of Fixed and Mobile Termination Rates in the EU" (2009/396/EC), dated 7 May 2009.

[4] http://www.comreg.ie/publications/mobile_termination_rates_supplementary_consultation_analysys_mason_final_report.583.104774.p.html

Response to Consultation Questions

Q. 1 Following the submissions received in response to the MTR Model Consultation and Draft Decision (Document No 14/29s), ComReg has updated the draft MTR Model to make it a closer representation of a hypothetical efficient operator in the Irish market. Do you agree with the modifications made to the MTR Model by ComReg, as detailed above and in the updated MTR Specification Document? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence supporting your views.

In general eircom considers the adjustments to the model to be appropriate. Indeed a number of the adjustments reflect the input that eircom provided in its response to the previous consultation. We consider the alignment with the data supplied by operators to the Quarterly Market report to be the correct approach given that any data submitted in response to specific MTR related data requirements should align with Quarterly Market data in any case.

Regarding the adjustment to the proportion of voice traffic carried across 2G and 3G networks in rural areas such that it no longer has the same profile as that observed in denser geo-types, we agree that there should be a difference between the rural and non-rural geo-types. ✂ This appears to have been addressed in the model in respect of the urban and suburban network assumptions, however in the case of the rural network, the original assumption that 40% of rural voice traffic would be carried on the 2G network remains. While it is difficult to accurately project the retirement of 2G and though it is likely that plans for 2G retirement may vary by operator, eircom considers that the forecasted portion of voice traffic carried in rural areas should be adjusted downwards towards that of non-rural areas.

Q. 2 Which forecast scenario: Scenario A (i.e. operator led forecasts of mobile data traffic excluding a significant element of dongle traffic); or, Scenario B (i.e. forecasts based on international expert analysis and including all dongle traffic), do you consider to be more appropriate in the context of determining a MTR based on a hypothetical efficient mobile operator in the context of the Irish market. Please provide appropriate reasoning and any relevant evidence to support your views. In the case where you do not agree with either scenario, you are requested to submit future mobile data usage per subscriber to support your views.

As outlined in response to question 1 eircom supports ComReg's preference for scenario B. Our reasoning differs somewhat to that presented in the supplementary consultation document. We recognise the importance of factoring data usage into the cost model however we do not consider dedicated mobile broadband subscriptions (dongles) to be the key driver of the growth in data usage on mobile networks. In fact ComReg's Quarterly Market Report shows a 13% decline in dedicated mobile broadband subscriptions dropping from 500k in Quarter 4 2013 to 433k in Quarter 4 2014. In contrast the same report shows a 28% growth in mobile voice and data subscriptions (assumed to correlate to smart phones) using the 3G and 4G networks, growing from 2.6m to 3.3m[5].

[5] http://www.comreg.ie/_fileupload/publications/ComReg1527.pdf

Applying these subscriber numbers to the average usage per subscriber[6] we estimate that dedicated mobile broadband subscribers accounted for 56% of data usage in Quarter 4 2013, dropping to 40% of data usage in 2014, suggesting an almost complete reversal in the significance of smart phones relative to dongles in just one year. Therefore eircom expects smartphones to play a significant role in the growth of data usage during the period addressed by this review (up to 2019).

As such eircom would agree that Scenario B, involving significant growth in data traffic to be the appropriate choice. A number of factors will influence the magnitude of the growth in mobile data volumes. The expansion of 3G and 4G coverage, combined with the emergence of large and unlimited data bundles will of course drive this growth however this is likely to be countered by fixed data volume growth with fibre rollout and the National Broadband Scheme which will compete for what is ultimately a finite demand for data. Therefore it is difficult to predict the degree to which mobile data will grow. However, having analysed a significant yet lower magnitude of data growth in the model, we consider that a more moderate yet still realistic growth in data will yield similar results.

Q. 3 Do you have any comments or observations on the 2014 Analysys Mason Report?

We note that Analysys Mason continues to recommend the adoption of a Pure LRIC based MTR. As outlined in the introduction to this response, eircom considers the need to immediately address the dichotomy in the current application of price controls in the fixed and mobile markets should also be a primary concern given the magnitude of excess charges that are being paid for mobile call termination. Figure 1 demonstrates the significant gap between the current MTR relative to the LRIC and Pure LRIC rates, highlighting the fact that the delay in moving to Pure LRIC is causing significant market distortions.

	MTR Price Control	Percentage of Pure LRIC
Current MTR	€0.0260	388%
MTR calculated using LRAIC+ under Mobile Data Traffic Scenario B	€0.0087	130%
MTR calculated using Pure LRAIC under Mobile Data Traffic Scenario B	€0.0067	100%

If ComReg concludes once again that Pure LRIC remains a valid basis upon which to determine the MTR price control, the rapid implementation of this across both fixed and mobile call termination should now be its primary focus. We refer ComReg to the eircom paper submitted to ComReg on the 2nd of January 2013 which highlights the direct and indirect negative effects that this asymmetry has on eircom's ability as a fixed operator to compete against mobile operators both in terms of subscriptions and usage which ultimately impact eircom's ability to invest.

[6] http://www.comreg.ie/_fileupload/publications/ComReg1527.pdf Figure 4.3.5 - GBs/Smarthone Q4 2013 0.7, Q4 2014 1.3, GBs/Dedicated Mobile Broadband Subscriber Q4 2013 4.7, Q4 2014 6.6.

As regards the Analysis Mayson commentary on changes in the operators and changes in the market, arguably many of the positive aspects referred to in the report highlight aspects which lessen the impact of the move towards Pure LRIC on operators. In the case of the. acquisition of O2 by '3', as a single entity the networks are now internalising traffic that was previously subject to MTRs for both former operators. This only addresses the negative impact of excessive MTRs within the new entity, while anomalies still remain for off-net traffic to and from '3' and more importantly for other fixed and mobile operators incurring MTR charges. Therefore the need for symmetrical treatment of MTRs relative to FTRs remains undiminished.

More generally, the effect of the reductions in MTRs to the current 2.6c level merely reflects a piecemeal delivery of the benefits of reduction in MTR. In order to ensure that the fixed and smaller mobile operators can continue to compete through offerings such as unlimited off-net calling, the consultation process must be concluded and a final decision issued without delay.

We note that on page 15 of the Analysys Mayson report that it is stated that "*In early 2013, eircom announced it would scale back its eMobile business*." This is inaccurate. eircom is quoted in the article[7] as stating that eMobile would be marketed more as a proposition than a standalone brand. eircom has not indicated that it wold scale back its eMobile business ✂ and eircom will continue to drive new eMobile subscriptions through triple and quad play offerings as had been indicated in the article. This change of focus is a very good example of the positive market developments that are being enabled through lower MTRs as entities such as eircom with a lower mobile market share and indeed new market entrants are empowered to compete with the incumbent mobile networks. However more competitive tension can be brought to bear and this once again highlights the urgent need to bring the anomaly of asymmetric MTR and FTR price methodologies to an end.

Q. 4 Do you have any comments or observations on the revised Decision Instrument at Annex 1 of this Supplementary Consultation Document?

eircom does not have any comments to make in relation to the revised Decision Instrument at this time.

[7] http://www.independent.ie/business/irish/eircom-set-to-scale-back-its-emobile-operations-29090501.html

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7th May 2015

Kjeld Hartog
ComReg
Abbey Court
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Dear Kjeld

Mobile Termination Rates – ComReg Document 15/19

I refer to ComReg's consultation document 15/19 regarding the cost model for mobile termination rates.

When ComReg began its current review of the cost of mobile termination rates in 2012, there were four separate access network operators in the market, and this was also the case when ComReg began building its cost model. In 2014, the Hutchison Group acquired O2 Ireland, and is now beginning the process to consolidate the two previously separate businesses of O2 Ireland and Three Ireland. This consolidation will include networks and infrastructure which is relevant to ComReg's model for deriving a cost based Mobile Termination Rate, however it is too early in the consolidation process for Three to be able to precisely state what the effect will be.

On this basis, it would be premature for Three to provide specific responses to ComReg at this time, however we are concerned that ComReg's model assumes a three-operator market from 2015 to 2032. Given that the remedies imposed on Three as part of the merger include entry of two new MVNOs, with at least one to have the option of becoming a full MNO, the premise on which the market share is built may be invalid. Given such a fundamental change in the market structure, Three is of the view that ComReg should re-consult to gather opinion on how the model should be adjusted to reflect this.

Without prejudice to the above, Three reserves the right to raise any points made by third parties in response to this consultation or any of the relevant preceding consultations in any subsequent challenge to ComReg's resulting decision.

Yours Sincerely

Tom Hickey

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Re: Submission to Comreg Consultation Document No.15/19: Mobile Termination Rates: Draft Bottom Up Pure Long Run Incremental Cost Model Supplementary Consultation Document (the "Supplementary Consultation")

Tesco Mobile Ireland ("TMI") welcomes the opportunity to respond to the Supplementary Consultation.

This response should be read in conjunction with TMI's response of 20 June 2014 to ComReg 14/29 which is attached for ComReg's convenience (see Annex) as many of the same points remain valid.

TMI very much appreciates the modifications which COMREG has made to the model, in particular in Chapter 2, based on: (a) operators' feedback to the previous consultation; and (b) the changes in the market place (in particular, the recognition in the Consultation (e.g., pages 13, 18 and 19) of the Telefonica/Hutchison Whampoa transaction in regard to O2).

As TMI is not an MNO (i.e., TMI does not have its own mobile network), many of the model assumptions set out in the Consultation are not relevant to an MVNO operating model. So TMI would like to make a general overarching submission rather than addressing the four questions which are very specific and much more MNO-focussed.

It is imperative that ComReg is mindful of the "bigger picture" and, in particular, the critically important pro-competitive role of MVNOs in the Irish market (as recognised by the European Commission in its Telefonica/Hutchison Whampoa decision) and therefore the final Decision which results from this Supplementary Consultation should set MTRs at a level which facilitates, rather than restricts, competition from MVNOs. This is all the more important given the increased concentration, from 4 to 3, of MNOs in the Irish market and the limited chances of there being an additional MNO capacity being added to the Irish market.

TMI's primary concern is that COMREG needs to consider more fully and proportionately the implications of the MVNO model. This is all the more so because there are likely to be further MVNOs joining the Irish market because of the remedies agreed in the Telefonica/Hutchison Whampoa decision.

TMI believes that, in that context, as a matter of European Union law, COMREG (as an emanation of the Irish State) must do everything reasonable to facilitate MVNOs being competitive and ensuring competitive MTRs would be a necessary step in this context.

In essence, therefore, we welcome the changes made and the recognition of changes in the market. However, we submit that ComReg needs to go further and amend its final Decision to recognise:

a. the strategic and competitive significance of MVNOs (as recognised by the European Commission in the Hutch/O2decision of 28 May 2014) and
b. the projected entry of MVNOs given the remedies in the Telefonica/Hutchison Whampoa decision. This is all the more so given the role which the European Commission believes MVNOs will play (and need to play) in the Irish market: http://europa.eu/rapid/press-release_MEMO-14-387_en.htm and the Commission decision generally (including recitals 120, 270, 271, 701, 704, 973 and the MVNO remedy/commitment generally).

If it would assist COMREG's deliberations, we would be happy to meet with you to discuss what more can be done to enable and foster further competition from the MVNOs to the benefit of all consumers in Ireland.

