



An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Decision

Price Control Obligations for Fixed and Mobile Call Termination Rates

NON-CONFIDENTIAL

Response to Consultation and Decision

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Chapter 1

1 Introduction

- 1.1 The Commission for Communications Regulation (**ComReg**) is the National Regulatory Authority (**NRA**) responsible for the regulation of the electronic communications sector (telecommunications, radio communications, broadcasting transmission and premium rate services) and the postal sector.
- 1.2 In October 2017, ComReg published a market review consultation¹ (the '**Market Review Consultation**') on its analysis of the wholesale markets for the provision of fixed voice call termination (**FVCT**) and mobile voice call termination (**MVCT**). The purpose of the Market Review Consultation was to determine whether such markets were effectively competitive and, if not, what specific regulatory obligations should be imposed. The Market Review Consultation proposed a number of obligations in the FVCT and MVCT markets including a price control obligation of cost orientation.

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¹ ComReg Document 17/90r*, "Market Review – Fixed Voice Call Termination and Mobile Voice Call Termination", Consultation and Draft Decisions, 2 November 2017.
<https://www.comreg.ie/media/2018/01/ComReg1790r.pdf>

- 1.3 In light of the proposed price control obligation of cost orientation, ComReg in March 2018 issued a separate Consultation and Draft Decisions document (the '**Consultation**'²) which set out the detailed nature and implementation of the price control obligations which ComReg proposed to impose on service providers ('**Service Providers**') found to have Significant Market Power ('**SMP**') in FVCT/MVCT markets as a result of the Market Review Consultation and any subsequent decision. Service Providers of fixed and mobile telephony in Ireland connect calls to and from their subscribers. They charge their subscribers at a retail level for calls made to other subscribers on their network and to subscribers on other networks. They also charge other Service Providers at a wholesale level for connecting incoming calls to their subscribers. These wholesale charges are called fixed termination rates ('**FTRs**') and mobile termination rates ('**MTRs**') depending on whether the subscribers being called are on fixed or mobile networks. In this Response to Consultation and Decision document (the '**Decision**'), where appropriate, FTRs and MTRs are collectively referred to as '**Termination Rates**'. As part of the Consultation, ComReg also published an FTR cost model specification document ('**FTR Consultation Specification Document**'³) and an MTR cost model specification document ('**MTR Consultation Specification Document**'⁴) that provided details of the cost models used to determine Termination Rates.

² ComReg document No 18/19 "Price Consultation Further Specification of Proposed Price Control Obligations for Fixed and Mobile