4. Vodafone Ireland Limited

Vodafone Response to ComReg Supplementary Consultation: Mobile Termination Rates: Draft Bottom Up Pure Long Run Incremental Cost Model

Ref. Submission re ComReg Document 15/19

Response Date: 07.05.2015

Important Legal Disclaimer

Vodafone maintains the objections set out in the part-determined High Court appeal bearing record no. 2012/465MCA which remains pending before the High Court against ComReg's choice of "Pure LRIC" as an appropriate cost control methodology for the Irish market, and Vodafone's response to this supplementary consultation is strictly without prejudice to those over-arching objections and to the determination of that Appeal. As a consequence, it has not been possible for our response to this supplementary consultation to include an exhaustive list of the issues that Vodafone has with the new ComReg model and/or the consultation process and Vodafone reserves the right to raise further queries, issues and specifications. It is important to note that this response needs to be read in conjunction with Vodafone's submissions and pleadings in the existing Appeal (including the analysis of Frontier Economics in the context of the existing Appeal) and Vodafone's previous consultation submissions, which all form an essential part of Vodafone's response to this consultation.

It is again Vodafone's position that the new rates proposed in ComReg's draft Decision appended to Supplementary Consultation 15/19 are unlawful. Vodafone does not believe that ComReg has met its legal obligations in purporting to introduce these new rates. In particular, Vodafone does not believe that ComReg has satisfied the obligations set out in Articles 8 and 13 of S.I.334 of 2011 of the EUROPEAN COMMUNITIES (ELECTRONIC COMMUNICATIONS NETWORKS AND SERVICES) (ACCESS) REGULATIONS 2011. Vodafone also notes the precedent set in ECAP 2004/1 where it was established that ComReg "is ultimately responsible for the integrity of its own analysis", however Vodafone has serious concerns regarding the integrity, robustness and general accuracy of the model, and must reserve it's position to raise these concerns in the future, if these issues are not addressed to the satisfaction of Vodafone in a subsequent consultation procedure.

Executive Summary

Vodafone welcomes ComReg's supplementary consultation on Mobile Termination Rates.

However, based on the evidence presented, Vodafone considers the current basis for decision to be deficient in a number of respects.

- ComReg fails to establish the proportionality of a "Pure LRIC" based cost regulation in the Irish market. The Analysys Mason report commissioned by ComReg does not provide quantitative evidence that would support the conclusion that "Pure LRIC" is in fact the least intrusive regulatory measure to remedy the competition bottleneck of the wholesale termination market. The conclusions drawn with respect to efficiency, competition and equity remain theoretical and data presented does not establish the superiority of a "Pure LRIC" price control on the basis of welfare considerations. As the European Union examples of Germany, Finland and the Netherlands illustrate the decision on the proportional costing methodology remains a national one that depends on local market characteristics and analysis.[1]

- One significant new factor since the previous consultation is the calculation of "LRAIC+" rates that appear to gradually move towards or even below "Pure LRIC" levels. Under Article 13(3) of the Irish Access Regulations and in line with the European frameworks "the Regulator shall ensure that any cost recovery mechanism or pricing methodology that it imposes under this Regulation serves to promote efficiency and sustainable competition and maximise consumer benefits". ComReg thus would be required to provide a quantitative analysis on both the welfare effects of different costing methodologies under consideration of the model's results as well as the effects on competition. Only after conducting this analysis ComReg can justify why, specifically in the Irish market, a price control remedy based on its "LRAIC+" price does not address the competition problem identified.

- Regardless of the choice of the appropriate costing methodology, Vodafone's detailed review of the updated MTR model reveals that the model requires further iterations and is not fit for purpose to determine either a "Pure LRIC" or "LRAIC+" cost estimate for the Irish market.

- Our latest review illustrates that the revised model remains deficient in a number of areas and continues to produce questionable results, as exemplified by the overall distribution of network costs as well as erratic investment cost dynamics and an oversimplified modelling approach.

- The model's underlying inputs and assumptions, in particular the assumed "hypothetical efficient operator", appear to be factually flawed and unable to provide a true approximation of the actual costs incurred by a mobile operator in Ireland.

- An even greater concern is that changes to the model appear to be arbitrary and inconsistent, calling into question the objectivity and reliability of the model as such.

- Finally, the changed market circumstances in Ireland after the recent merger are not sufficiently reflected and considering the forward looking nature of the proposed regulation a separate and more detailed consultation on this matter seems inevitable.

[1] In accordance with BEREC's latest termination rates snapshot these countries haven't adopted a "Pure LRIC" approach to date. Further, Estonia continues to apply a benchmark measure until June 2015.

Faced with the multitude of uncertainties and the effect of individual and cumulative errors observed in the current model Vodafone concludes that ComReg is not in a position to assert with confidence that its proposed methodology and estimated rate will fulfil its legal duties and obligations.[1]

The remainder of this response is structured as follows:

- In section 1 we revisit (subject to the above disclaimer) the choice of "Pure LRIC" based on economic rationales and the current estimates provided for levels of both "Pure LRIC" and "LRAIC+".
- In section 2 we identify key issues with ComReg's current modelling of a "hypothetical efficient operator" and outline requirements for further analysis and consultation.
- In section 3 we respond to ComReg's specific questions outlined in the Supplementary Consultation document which are not elsewhere addressed in this response.

[1] This is in line with previous legal precedence such as the ECAP 2004/01 ruling stating that ComReg "is ultimately responsible for the integrity of its own analysis"

1. Choice of Pure LRIC

Vodafone remains concerned about the appropriateness of the application of "Pure LRIC" in the context of the Irish market.

ComReg commissioned Analysys Mason to update their 2012 report which suggested the implementation of a "Pure LRIC" measure. The present report continues to claim that "Pure LRIC" is the most suitable choice for regulating wholesale voice termination in Ireland. However, the factual grounds presented by Analysys Mason based on efficiency, competition and equity considerations in conjunction with the proposed rates published in the draft MTR model developed by Deloitte do not support this conclusion.

- **Economic efficiency**

Analysys Mason states that "Pure LRIC" best captures "allocative efficiency" which they define as "average revenue being equal to marginal cost". More generally in the context of regulating wholesale termination rates "allocative efficiency" can be understood as the determination of prices that best reflect the underlying costs of service provision.

To this end it is worth revisiting some key economic propositions in the context of network industries. The most important one is the significance of fixed costs which require an adjusted model of profit maximisation. This essentially alters the economic equation appropriate in the context of mobile telecommunications.

In the standard economic model the competitive equilibrium follows the marginal cost rule as proposed by Analysys Mason. The marginal cost curve cuts the average cost curve at its minimum. This implies that marginal costs always cover (average) production costs. However, the situation in the telecommunications industry is a different one. Due to the importance of fixed costs the common assumption of increasing marginal costs does not hold: Marginal costs will always be lower than (average) production costs. Therefore any costing methodology based on the application of the marginal cost rule will inevitably lead to an under-recovery of costs, as is the case with the application of "Pure LRIC". The implementation of "LRAIC+" on the contrary takes these particularities into account and is therefore a better cost estimate to reflect underlying network economics as it ensures the recovery of common costs from the termination service.

Further, Analysys Mason argues that "Pure LRIC" would lead to a more efficient market outcome as "mobile service providers would have opportunities to recover more of their costs from their own customers, rather than subscribers of other networks" relating this to "productive efficiency". In other words, Analysys Mason suggests that a market distortion due to the regulation of the wholesale termination market below costs through "Pure LRIC" will lead to a more efficient competitive outcome in the retail market. Clearly, this logic is flawed as the under-recovery of costs ultimately leads to a distortion of market forces and existing market equilibria. Vodafone has stated previously that the "waterbed" effect may be one result of such a measure. Other longer term consequences would be reduced profitability which will have a knock-on effect on investment as well as innovation and ultimately overall welfare.

This also makes the argument around "dynamic efficiencies" highly questionable. Generally "dynamic efficiency" can be related to the overall efficiency evolution over time driven by technological change. Analysys Mason fails to provide sound empirical evidence for their assumptions and the effects they ascribe to lower termination rates. In fact it is undeniable that there will be some detriment to mobile network operators which will stand to lose money that otherwise would have been available for investment in innovation or network quality. While there is certainly evidence that fixed operators will gain from a decrease in termination rates, it is less clear that consumers have

actually benefitted from this in the context of Ireland. Without answering this important question it is unclear why a "Pure LRIC" costing methodology should be preferred in the Irish context.

- **Competition**

Analysys Mason observes that since the start of 2013 the Irish market has seen a move towards convergence, larger bundles as well as larger "off-net" call allowance. They claim that the comparably lower level of termination rates has contributed to this development (although there is no clear evidence of this) and thus assume that a further reduction of the rate (irrespective of the methodology proposed) will induce further welfare enhancing market changes.

While Vodafone acknowledges and supports that the Irish market has changed significantly since the last review, Analysys Mason's notion that these are directly attributed to the change in mobile termination rates remains questionable and does not give any clear direction on the decision of an adequate costing methodology. The complexity of the mobile market suggests that many factors influence pricing decisions and market behaviour. Therefore without any quantitative evidence Analysys Mason's portrayed relationship seems speculative at best.

Even Analysys Mason acknowledges that price reductions may be largely attributed to more "aggressive pricing from competitors" (see p.7). These may be linked to changes in market structure, e.g. in expectation and as an aftermath effect of the recent merger, rather than reductions in MTR rates as such. However, without a detailed empirical analysis that tests the statistical significance of different factors it is not possible to come to an informed conclusion.

However, even if an ex post assessment of the Irish market were to indicate that a reduction in MTRs made a difference, this would not necessitate the superiority of "Pure LRIC" over a "LRAIC+" measure. This is simply due to the fact that the current rate resembles a "LRAIC+" more than a "Pure LRIC" value and would thus suggest that welfare benefits Analysys Mason attributes to "Pure LRIC" would equally apply under a "LRAIC+" measure. Taking into account that the forward looking alternatives of "Pure LRIC" and "LRAIC+" proposed by ComReg are both low and towards the end of the proposed time horizon gradually converge the introduction of "Pure LRIC" would be in no relation to the potential competitive distortion brought about by a regulation below costs.

Further, the changes in Ireland's market's composition discredit the arguments presented around the benefits of smaller operators. A more detailed account of this can be found in the analysis of Frontier Economics that accompanies Vodafone's response.

Therefore the positive impact of "Pure LRIC" on competition portrayed by Analysys Mason lacks rigorous analysis and proof of any causal linkage between MTR reductions to the level of "Pure LRIC" and increased mobile-mobile as well as fixed-mobile competition in the Irish market. Even if Analysys Mason had disaggregated factors in relation to the applicable cost standard and could claim favourable effects of a reduction in MTRs, the fact that a termination rate above "Pure LRIC" brought about these competitive changes would raise serious doubts that "Pure LRIC" would constitute the least intrusive regulatory measure. The evidence thus does not allow ComReg to conclude that a "Pure LRIC" termination rate of € 0.0071 (Deloitte estimate for 2015 under Scenario A) would have significant positive effects to a "LRAIC+" rate of € 0.0095 as currently proposed.

- **Equity**

Finally, Analysys Mason claims that "all subscribers who would pay lower prices overall as a result of "Pure LRIC" MTRs would benefit, such as fixed-only subscribers" (see p.11). Again, Analysys Mason fails to qualify this preposition in the Irish market context.

Interestingly, the increasing importance of mobile technology relative to fixed as exemplified in the Analysys Mason report (see p.22) by the proportion of fixed-only to mobile-only households leads to a very different conclusion. In fact any cumulative welfare effects ascribed to fixed-only subscribers can be assumed to be continually declining whereas any changes to the mobile market, e.g. due to reduced pricing flexibility of specifically targeted tariffs in order to minimise losses made at the wholesale level, can be assumed to increase.

Further, a simple review of Eircom's per minute charges to Mobile Networks shows an increase in the per minute charge post the reduction in MTR to 2.6c.

Eircom Charge for calls from Fixed to Vodafone

	Package name	rate
Apr-12	200	23.7
Current	eTalk 2014 Off Peak	26

Source http://www.eircom.ie/bveircom/pdf/Pt2.4.1.pdf and http://www.eircom.ie/bveircom/pdf/Pt2.3.9.pdf

Finally, with the proposed rates for ""Pure LRIC"" and "LRAIC+" gradually approaching each other any potential welfare effect of "Pure LRIC" would be minimal at best and in no relation to the market distortions accruing from a regulation below costs.

	Pure LRIC		LRAIC+		Differential Pure LRIC to LRAIC+	
	Scenario A	Scenario B	Scenario A	Scenario B	Scenario A	Scenario B
From date of Decision to 31 December 2015	0.0071	0.0067	0.0098	0.0087	0.0027	0.002
1 January 2016 to 31 December 2016	0.0068	0.0064	0.0088	0.0077	0.002	0.0013
1 January 2017 to 31 December 2017	0.0065	0.0061	0.0078	0.0067	0.0013	0.0006
1 January 2018 to 31 December 2018	0.0062	0.0058	0.0069	0.0058	0.0007	0
1 January 2019 to 31 December 2019	0.0059	0.0055	0.006	0.0049	0.0001	-0.0006

Source: ComReg 15/19 proposed termination rates

Therefore, Vodafone requires ComReg to provide a detailed and quantitative analysis of these effects before claiming that "Pure LRIC" constitutes the most proportionate form of regulation.

Welfare effects: Pure LRIC vs LRAIC+

The consideration of different cost standards, in practical terms, reduces to an assessment as to whether the proposed level of MTR is appropriate in balancing short-term effects, i.e. lower wholesale prices, with the longer-term socio-economic impacts which accrue from incentivising investment, i.e. quality improvements and efficiency. Neither ComReg nor Analysys Mason have provided a detailed analysis of these effects in the Irish market context and thus fail to establish the proportionality of a "Pure LRIC" cost measure.

In particular, ComReg should have:

- Compared competitive distortions under "Pure LRIC" and "LRAIC+" and assessed potential consumer benefit considering the impact of recent market interventions such as the imposed merger controls.

- Quantified effects highlighted in Analysys Mason's report as a result of changed market circumstances to allow an assessment of the different factors relevance.
- Included a comparative assessment of expected competition and welfare effects of "Pure LRIC" versus "LRAIC+" rates based on the draft model's estimates.

Considering the economic arguments in favour of "LRAIC+" as detailed above and in previous consultations, Vodafone remains of the opinion that "LRAIC+" is a more appropriate cost standard in the Irish market.

3. The hypothetical efficient operator in the Irish context

In order to estimate an appropriate termination rate in the context of the Irish market, the assumptions and inputs around the hypothetical efficient operator are essential. It is for this reason that Vodafone is surprised that ComReg did not issue a separate consultation on the relevant parameters and inputs of the assumed hypothetical operator after significant changes to the mobile market occurred with the merger between H3GI and O2. Instead, ComReg changed key inputs to the model without consideration of future effects that these market changes will inevitably have.

In particular, we believe further clarification and consultation is needed on the following key issues:

1. Market shares

ComReg has failed to assess the impact on effective market shares among players.

ComReg disregards the fact that the assumption of a 1/N market share requires further qualification, in particular given the merger controls in place after market consolidation. The impact of the merger on the market cannot be pictured in the simplified way that market shares of each market player (or hypothetical market player) suddenly increase from 25 to 33% (see also Frontier Economics account on unrealistic 'step changes' on this matter).

Firstly, it seems unrealistic to assume that two distinct networks "merge" overnight. While there can be certain synergies the consolidation of two networks is likely to take a significant amount of time and investment.

Secondly, the competitive dynamics of the merger will have an important bearing on network costs and retail market shares. In particular, the current merger control which requires Three-O2 to host two new MVNOs on their network in order to ensure effective competition is unlikely to bring about a hypothetical 1/N market split.

The Annex to the MTR Recommendation[1] sets out that the efficient market shares to be used by NRAs in modelling MTRs is 20%. It further sets out that NRAs must "*prove*" that market conditions would imply a different minimum efficient scale before it can deviate from this scale.

ComReg has not provided any substantive reasoning, which reflects the full range of market conditions, to justify a sudden change towards a 33% market share. If ComReg intends to model the Irish rather than a hypothetical market on a forward looking basis ComReg needs to carefully consider market realities after the merger which are likely to affect market share dynamics.

Considering the complexity of this issue, Vodafone believes that ComReg must carry out a full consultation setting out its detailed reasoning for the proposed market share level and affording interested parties an adequate opportunity to consider and comment on these.

[1] COMMISSION RECOMMENDATION of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC)

2. Spectrum allocation

The spectrum allocated to the hypothetical operator both for historical as well as future time periods does not align with what could be reasonably expected in the Irish market context.

Prior to the 2012 Auction the three GSM operators in Ireland had 7.2MHz of spectrum in the 900MHz band. Additional spectrum was reserved by Comreg for another potential GSM operator. The draft model, however, uses a figure of 8.6MHz which is incorrect.

In the period post 2015, the model attempts to re-distribute the available spectrum using 1/N and a new market share of 33%.

Vodafone disagrees that this is a reasonable way of assigning spectrum to a hypothetical operator as the spectrum has not been redistributed. As a result of the Three-O2 merger and EU DG-Competition process the spectrum assignments are as follows: Vodafone and Meteor are assigned 10MHz of the 900MHz band. Hutchison have 15MHz available but must make 30% of capacity available to specified MVNOs and also must offer 5MHz of this spectrum to one of these MVNOs. It is entirely reasonable therefore to assign 10MHz to the hypothetical operator post 2015, 5MHz for GSM 900 and 5MHz for UMTS900. ComReg has not aligned spectrum allocations with post-merger conditions in the Irish market. A proportional allocation according to a flawed market share assumption is further unsuitable.

Therefore, ComReg should have consulted on appropriate allocations on the basis of both a historical and forward looking assessment to ensure adequate representation of a hypothetical efficient operator in Ireland.

3. Alignment of hypothetical efficient operator outputs with costs incurred by actual operators

ComReg claims that the modelled hypothetical efficient operator provides for " …efficient costs and scale, whilst at the same time enabling costs and technology assumptions to be closely aligned with those actually faced by the mobile network operators (**MNOs**) currently in the Irish market" (see p.9 ComReg 15/19). The actual outputs of the model, however, do not align with what could be reasonably expected from an existing operator in the Irish market. In particular the distribution of costs deviates substantially from historical and future market realities. While we provide more detail on this in our review of the updated draft model, at a more fundamental level this calls into question the appropriateness of some of the key inputs and assumptions in relation to the hypothetical operator. In order to ensure the integrity of the presented hypothetical operator in the Irish market, ComReg needs to carefully review current inputs and align outputs with top down calibrations based on actual rather than hypothetical market data.

4. Supplementary Consultation Questions

Q. 1 Following the submissions received in response to the MTR Model Consultation and Draft Decision (Document No 14/29s), ComReg has updated the draft MTR Model to make it a closer representation of a hypothetical efficient operator in the Irish market. Do you agree with the modifications made to the MTR Model by ComReg, as detailed above and in the updated MTR Specification Document? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence supporting your views.

ComReg claims to have updated the model to achieve a closer representation of a 'hypothetical efficient operator'. However, it appears that the model still produces results which appear to be arbitrary and bear no relation to the Irish market and costs observed therein.

Given the importance and implications of this decision it is worrisome that the consultants have neither included a sensitivity analysis nor a top-down calibration of the results to ensure the adequateness of modelled outputs.

Vodafone's detailed review of the "updated" model found changes in the model to be arbitrary, inconsistent and in parts impossible to assess on the basis of documentation provided. Further, as summarised in Annex 6 many issues identified previously haven't been adequately addressed. ComReg should have included all relevant and non-confidential data sources feeding into model inputs to ensure transparency

Based on its latest review, Vodafone believes that the model remains deficient in a significant number of areas which are detailed below.

Load module (p. 19 - 34 MTR Model Specification Document)

Market share

In the updated model the market share allocation changed significantly in comparison to the previous model. Whereas the previous version modelled a "hypothetical operator" entering the market in 2003 and gaining scale to a market share of 25% in 2007, the updated model assumes a constant market share of 25% for the modelling period from 2003-2014 and 33% for the periods from 2015-2032.

ComReg did not consult on whether these assumptions were reasonable both from a historical and a forward looking perspective. The supplementary consultation gives no explanations why market shares were assumed to be constant in the updated version of the model.

ComReg has failed to assess the impact on effective market shares among players. In fact competition dynamics under the terms set out in the merger control are unlikely to bring about an equal distribution in a setting with at least six significant players competing for market shares (3 MNOs, 3 MVNOs). As highlighted in section 2, ComReg failed to assess the impact and adequateness of market shares among players.

It follows from this that the assumptions made around traffic splits, which are linked to market share consideration are equally flawed.

Vodafone continues to contest the "simple linear regression" (p.23) performed by Deloitte as the limited number of 2013 data points considered disqualify the analysis. Moreover, the change in market structure calls for a re-assessment of the relationship with updated market data.

Taking into account the complexity of the market share issue as outlined above, Vodafone believes that ComReg needs to issue a separate consultation in order to adequately define a "hypothetical operator" in the Irish market.

Conversion Factor assumptions (d.4)

While Deloitte seemed to have intended to update the model workings of the conversion factors, the model still fails to address the issues outlined in Vodafone's response to the previous consultation round (14/29s). Basic sensitivity tests of the nominal full rate bit rate still leads to unexpected model outputs.

A 0.2.1.Voice output with Data Conversion rate for 2G set to 12200

		2013	2014	2015	2016	2017	2018
Pure LRIC	Nominal	€ 0.0075	€ 0.0073	€ 0.0071	€ 0.0068	€ 0.0065	€ 0.0062
	Real	€ 0.0075	€ 0.0072	€ 0.0068	€ 0.0064	€ 0.0060	€ 0.0057
LRAIC+	Nominal	€ 0.0102	€ 0.0100	€ 0.0098	€ 0.0088	€ 0.0078	€ 0.0069
	Real	€ 0.0102	€ 0.0098	€ 0.0095	€ 0.0084	€ 0.0073	€ 0.0063

A 0.2.1.Voice output with Data Conversion rate for 2G set to 16000

		2013	2014	2015	2016	2017	2018
Pure LRIC	Nominal	€ 0.0073	€ 0.0071	€ 0.0069	€ 0.0066	€ 0.0062	€ 0.0059
	Real	€ 0.0073	€ 0.0069	€ 0.0066	€ 0.0062	€ 0.0058	€ 0.0054
LRAIC+	Nominal	€ 0.0105	€ 0.0104	€ 0.0102	€ 0.0091	€ 0.0081	€ 0.0071
	Real	€ 0.0105	€ 0.0102	€ 0.0098	€ 0.0087	€ 0.0076	€ 0.0065

The explanation offered by Deloitte for this anomaly is not adequate. In a mixed Voice/Data system an increase in the assumed rate for data should increase the cost of Voice.

Busy hour traffic/ traffic load (c.2)

The calculation of busy hour traffic/network traffic load is inconsistent with actual network traffic. Deloitte would need to explain these deviations and adjust the model in accordance with operator submissions to ensure that the "hypothetical operator" modelled is within the range experienced by actual operators in the Irish market.

In the last response we explained that the 2G Busy hour traffic figure calculated by the model was not consistent with actual network traffic.

The previous model produced a 2G traffic in BH of 10,618 in 2011. Vodafone's 2G BH traffic at this time was more than [redacted] Erl. Taking this as the traffic for a 40% market share we would expect the HEO with 25% market share to have a 2G busy hour traffic of approximately [redacted] ERL.

Extract from Model Worksheet "Reference: Load > B1"
b1.13.2. Aggregate BH traffic by technology - erlangs (per hour all subscribers)

	2007	2008	2009	2010	2011
Overall traffic in overall BH	26,478	39,328	46,843	79,630	128,120
2G traffic in 2G BH	10,920	13,402	14,254	13,174	10,618

ComReg have adjusted the voice traffic up slightly – but it is still significantly below the [redacted] figure for 2G BH that we expect (Annex 1).

While we understand that a there will be variation between the HEO and actual traffic experienced by an operator this variation appears outside reasonable variation.

Network module (p. 35 - 69 MTR Model Specification Document)

Spectrum allocation

Spectrum allocations have changed in the updated model. The current spectrum allocation is flawed in two ways. Firstly, basing spectrum on the allocation key proposed and considering the historical market situation the spectrum allocated to the hypothetical operator should not exceed 7200 kHz up to and including 2012. Secondly, on the forward looking part of the model, spectrum allocations require to be aligned with adjusted market conditions found after the merger in the Irish market. A proportional allocation according to a flawed market share assumption is unsuitable.

Spectrum re-use

Vodafone remains concerned about applying a spectrum re-use factor of 10. This seems out of line with other European models and generally applicable network deployment practices. We therefore suggest amending the model and including a spectrum re-use factor of 12.

Minimum element requirements and spectrum

Vodafone notes that the spectrum assigned to minimum element requirements appears to be overstated.

Adjusted land area justification

ComReg noted that the proportion of traffic has changed in line with up to date CSO data. However, linked to that is a significant shift in traffic patterns that seem questionable. Vodafone therefore believes that further clarification on the issue is needed to ensure overall consistency.

Land classification used in previous (April 2104) consultation:

MTR Model Specification Document for Ireland. A Draft for Consultation Report for ComReg 10 April 2014

Table 11: Land area classification		
Urban	1,142	1.6%
Suburban	5,691	8.2%
Rural	62,964	90.2%
Total	**69,797**	**100%**

Land usage classification used in this consultation:

MTR Model Specification Document for Ireland A Draft for Consultation Report for ComReg23 February 2015

Table 11: Land area classification

Geo-type	Area (km^2)	Area (%)
Urban	803.3	1.2%
Suburban	836.8	1.2%
Rural	66,826.2	97.6%
Total	**68,466.0**	**100%**

Source: *CSO*[26]

The land usage classification used in the earlier model aligns more closely with the actual density of housing used in operators' planning tools - reflecting the actual cell radii experienced in practise. CSO data generally reflects historical town borders, which have not been changed to reflect the growth in suburban housing. The figure of 1.2% for suburban area certainly does not reflect the actual land usage we experience. Site Radii and traffic figures reported by Vodafone in urban/suburban/rural areas, and used in the model reflect these practical empirical figures. Making such a significant change to the land area classification without examining effect on other parameters adds significant uncertainty to the model. Further analysis is needed of the effect of this on the model outputs and in particular further calibration of 2G/3G traffic mix in these areas.

TRX and 3G radio dimensioning

While we note that Deloitte has included some type of rounding, this is still insufficient, as the round-up function is only embedded when the different network elements are aggregated. In order to adequately reflect network requirements, the function should be embedded throughout the network module sheets of the model.

The model has been adjusted to round up the required TRX number when the required TRX in a cell is calculated as being between 0 to 1, but not when the TRX needed is another fractional amount, e.g. 1.4. This is incorrect – the required TRX in each cell should be rounded up an integer number of TRX.

Colocation of sites

The system of allowance for co-located sites is not transparent. Because the coverage radii of sites operating at different frequency bands and difference technologies are different an ideal site layout for each band and technology will be different. For example the cost saving made by extensive co-location of 2100MHz sites on

previously installed 900MHz sites is mitigated by the need to install a larger total number of 2100MHz sites to achieve coverage. This additional cost should be included in the model.

The explanation of co-location logic in the Deloitte document is not adequate, for example formula (13) in the Deloitte document appears to be incorrect.

Network outputs/design

Vodafone would like to re-iterate that the principles underlying ComReg's proposed use of a scorched node approach accords with its view that the competitive conditions in the Irish market mean that the modelling of a hypothetical efficient existing operator should yield results which align strongly with the actual deployments of MNOs normalised for market share.

This requires modelled network elements to be roughly in line with deployed networks. However, the network outputs of the updated model provided by ComReg significantly deviate from expected results in a number of respects. Most strikingly the number of 3G radios deployed seems to increase disproportionally and bears no relation to actual 3G radios that can be reasonably expected to be built.

			2013	2014	2015	2016	2017	2018	2019	2020
Site	c1.RAN		1,460	1,842	1,929	1,828	1,724	1,621	1,560	1,569
BTS	c1.RAN		1 932	2 043	1 584	1 511	1 424	1 345	1 250	1 243
TRX	c1.RAN		4,229	4,229	4,229	3,885	3,527	3,052	2,757	2,695
BSC	c1.RAN		9	9	9	9	8	8	7	7
Node B	c1.RAN		1,438	1,791	1,890	1,791	1,689	1,588	1,530	1,539
3G radio	c1.RAN		11,083	17,021	23,748	21,860	19,950	18,006	16,906	17,099

Access network elements, extracted from b1. network outputs

In relation to that the number of TRX deployed seems to be disproportionally low. The actual number of TRXs deployed in Vodafone's networks stands at 17552 TRX. Even allowing for some sort of market share adjustment this would mean that in 2015 the number of TRXs of a "hypothetical operator" would be less than a third of that observed in the Irish market today. This variation calls into question the validity of the model and ability to predict costs in the Irish market context.

Transmission

The transmission network modelled by ComReg remains oversimplified. The apportioning of link quantities in order to allocate 2G and 3G sites to 2G and 3G networks as well as the lack of necessary dynamic redundancy requirements inevitably leads to an underestimation of transmission equipment costs.

Cost module (p. 70 - 99 MTR Model Specification Document)

Direct element unit CAPEX/OPEX

The changes made to unit CAPEX/OPEX costs seem to be arbitrary. In the absence of a coherent rationale or explanation for individual changes, it is not possible to validate or review the current unit costs.

Vodafone requires ComReg's consultants to further explain the rationale behind these 'corrections'.

2013 direct capex				
Element code	Element name	Updated model (2015)	Previous model version	Changes
E01_001	Site	88,392	97,257	-10%
E01_002	BTS	34,839	29,712	15%
E01_003	TRX	3,030	3,472	-15%
E01_004	BSC	861,703	912,784	-6%
E01_005	Node B	33,713	30,537	9%
E01_006	3G radio	20,197	17,908	11%
E01_007	RNC	1,317,259	1,429,789	-9%
E02_001	MSC-S	2,274,289	2,504,898	-10%
E02_002	GMSC	1,200	-	100%
E02_003	MGW	925,000	1,015,795	-10%
E02_004	HLR	750,000	762,711	-2%
E02_005	EIR	1,750,000	1,993,895	-14%
E02_006	AuC	750,000	863,572	-15%
E02_007	SMSC	400,000	335,176	16%
E02_008	MMSC	400,000	410,594	-3%
E02_009	IN	324,219	372,676	-15%
E02_010	NMC	31,975,376	48,826,823	-53%
E02_011	Signalling platform	10,000,000	10,603,591	-6%
E02_012	Number portability pla	1,000,000	866,929	13%
E03_001	Abis (BTS_BSC)	41,316	45,891	-11%
E03_002	luCS (RNC_MGW)	94,304	90,565	4%
E03_003	luCS (RNC_MSC/VLR	94,304	90,565	4%
E03_004	lur (RNC_RNC)	94,304	90,565	4%
E03_005	lub (NB_RNC)	41,316	45,891	-11%
E03_006	Nb (MGW_MGW)	94,304	90,565	4%
E03_007	E (MSC/VLR_GMSC)	94,304	90,565	4%
E03_008	A (BSC_MGW)	94,304	90,565	4%
E03_009	Mc (MSS/VLR_MGW	94,304	90,565	4%

Comparison of current to previous model UNIT CAPEX

WACC

ComReg assumes that the recently determined WACC rate is an appropriate measure of the weighted average cost of capital over the whole model period. As per Vodafone's previous remarks, this cannot be the case for historical periods, if the model is estimating MTR costs in the Irish market. WACC rates therefore need to be adjusted in accordance with historically relevant data points.

Total cost by element and year after economic depreciation

Looking at the distribution of network costs after economic depreciation, the distribution of costs seems unlike any operator in the Irish market, and in fact a mobile operator per se. An expected cost distribution would allocate around 50-60% to the Access layer, 30% to Transmission and 10-20% to Core related costs. In our consultation response to Comreg 14/29 (June 2014) we explained in detail why the Transmission cost are underestimated in the model and clearly stated that Transmission cost should be of the order of 30% of network capital expenditure.

Based on Access, Core, Transmission 2014 values extracted from model, c1. economic depreciation		
Access	384102551.5	73%
Core	92111543.88	17%
Transmission	53101800.7	10%
*excluding spectrum fees, VMS, wholesale billing platform		

Looking at the overall split of costs it seems that the proportion of access costs are overestimated, largely due to an increasing number of 3G Radio's. Further, the decreasing TRX and site costs do not seem to be in proportion to what could be reasonably expected (see Annex 2).

Pure LRIC estimates

There seems to be an underlying issue with the model workings in the "Pure LRIC" sheet. This relates to the annual element investment profiles with and without termination as well as the economic depreciation incremental unit outputs.

Generally, one would expect the model to produce results where the total annual element investment with termination shows less deviation from the one without termination (see Annex 3).

Further, one would anticipate depreciated capital costs per network element on an incremental basis to be greater than zero (Annex 4). However, this is not the case. The IuB (NB_RNC) link output is consistently negative. This is illogical and evidently wrong. Moreover, it is part of a bigger issue, namely the oversimplified modelling approach employed by Deloitte and clearly illustrates that the model as is cannot produce a reliable LRIC estimate.

Also, it seems that the 'termination' increment does not attribute any costs to Core network elements. This cannot be reasonably expected: For any terminating call the costs of the Core network elements are greater than zero given the modularity of network elements deployed in a given network. In particular the MSC-S with its switching capacity is elemental to terminating calls. The model thus does not appear to reflect the generally expected network workings in its output sheets.

This in combination with the issues highlighted in the report provided by Frontier Economics illustrates that the model as is cannot calculate a meaningful "Pure LRIC" estimate and is not fit for purpose.

LRAIC+ cost

Vodafone notes that ComReg and Deloitte devoted a very small section of their overall consultation documents to a significant change in the model, i.e. the inclusion of "LRAIC+". This surprises, as the modelled "LRAIC+" results seem to be unlike any other "LRAIC+" model published and do not display a cost recovery path that could be reasonably expected. Overall, sensitivity testing illustrated that the outputs appear to be less responsive to changes made.

Considering the lack of detailed documentation Vodafone feels it cannot conclusively comment on the "LRAIC+" outputs and requires ComReg to provide a more in depth account on this section of the model.

Model Calibration, sensitivity analysis and model testing

Section 4.3.2.of the Deloitte report states that "Finally, the results were tested so that, for a given total load, the number of sites, cells, and number of carriers calculated by the model was calibrated against the operators' reported data". In the absence of ComReg sharing the details of this calibration Vodafone cannot adequately comment on this.

Vodafone's review of the updated bottom-up model, however, reveals fundamental flaws in the model's assumptions, workings and outputs as outlined throughout this response and previous consultation rounds. This seems at odds with a tested and fully calibrated model reflecting operator's submissions. It also illustrates the importance of further consultation and model testing on Deloitte's side to ensure the appropriate functioning of the model.

It is for these reasons that Vodafone believes a further review of the model including an additional round of consultation is required to safeguard an appropriate MTR cost estimate in the Irish market context.

Q. 2 Which forecast scenario: Scenario A (i.e. operator led forecasts of mobile data traffic excluding a significant element of dongle traffic); or, Scenario B (i.e. forecasts based on international expert analysis and including all dongle traffic), do you consider to be more appropriate in the context of determining a MTR based on a hypothetical efficient mobile operator in the context of the Irish market. Please provide appropriate reasoning and any relevant evidence to support your views. In the case where you do not agree with either scenario, you are requested to submit future mobile data usage per subscriber to support your views.

Vodafone believes that operator-led forecasts are best placed to reflect Irish market realities (Scenario A).

When operators first built 3G networks large capacity was available – particularly for new operators. It was feasible in the short term to offer dongle traffic at very low prices, essentially filling empty networks. As networks fill with voice and smartphone traffic it will not be economically feasible to add additional capacity to support a further increase in the number of high-traffic dongles on these networks. Alternative strategies will be followed instead. These may involve handover of data traffic to Wi-Fi or other small networks or the limiting of high-volume data users using class-of-service algorithms.

Achieving the [redacted] for voice services has always been a key driver of network Capex spend. ComReg's revised MTR draft model uses a very simple methodology to combine voice and data traffic on 2G and 3G networks. Voice is considered to be equivalent to a 12Kb/s data stream and added to data traffic (or all translated to Erlang). Costs are apportioned by examining the ratio of voice traffic to total traffic.

We have in other parts of this and in our previous submission expanded on our view that this is a significant over-simplification of the cost drivers in building and operating a mobile network. Considering the current model set-up, scenario B would thus vastly overstate the relevance of overall data traffic. Taking this into account Scenario A, excluding a significant portion of dongle traffic, is the more appropriate way of analysing MTR cost.

It is for these reasons that Scenario A should be applied as the basis for mobile data traffic.

Q. 3 Do you have any comments or observations on the 2014 Analysys Mason Report?

See section 2 and also Frontier Economics analysis which forms an essential part of Vodafone's response.

Q. 4 Do you have any comments or observations on the revised Decision Instrument at Annex 1 of this Supplementary Consultation Document?

Given ComReg is consulting on the draft decision instrument including revisions to the modelled price then all parts of the model that feed into this price must be open to comment. ComReg in this current consultation has provided no clarification as to why it has effectively rejected a number of key positions set out in Vodafone's response to the previous consultation it is therefore not possible for Vodafone give an informed response to the key component of a price control decision i.e. the level of the price.

Annex 1

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
b1.13.Aggregate BH traffic by technology											
b1.13.2.Aggregate BH traffic by technology - erlangs (per hour all subscribers)											
Overall traffic in overall BH		5,886	6,366	7,341	8,427	58,552	72,718	72,912	110,945	164,014	222,034	348,620
2G traffic in 2G BH		4,953	5,325	6,078	6,809	12,000	14,294	15,776	14,031	10,058	8,182	6,202
3G traffic in 3G BH		53	94	183	408	44,419	55,884	54,333	94,420	152,168	212,398	341,315

Annex 2

Total economic costs (after economic depreciation), cost distribution across network elements

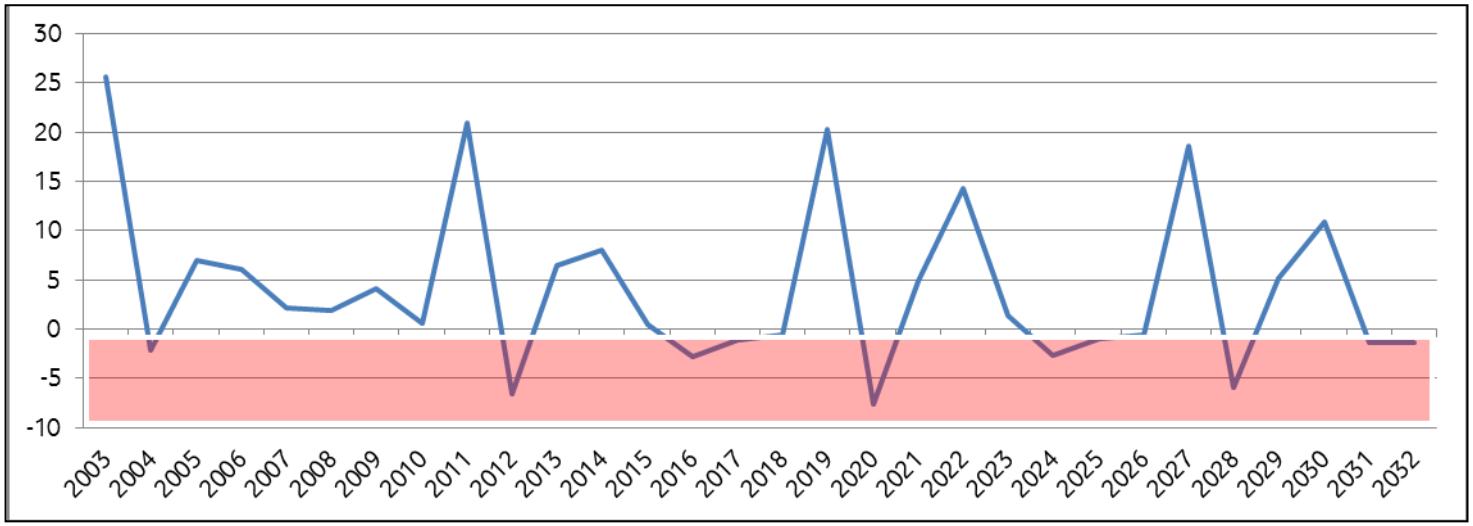
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	47 691 107	51 050 612	56 587 887	62 288 438	147 882 909	176 783 508	181 487 400	209 002 733	238 148 822	279 338 764	383 933 845	574 847 754	789 712 436	719 678 651	653 247 726	589 714 289	524 658 401	521 498 832	520 271 722	518 477 768	517 630 093	517 088 437	516 820 708	517 030 643	517 016 214	517 451 234	518 102 874	518 972 369
Site	1%	1%	1%	1%	3%	4%	4%	5%	6%	7%	8%	10%	11%	14%	18%	22%	27%	28%	29%	30%	31%	32%	33%	34%	35%	36%	37%	39%
BTS	48%	47%	46%	46%	30%	30%	30%	23%	15%	10%	5%	4%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
TRX	11%	11%	11%	10%	7%	7%	7%	5%	3%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BSC	7%	6%	6%	6%	4%	4%	4%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Node B	0%	0%	0%	0%	3%	3%	3%	5%	6%	7%	8%	9%	9%	8%	8%	8%	7%	7%	7%	7%	7%	7%	7%	7%	7%	6%	6%	6%
3G radio	0%	0%	0%	1%	18%	18%	17%	24%	33%	38%	43%	43%	42%	41%	39%	36%	33%	33%	32%	31%	30%	29%	29%	28%	27%	26%	26%	25%
RNC	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
MSC-S	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
GMSC	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MGW	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
HLR	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ER	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AuC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SMSC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MMSC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NMC	1%	1%	1%	1%	3%	3%	3%	4%	5%	6%	6%	7%	7%	6%	6%	6%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Signaling platform	1%	1%	1%	1%	2%	2%	2%	3%	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%
Number portability patform	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Abis (BTS_BSC)	7%	7%	7%	7%	5%	5%	5%	4%	3%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
IuCS (RNC_MGW)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IuCS (RNC_MSC/VLR)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Iur (RNC_RNC)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Iub (NB_RNC)	0%	0%	0%	0%	3%	3%	3%	4%	6%	7%	8%	8%	8%	8%	8%	8%	7%	7%	7%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Nb (MGW_MGW)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
E (MSC/VLR_GMSC)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A (BSC_MGW)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mc (MSS/VLR_MGW)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
900MHz 2G spectrum fees	8%	8%	8%	8%	6%	6%	6%	5%	3%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
1800MHz spectrum fees	10%	10%	11%	11%	8%	8%	8%	6%	4%	3%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
900MHz 3G spectrum fees	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
2100MHz spectrum fees	0%	0%	0%	0%	2%	2%	2%	2%	3%	4%	5%	5%	5%	5%	5%	5%	4%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Whole sale billing patform	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VMS	3%	3%	3%	3%	2%	2%	2%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

Annex 3

Pure LRIC: Annual element investment with termination - Annual element investment without termination

stment with termination		Annual element investment with termination - Annual element investment without termination																											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Site	c1.RAN	45.00	-2.00	8.00	6.00	-26.00	-4.00	23.00	0.00	45.00	-35.00	14.00	11.00	-30.00	0.00	0.00	0.00	76.00	-37.00	16.00	9.00	-29.00	0.00	0.00	0.00	75.00	-36.00	16.00	9.00	-28.00	2.00
BTS	c1.RAN	166.00	-10.00	36.00	20.00	19.00	25.00	-3.00	0.00	166.00	-10.00	36.00	83.00	-23.00	-72.00	-13.00	0.00	127.00	-11.00	37.00	85.00	-23.00	-74.00	-14.00	1.00	129.00	-11.00	43.00	79.00	-17.00	-76.00
TRX	c1.RAN	722.00	22.00	84.00	118.00	20.00	137.00	30.00	0.00	577.00	0.00	-108.00	118.00	20.00	88.00	-74.00	0.00	0.00	0.00	9.00	341.00	65.00	167.00	-163.00	27.00	-17.00	0.00	49.00	332.00	87.00	218.00
BSC	c1.RAN	1.00	-1.00	1.00	0.00	0.00	0.00	0.00	0.00	2.00	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	-1.00	0.00	0.00	1.00	-1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	-1.00
Node B	c1.RAN	0.00	0.00	2.00	6.00	-1.00	8.00	7.00	0.00	0.00	-8.00	9.00	5.00	-2.00	0.00	0.00	0.00	28.00	-10.00	10.00	5.00	-1.00	0.00	0.00	0.00	27.00	-9.00	10.00	5.00	0.00	1.00
3G radio	c1.RAN	0.00	11.00	21.00	74.00	155.00	0.00	0.00	0.00	0.00	11.00	74.00	79.00	217.00	0.00	0.00	0.00	0.00	0.00	0.00	454.00	226.00	0.00	0.00	0.00	0.00	0.00	6.00	461.00	233.00	7.00
RNC	c1.RAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	-1.00	1.00	0.00	0.00	0.00	0.00
MSC-S	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GMSC	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MGW	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLR	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EIR	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AuC	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SMSC	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MMSC	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IN	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NMC	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Signalling platform	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number portab lity platform	c2.Core	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Abis (BTS BSC)	c3.Tx	44.00	-1.00	7.00	3.00	-10.00	-3.00	8.00	11.00	29.00	-1.00	7.00	3.00	0.00	0.00	-5.00	-10.00	25.00	-1.00	7.00	3.00	0.00	0.00	-2.00	-12.00	24.00	-1.00	7.00	3.00	1.00	0.00
IuCS (RNC MGW)	c3.Tx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IuCS (RNC MSC/VLR)	c3.Tx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iur (RNC RNC)	c3.Tx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iub (NB RNC)	c3.Tx	0.00	0.00	1.00	3.00	-16.00	-2.00	9.00	0.00	0.00	-7.00	6.00	-5.00	-4.00	0.00	0.00	0.00	28.00	-10.00	7.00	-6.00	-3.00	0.00	0.00	0.00	27.00	-9.00	7.00	-6.00	-2.00	1.00
Nb (MGW_MGW)	c3.Tx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E (MSC/VLR_GMSC)	c3.Tx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A (BSC_MGW)	c3.Tx	0.00	0.00	1.00	0.00	-1.00	0.00	1.00	0.00	-1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	1.00	0.00	0.00	0.00
Mc (MSS/VLR_MGW)	c3.Tx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900MHz 2G spectrum fees	c4.Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1800MHz spectrum fees	c4.Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900MHz 3G spectrum fees	c4.Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2100MHz spectrum fees	c4.Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wholesale bi ling platform	c4.Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VMS	c4.Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Annex 4: Capex investment due to voice termination increment



Annex 5: Economic depreciation of voice increment

c2.9.1.depreciated cost of voice termination increment cost per unit of output

			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
	E01_001	Site	0.0109	0.0111	0.0113	0.0116	0.0118	0.0120	0.0123	0.0125	0.0128	0.0130	0.0133	0.0136	0.0138	0.0141	0.0144	0.0147	0.0150	0.0153	0.0156	0.0159	0.0162	0.0165	0.0169	0.0172	0.0175	0.0179	0.0182	0.0186	0.0190	0.0194
	E01_002	BTS	0.0776	0.0746	0.0718	0.0690	0.0663	0.0638	0.0613	0.0590	0.0567	0.0545	0.0524	0.0504	0.0485	0.0466	0.0448	0.0431	0.0414	0.0398	0.0383	0.0368	0.0354	0.0341	0.0327	0.0315	0.0303	0.0291	0.0280	0.0269	0.0259	0.0249
	E01_003	TRX	0.0271	0.0260	0.0250	0.0241	0.0231	0.0222	0.0214	0.0206	0.0198	0.0190	0.0183	0.0176	0.0169	0.0163	0.0156	0.0150	0.0145	0.0139	0.0134	0.0128	0.0124	0.0119	0.0114	0.0110	0.0106	0.0102	0.0098	0.0094	0.0090	0.0087
	E01_004	BSC	0.0085	0.0081	0.0078	0.0075	0.0072	0.0070	0.0067	0.0064	0.0062	0.0060	0.0057	0.0055	0.0053	0.0051	0.0049	0.0047	0.0045	0.0043	0.0042	0.0040	0.0039	0.0037	0.0036	0.0034	0.0033	0.0032	0.0031	0.0029	0.0028	0.0027
	E01_005	Node B	0.0082	0.0080	0.0078	0.0076	0.0074	0.0072	0.0070	0.0069	0.0067	0.0065	0.0064	0.0062	0.0061	0.0059	0.0058	0.0056	0.0055	0.0054	0.0052	0.0051	0.0050	0.0049	0.0047	0.0046	0.0045	0.0044	0.0043	0.0042	0.0041	0.0040
	E01_006	3G radio	0.1085	0.1043	0.1003	0.0965	0.0928	0.0892	0.0858	0.0825	0.0793	0.0762	0.0733	0.0705	0.0678	0.0652	0.0627	0.0603	0.0579	0.0557	0.0536	0.0515	0.0495	0.0476	0.0458	0.0440	0.0423	0.0407	0.0391	0.0376	0.0362	0.0348
	E01_007	RNC	0.0011	0.0011	0.0011	0.0010	0.0010	0.0010	0.0010	0.0009	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005
	E02_001	MSC-S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_002	GMSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_003	MGW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_004	HLR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_005	EIR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_006	AuC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_007	SMSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_008	MMSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_009	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_010	NMC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_011	Signa ling platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E02_012	Number portabil ty platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E03_001	Abis (BTS_BSC)	0.0135	0.0134	0.0133	0.0131	0.0130	0.0129	0.0127	0.0126	0.0125	0.0124	0.0122	0.0121	0.0120	0.0119	0.0118	0.0117	0.0115	0.0114	0.0113	0.0112	0.0111	0.0110	0.0109	0.0108	0.0107	0.0106	0.0104	0.0103	0.0102	0.0101
	E03_002	IuCS (RNC_MGW)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E03_003	IuCS (RNC_MSC/VLR)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E03_004	Iur (RNC_RNC)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E03_005	Iub (NB_RNC)	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0003	- 0.0002	- 0.0002	- 0.0002	- 0.0002
	E03_006	Nb (MGW_MGW)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E03_007	E (MSC/VLR_GMSC)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E03_008	A (BSC_MGW)	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	E03_009	Mc (MSS/VLR_MGW)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E04_002	900MHz 2G spectrum fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E04_003	1800MHz spectrum fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E04_004	900MHz 3G spectrum fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E04_005	2100MHz spectrum fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E04_006	Wholesale billing platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E04_007	VMS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 6

In the following table we review key points made in our submission of 2014 and ComReg's response to these points.

Vodafone Response to ComReg Consultation: Mobile Termination Rates: Draft Bottom Up Pure Long Run Incremental Cost Model - 2014

Key Points from Vodafone Submission 2014		Updated Comments
1	International practice is Model supported by the completion of a LRIC+ or LRAIC model in parallel with a LRIC model.	LRAIC+ supplied – but completely inadequate documentation supplied and values produced not in line with norms of LRIC/LRAIC+.
2	"One of the striking figures is the lack of an in depth sensitivity analysis which is considered good practice in any model of this complexity."	Not addressed - this remains a significant issue
3	ComReg has not checked	
	Historical WACC	Outstanding issue
	Historical spectrum allocation for 2G	Outstanding issue
Choice of Pure LRIC		
4	It is unreasonable that there has been no reconsideration or updating of the original theoretical decision on pure LRIC and/or validation against actual market information despite the fact that this decision was taken more than 19 months ago and in a rapidly changing market.	Not addressed. A quantitative analysis of the effect of an MTR rate of 2.6c should have been completed.
5	ComReg has outlined to Vodafone a Financial Impact Analysis of a pure LRIC rate of 0.57c but conducts no numeric analysis of consumer welfare benefit and does not appear to have used this Impact analysis in any consideration of the proportionality or otherwise of its proposed measure.	Not addressed
6	In other jurisdictions Pure LRIC has been justified by the assertion that common costs can be recovered elsewhere.	Not addressed
Procedural Issues- Failure to use additional market information		
7	ComReg has failed to make any examination of the extent of any pass through to fixed retail customers of these reductions. ComReg has not carried out any assessment of the level of pass through based on a stable symmetric MTR of 2.60c. Nor has it carried out any sensitivity analysis to determine if further reductions would lead to the same level of pass through.	Not addressed
8	A second justification proposed by ComReg in its original decision for the choice of pure LRIC is that higher MTRs in some way discriminate against smaller mobile operators - ComReg has not assessed if there is effective competition at an MTR rate of 2.60c.	Not addressed. Significant change has happened in the market because of the merger of O2 and 3. The commitments made by 3 to the EU Competition Authority to support the establishment of 2 new MVNOs on defined terms and the effect of the merger have not been examined.
9	In order to ensure that a price control obligation based on pure LRIC is proportionate ComReg must assess the extent to which any common costs which otherwise would have been recovered as part of MTR charges absent a pure LRIC price control can actually be recovered from the rest of Vodafone's business.	Not addressed

Consultation Process		
10	ComReg has taken real operator data and synthesised the model inputs for a hypothetically efficient operator. While ComReg has provided a copy of the model and an associated "design" document the level of detail in which these set out the methodology by which the operator data has been used is simply not sufficient to allow an intelligent review and comment on the methodology used.	Not adequately addressed
11	Notwithstanding the additional time given to interested parties to formulate a response, it has become apparent to Vodafone in conducting its review that the time given to respond to the model was not adequate given the very complicated format of the spreadsheets and the sparse documentation of variable and calculations. This situation is exacerbated by ComReg's failure to properly annotate the model itself in spite of Vodafone requesting that this be done.	Issue of annotation of the model is still outstanding.
12	ComReg may argue that it can adjust for such unexpected results however simply ignoring these or manually inserting sensible values, does not address the fundamental issue that the model algorithm produces such nonsense results in the first place. That it can be identified that the model deviates so starkly from reality in these cases means that a serious question arises as to whether the model also has similar deviations in those cases which are more difficult to verify.	Not addressed
Consultation Questions		
Q. 1 Do you agree with ComReg"s preliminary views regarding the appropriateness of the operator parameters and their application in the Draft BU Pure LRIC Model? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence supporting your views.		
	Form of the modelled operator	
13	On this basis a correctly constructed model based on the hypothetically efficient existing operator and an actual operator at a given market share should be strongly aligned.	Not addressed - a robust top-down calibration has not been completed.
	Top Down Analysis	
15	In Vodafone's view there are a number of assumptions contained in the model which individually and/or cumulatively produce an unrealistic figure for the termination increment. In addition, there are significant simplifications in the network model, which make comparison with real model figures difficult.	Not addressed.
16	In line with the text of the Termination Recommendation ComReg should carry out a reconciliation of the results of a bottom-up model with the results of a top-down model in order to produce as robust results as possible. 3.32 There is an associated risk however that some of the assumptions adopted in a BU model may prove to be unrealistic for an actual operator to achieve. For this reason, the 2009 Termination Rate Recommendation notes that: "*Given the fact that a bottom-up model is based largely on derived data.., regulators may wish to reconcile the results of a bottom-up model with the results of a top-down model in order to produce as robust results as possible and to avoid large discrepancies in operating cost, capital allocation between a hypothetical and a real operator."*[37]	Not addressed

17	The calibration referenced in paragraph 3.34 of the consultation document is limited and is flawed as the maximum and minimum range which is used for comparison includes those operators who use National Roaming and/or are 3G only. Vodafone notes that while ComReg's consultants compare the number of modelled TRXs to the number of TRXs actually deployed by operators this second figure was not directly asked for in the data gathering carried out by ComReg and must have been derived or imputed from some other source.	Not addressed
18	In respect of the assumed or modelled inputs, ComReg has not checked that the historical WACC, used as a model input, reflects its own historical estimation of the WACC for the Irish market, nor that it reflects the WACC that ComReg included in the Mobile Licenses of Operators. ComReg has not checked that the assumed historical spectrum allocation for 2G reflects the actual amount of spectrum that ComReg made available in the market. In terms of the proportion of traffic types ComReg has not compared the derived fixed to mobile and mobile to fixed traffic ratios with the information ComReg publishes on a quarterly basis.	Not addressed
19	In respect of the outputs, there does not appear to be any attempted comparison between the number of sites that the model predicts for a certain aggregated volume of traffic and the actual number of sites deployed by operators for that same volume. If there was a difference this would require explanation as being related primarily to efficiency issues before the model output could be relied upon.	Not addressed
20	Furthermore given the hypothetical nature of the model produced a financial calibration, it should have been carried out using real financial data obtained from operators. To assist this Vodafone submitted extensive financial data as part of the data gathering exercise. No reference has been made to a suitable financial calibration.	Not adequately addressed. The short comparison to Meteor figures is not adequate.
	Market Share	
21	The recent notification of the O2/3 merger approval indicates that as part of the remedies some reservation of network capacity and or spectrum must be made by the merged entity to support new entrants. Clearly this implies that in the context of the Irish market a generic hypothetical infrastructure operator will have less than 33% market share for its own traffic. It may have as low as 25%. In this context and taking account of the ComReg commentary on the merger approval notification Vodafone believes that it would be unsafe and disproportionate to assume a modelled market share higher than 25% at this time. . . . This reinforces Vodafone's view that any change to the proposed 25% market share proposed to be used in the model would require a substantive consultation in its own right.	Not addressed.
Q. 2 Do you agree with ComReg"s preliminary views regarding the appropriateness of the service parameters and their application in the Draft BU Pure LRIC Model? Please provide reasons for your response clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence supporting your views		
	2G Busy hour traffic	
22	The calculation of busy hour traffic is not producing traffic figures consistent with actual network traffic.	

	Calculation using working days produces a 2G traffic in BH of 10,618 in 2011. Vodafone's 2G BH traffic at this time was more than [redacted] Erl. Taking this as the traffic for a 40% market share we would expect the HEO with 25% market share to have a busy hour traffic of approximately [redacted] ERL. While we understand that a there will be variation between the HEO and actual traffic experienced by an operator this variation appears outside reasonable variation.	Not adequately addressed. Although a small change was made model outputs are still far from real network data.
	Busy hour calculations	
Q. 3 Do you agree with ComReg's preliminary views regarding the appropriateness of the technological parameters and the network structure (including network design parameters and dimensioning rules) used to model the hypothetical efficient operator's mobile network? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence supporting your views.		
	Treatment of Spectrum	
23	Vodafone notes that the proposed treatment of 900MHz spectrum is not consistent with the approach set out in paragraph 3.138 of the consultation document.	Not addressed
24	Firstly, the amount of 900MHz spectrum available to each of the GSM operators from 2003 to 2013 was 7200kHz. This should be reflected in the model. There was no process available for operators to obtain an increase in spectrum before the spectrum auction of 2012 and a Modelled Operator had no opportunity to have more spectrum. This actual market condition must be reflected in the model.	Not addressed.
	Geographic traffic profile	
25	The 2G/3G proportion of traffic in rural areas is the same as in urban and suburban areas. This is not a reasonable assumption as propagation at 2100MHz, the frequency used by 3G, is limited in rural areas. The proportion of traffic carried in rural areas is then significantly less than urban and suburban areas. In Vodafone's data submission we presented figures showing a lower rural traffic proportion, e.g. 75% of traffic on 2G in 2010.	Significant change has been made to the urban/rural split in the model. This has not addressed the issues raised. Additional work need to be done to fix this issue.
	Reference: Load > D1 demand	
	Re-use Factor	
26	The model uses a re-use factor of 10. We believe that in order to provide a reasonable quality service to customers a re-use factor of 12 should be used. This factor has been widely applied in other European models and used, for instance, by regulators in Portugal, Romania or the UK. In Ireland, we have had particular problems in obtaining access to sites to use for base station locations. Because of this we have had to use sub-optimal locations, making frequency planning more difficult and making it more important to avoid interference. Hence using larger re-use factors than would be needed in cities where optimum locations are available.	Not addressed
	Busy Hour	
27	In relation to ComReg's response of 30 June 2014 to the issue of TRX rounding ComReg sets out that the use of such uplift factors is one of the justifications for the use of averaged and	Not addressed. A change has been made in the model to round fractions between 0 and 1 upwards but does not round

	non-integer number of TRXs. In fact it is because the uplift factor is required to deal with localised per cell peak traffic demand effects that such network wide averaging is entirely inappropriate and integer numbers of TRXs must be used.	up the fractional numbers above 1.
	Conversion factors	
28	As stated in the consultation document as well as the model specification, the conversion in the model is based on Erlang based busy hour calculations. The model, however, constructs conversion in a way that is linked to Mbit/s. Basic sensitivity tests of the nominal full rate bit rate in the busy hour show that increasing the data rate for voice produces a lower rate.	Not addressed.
29	Vodafone continues to believe that this approach is flawed as the conversion factor for voice demand bears no relationship to the network impact of a given data load. This is particularly so in the context of 2G where the data load will be low volumes of GPRS traffic.	
	Treatment of voice to data conversion	
30	ComReg has set out that it accepted Vodafone's position that the impact on the network of data carrying real time services such as voice is higher than general data usage and stated that this had been accommodated. However no details have been given on how this is done and it is impossible for respondents to comment on whether this issue has been adequately reflected in the model. (See paragraph 3.164 of the consultation document) Given the material deficiencies identified by Vodafone in those model parameters which can be validated and this lack of transparency, the inability to validate ComReg's approach in respect of this matter raises a material procedural concern.	Not addressed.
	Logical structure of modelled network	
31	The Consultation sets out a high level network topology. The functional blocks within this topology are aggregations of specific network implementations. The level of aggregation and the lack of granular description of cost allocation mean that it is not possible to properly assess whether the approach and costing adopted by ComReg are reasonable or realistic.	Not addressed
32	Within the last three years transmission elements have absorbed more than [redacted] of Vodafone's network budget. We do not see that this is reflected in the outputs of the model. In addition the lack of detail and description provided does not allow Vodafone to assess where the discrepancy has been created.	Not addressed.

Q. 4 Do you agree with ComReg's preliminary views regarding the appropriateness of the network element costs used to cost the

hypothetical efficient operator's mobile network? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence supporting your views.		
	<u>Appropriateness of network element costs: Share of NMC and MSC costs.</u>	
33	It appears the model does not take into account any MSC or NMC costs. These costs constitute a very significant contribution to the overall costs of building and operating a network. Management of data parameters for sites and transmission elements constitutes a significant part of these costs. These costs will scale with size of network and thus a portion of the costs should be attributable to the incremental cost of termination	Not addressed.
	<u>Completeness of costs accounted for in the model</u>	
34	We have in answer to Question 3 stated that the Network Model is an over simplification of a real network, and previously supplied details of our actual spend on MPLS as a sample of spend which is not covered by elements used by ComReg. There should be a top down calibration of the costs produced by the model against real costs experienced by operators. Although the model specification document refers to such a check no factual evidence has been provided for operators to assess the appropriateness of the assumed cost split. Once again given the deficiencies identified in those parameters which can be validated this lack of transparency and inability to review and comment is a significant procedural concern.	Not addressed
Q. 5 Do you agree with ComReg's preliminary views regarding the appropriate implementation approach in the Draft BU Pure LRIC Model? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant supporting factual evidence.		
	<u>Consistency and sensitivity checks</u>	
35	Although the consultation document pinpoints that there have been sensitivity and sanity checks the review of the actual model illustrates clear deficiencies.	Not addressed
36	Vodafone has highlighted this issue with regards to e.g. the incoming/outgoing traffic patterns as well as the rounding issues of TRXs. Vodafone's review revealed further discrepancies. These are summarised below. This list, however, is not deemed to be exhaustive.	Not addressed
37	ComReg uses carrier capability to calculate user throughputs (c.1 Ran calculations). However, that does not reconcile with reality. Whereas ComReg asserts that 3G carriers are capable of 100% of potential user throughput, in reality practical limits of 50% to 70% apply. Once again given the deficiencies identified in those parameters which can be validated, this lack of transparency and inability to review and comment is a significant procedural concern.	Not addressed
38	Vodafone asserts that the response given by ComReg with regards to collocation is insufficient. ComReg hasn't explained why the percentage of 2G 1800 MHz collocation is so different to the number of 1800 MHz equipped sites. The numbers of sites calculated to have 900 MHz and 1800 MHz do not calibrate against Vodafone's network data.	Not addressed

39	The 900 MHz effective voice traffic per cell (c1. Ran, row 116, 117, 118) calculated by the model is significantly higher in rural compared to urban areas. This does not seem to calibrate with expected Voice traffic patterns Vodafone's experiences where urban traffic per site is much higher than in rural areas.	Not addressed
	<u>WACC consideration</u>	
40	The current draft model considers a constant nominal pre-tax WACC of 8.66%. ComReg set out in Vodafone's 3G licence that the appropriate WACC to apply for the period 2003 to 2008 was 18%.	Not addressed

Annex 7: Model sensitivity analysis on selected items

Proposed model change	Change in model results
Adjusted spectrum allocations in line with actual historical levels (see p. 11 in the main body of Vodafone's response)	Pure LRIC Nominal value changes from 0.0071 to 0.0077, which equals a 8% change in the overall rate LRAIC+ Nominal value changes from 0.0098 to 0.0100, which equals a 2% change in the overall rate
Adjusted spectrum re-use factor to 12	Pure LRIC Nominal value changes from 0.0071 to 0.0085, which equals a 16% change in the overall rate LRAIC+ Nominal value changes from 0.0098 to 0.0107, which equals a 8% change in the overall rate
Adjusted WACC In line with historical values (replacing constant WACC with 18.63% up to 2008).	Pure LRIC Nominal value changes from 0.0071 to 0.0082, which equals a 13% change in the overall rate. LRAIC+ Nominal value changes from 0.0098 to 0.0113, which equals a 13% change in the overall rate.
Land area adjustments	Will change overall weight of geographies with different network dimension requirements due to each specific geography this can significantly change the overall results both for the coverage and capacity network.
Conversion factor	Leads to unexpected effects as outlined in the main body of the response. Requires revision of current model.
Small changes in CAPEX unit element requirements	We changed the overall sites to 100.000, which led to a ~ 3% changes both in the nominal Pure LRIC and LRAIC+ values.
Cumulative effect of changes in spectrum allocation, spectrum re-use factor and adjusted WACC as outlined above.	Pure LRIC Nominal value changes from 0.0071 to 0.0106, which equals a 33% change in the overall rate LRAIC+ Nominal value changes from 0.0098 to 0.0127, which equals a 22% change in the overall rate

Commission for
Communications Regulation

16 November 2015

Gary Healy
Head of External Affairs & Regulation
Vodafone Ireland Limited
MountainView
Leopardstown
Dublin 18

Mobile Termination Rates Model

Dear Gary

I refer to your letter of 28 September 2015 (the "September Letter"), and to the letter from Ray Collins of Vodafone Ireland Limited of 7 May 2015 (enclosing Vodafone's response to ComReg's Supplementary Consultation on the Mobile Termination Rates Draft Bottom Up Pure Long Run Incremental Cost Model ("BU Pure LRIC Model"), ComReg Document 15/19 (the "Supplementary Consultation")) (the "May Letter"). I also refer further below to your letter of 12 November 2015 (the "November Letter") in relation to ComReg's notification letter of 29 July 2015 to the European Commission requesting an extension of the period for conducting an analysis of the market.

ComReg notes Vodafone's views, as set out in the May Letter and the September Letter, that a further public consultation or similar should be carried out by ComReg in advance of the submission of a notification under Article 7 of the Framework Directive[1] and/or the finalisation of ComReg's decision on the BU Pure LRIC Model (the "Final BU Pure LRIC Model" and "Final Response to Consultation and Decision").

ComReg is satisfied that this is not necessary in light of the extensive consultation undertaken to date (in particular via ComReg Consultation on the Mobile Termination Rates Draft Bottom Up Pure Long Run Incremental Cost Model, ComReg Document 14/29 (the "Original Consultation") and the Supplementary Consultation)[2], the views of its consultants and ComReg's own extensive analysis. ComReg considers that this approach is fully in compliance with its regulatory obligations.

On a related but separate point, your September Letter appears to suggest that ComReg indicated to Vodafone that the draft BU Pure LRIC Model was in some way "erroneous" in a material sense. Please be advised that that such a suggestion to the extent that it is in fact made is rejected entirely.

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[1] Notification to the European Commission , the Body of European Regulators for Electronic Communications (BEREC) and other National Regulatory Authorities (NRAs) in other Member States of draft measures under Article 7 of Directive 2002/21/EC as amended by Directive 2009/140/EC (the "Framework Directive").

[2] Including an industry workshop on 20 January 2014 to which all Mobile Service Providers ("MSPs") designated with Significant Market Power ("SMP") in the Mobile Voice Call Termination ("MVCT") markets were invited and a bilateral workshop held with Vodafone on the same date.

ComReg also notes Vodafone's comments in the September Letter regarding LRAIC+ rates moving towards or below Pure LRIC levels in the context of the model. This issue, and all other operator responses to the Original Consultation and the Supplementary Consultation, will be addressed in full in the Final Response to Consultation and Decision. For the avoidance of doubt, please note that it is ComReg's standard practice to address issues raised in consultations in its final response to consultation and decision.

ComReg thus intends to submit the Article 7 of the Framework Directive notification to the European Commission shortly. We would be grateful if Vodafone could confirm by no later than 12pm on Friday 20 November that the September Letter and the November Letter[3] are not confidential and may be published in their entirety as part of that Article 7 notification (or, if not, to identify relevant confidential passages). If we do not hear from you we will assume that this is in order.

We also note Vodafone's query in the May Letter regarding the timing of the Final Response to Consultation and Decision and whether ComReg will make an application to the High Court concerning the setting of MTRs pursuant to the Final BU Pure LRIC Model. Subject to the receipt and consideration of any comments under Article 7(3) of the Framework Directive (and assuming no notification from the European Commission under Article 7a is forthcoming) ComReg intends to proceed to the Final Response to Consultation and Decision as soon as possible after the one month deadline for comments as set out in Article 7(3) has passed. Prior to adopting the Final Response to Consultation and Decision, ComReg intends to inform the High Court of its intention to do so. In this regard and in the context of the extant appeal proceedings taken by Vodafone (High Court Record No. 2012/465MCA), please note that ComReg's solicitors will shortly be writing to Vodafone's solicitors in relation to so informing the High Court.

Finally, please be advised that ComReg will be inviting all MSPs designated with SMP in the MVCT markets to bilateral workshops in respect of the BU Pure LRIC model before the publication of the Final Response to Consultation and Decision and we look forward to Vodafone's participation.

With reference to the November Letter, the contents of which are noted, please be advised that ComReg's request for a two year extension to the period for carrying out any further analysis of the relevant market involved was not objected to by the European Commission and has thereby been granted by the European Commission. The basis for ComReg's request for this extension is set out in detail in its notification letter of 29 July 2015 and ComReg does not consider that the matters raised in the November Letter are such as to call into question the status of, or the validity of the analysis in, the underlying MVCT market review decision (Decision D12/12) or any other aspect of the Final Response to Consultation and Decision.

In relation to the penultimate and last paragraphs of the November Letter, as set out further above, all material issues raised by Vodafone (and other operators) to the Original Consultation and the Supplementary Consultation, will be addressed in full in the Final Response to Consultation and Decision.

Yours sincerely

Donal Leavy

Director Wholesale Division, ComReg

[3] ComReg notes that Vodafone has previously confirmed that the May letter may be published.

12 November 2015

Mr Donal Leavy,
ComReg,
Irish Life Centre
Abbey St,
Dublin 1.

Dear Donal,

Re: ComReg Letter to Mr Reinald Krueger, DG Communication Networks, European Commission re delay to Market Review.

We note with interest the notification by ComReg and request for a 'reasoned proposed extension of the period for conducting an analysis of a market pursuant to Article 16(6)(a) of the Framework Directive Market 7 (in the terminology of the 2007 Commission Recommendation): Market 2 (in the terminology of the 2014 Commission Recommendation) Wholesale Voice call termination on individual mobile networks'

We have only just been made aware of the proposed extension and we have grave concerns that if this extension is granted it will undermine the intention of the directives to place a time a period on regulators to conduct market reviews. We have also serious concerns about the implications for any proposed Price Order in the Mobile Termination Market.

ComReg state in their letter that they believe that the absence of a market review would not compromise the implementation of Pure LRIC rates in the Irish market. We do not see how this can be as a Market Review should be the basis for proposing a Price Control Decision.

The Market Analysis is out of date

The Relevant Market has changed significantly since the last analysis was completed. As an example of the major change two new MVNOs have been created and there has been a significant consolidation in the market with the market now 3 network operators not 4. The new MVNOs do not have SMP and one of them is not applying the court appointed rate. This creates an uncertainty in the market which requires an updated market review urgently

Another example of significant change is the rise in OTT services. In your letter to the EC ComReg talk about " an intrinsic bottleneck" in the termination market. But users now have

access to many OTT services which can enable users to reach their intended contact using all or any of voice, pictures and text carried on data channels. The terminating subscribers are paying for their own data use, typically from their large data bundles - in contrast to circuit switched voice where the calling party pays. Where these services are used inter-network there is no charge to the originating network. These services were not generally available in 2011 when data for the current Market review was gathered.

Given the change in market circumstances in Ireland we do not accept that ComReg can reasonably state with confidence that there is now a market failure that needs addressing. Furthermore ComReg cannot now say that an extreme cost measure such as LRIC, is needed to solve any market failure. ComReg's proposed implementation of the Pure LRIC rates will in fact be compromised by the non-completion of a new Market Analysis..

ComReg could have reasonably produced a Market Analysis.

In explaining the delay in producing a Market Analysis Comreg state that circumstances listed are "wholly exceptional and non-systematic", but the High court judgment against ComReg was issued in August 2013, more than enough time has elapsed to allow ComReg to carry out the market review.

In light of the decision of the Irish High Court removing ComReg's last price control order ComReg should have taken the utmost care in applying another price control. Not only has no market review been but it is clear from your letter that no steps have been taken to begin the process.

ComReg have still not produced a LRIC model.

In our response to ComReg's MTR consultations this year significant issues were raised – we have not been assured that these issues have been addressed by ComReg and the necessary corrections have been taken on board. We do not consider this consultation has been completed.

ComReg have not taken the reasonable measure of care to check the output – a comparison of top-down costs with the model output. This step has been completed in other jurisdictions and could be completed here.

The Way forward.

We would restate the view of the Irish High Court when it concluded that the 2009 Termination Rates Recommendation does not of itself confer any power on either the EC or ComReg to impose a price control.

Vodafone now request ComReg to complete a market analysis and re-consult on the appropriateness of the price model proposed,

ComReg should separately complete the LRIC model consultation. We need to be assured that the errors we identified previously are corrected. A top-down comparison with Vodafone's actual costs is required.

We would welcome your views on the implications of a delay in completing a market analysis especially considering the existing market analysis and the basis of SMP obligations is based on data collected in 2011.

Yours sincerely

Gary Healy
Head of External Affairs & Regulation
Vodafone Ireland Limited

Donal Leavy
Director Market Operations
ComReg
Abbey Mall
Lr Abbey Street
Dublin 1

28th September 2015

Mobile Termination model

Dear Donal,

We are writing in connection with ComReg's mobile termination cost model. Vodafone notes with concern that ComReg's intention is to notify the European Commission under the Article 7 procedure and subsequently enact a revised mobile termination regime in Ireland without sharing with industry the final model and the assumptions underpinning the methodology.

While ComReg assures Vodafone that the erroneous model has been revised and all issues raised by stakeholders in previous consultations have been addressed, Vodafone is alarmed by the lack of transparency given the materiality of matters highlighted which question the integrity, robustness and general accuracy of the model developed by ComReg's consultants.

In particular, ComReg has not addressed the incoherence of calculated "LRAIC+" rates
that appear to gradually move towards or even below "Pure LRIC" levels. Vodafone is not aware of any European precedent[1] of a "Pure LRIC" rate moving below levels of a "LRAIC+" rate and would at the very least require a detailed explanation of ComReg's consultants on this irregularity.

[1] OFCOM's modelled rates http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-call-termination-14/statement/Annexes_7-13.pdf illustrate that a shift of data patterns does not profoundly alter the relation between "Pure LRIC" and "LRAIC+" levels as asserted by ComReg.

Further and as outlined in our consultation response, previous changes made to the model appear to be arbitrary and inconsistent calling into question the objectivity and reliability of the model as such. Therefore, Vodafone urges ComReg to fulfil its regulatory obligations and address any outstanding concerns and changes to the model by means of a transparent, public consultation of all stakeholders.

Vodafone maintains the objections set out in the part-determined High Court appeal bearing record no. 2012/465MCA which remain pending before the High Court against ComReg's choice of "Pure LRIC" as an appropriate cost control methodology for the Irish market.

Considering the lack of transparency on the revised model, which ultimately forms the basis for ComReg's price control Vodafone asserts that the legal conditions for the imposition of a price control have still not been met by ComReg.

We thus encourage ComReg to address our outstanding concerns in a public consultation before moving to the finalisation of the price control or to host an industry workshop dealing with the revised model before ComReg's intended submission under the Article 7 procedure. Vodafone would also request a meeting the ComReg team to discuss the changes ComReg propose before finalising the notification.

Yours Faithfully.

Gary Healy

Head of External Affairs & Regulation

Ms Claire Kelly
Commission for Communications Regulation
Irish Life Centre,
Abbey St
Dublin 1

CC: Mr Donal Leavy
Director of Finance and Wholesale

Dear Sir

Vodafone Response to ComReg's Supplementary Consultation 15/19

Please find attached Vodafone's response to ComReg's supplementary consultation: Mobile Termination Rates: draft bottom up pure long run incremental cost model (ComReg 15/19).

As appears from the legal disclaimer included in Vodafone's response, Vodafone maintains the objections it set out against ComReg's choice of Pure LRIC as the cost methodology in its appeal (High Court 2012 No. 465MCA) against ComReg decision D12/12 of 21 November 2012 (included in ComReg 12/125). That part of Vodafone's 2012 appeal which concerns the choice of Pure LRIC remains pending before the High Court and Vodafone's response to the supplementary consultation is strictly without prejudice to those objections and to the determination of that appeal.

Having regard to the requirements of the European Communities (Electronic Communications Networks and Services)(Access) Regulations 2011 (SI No. 334 of 2011) and in particular Regulations 8 and 13, Vodafone believes that the legal conditions for the imposition of a price control have still not been met by ComReg.

As is apparent from the substantive part of Vodafone's consultation response, Vodafone does not believe that sufficient analysis has been undertaken of the circumstances of the Irish market following the merger of H3GI and O2 so as to permit a proper definition of the characteristics of the hypothetical efficient operator.

In addition, Vodafone is extremely concerned that a large number of issues that it identified with the current Deloitte model (and which impact significantly on the model's outputs) have not been addressed and that further new issues have arisen with the model, as outlined in our consultation. Vodafone believes that in these circumstances, the draft model included in the supplementary consultation is not fit for purpose to calculate objectively and with reasonable accuracy what the Pure LRIC MTR for the hypothetical efficient operator in Ireland would be.

In these circumstances, Vodafone believes that a further consultation must be undertaken on the proper definition of the hypothetical efficient operator in the current circumstances of the Irish market. This further consultation must also address the number of inaccuracies identified in the Deloitte report.

This is vital to ensure that all elements of the model are properly considered and tested, having regard to the significance of the impacts which the ultimate decision will have. Should ComReg fail to do so, Vodafone reserves its position to take appropriate legal action including if necessary, a Judicial Review of the procedure to date if the proposed new rates are introduced on the basis of the existing flawed consultation procedure. For the avoidance of doubt, Vodafone would deem a notification under the Article 7[1] procedure as a ComReg notification to move to the final stages of a decision without a further consultation

Separately, and without prejudice to the foregoing, Vodafone requires clarity around the intended timing of the ultimate decision and its interaction with the existing order of the High Court affecting Vodafone's MTRs. Vodafone is conscious that its current MTRs are set by order of the High Court in the proceedings mentioned above, which is currently the subject of an appeal by ComReg to the Court of Appeal. ComReg might please clarify whether, when the consultation process moves to a stage where a final decision is considered imminent, it intends to apply to court for any further order concerning the setting of MTRs. Naturally, any such application would have to be on notice to Vodafone as the other party to the proceedings in which the order concerned was made.

Yours sincerely

Ray Collins

Head of Strategy

Vodafone Ireland Limited.

[1] Article 7 of Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive), OJ L 108, 24.4.2002, p. 33, as amended by Directive 2009/140/EC, OJ L 337, 18.12.2009, p. 37, and Regulation (EC) No 544/2009, OJ L 167, 29.6.2009, p. 12.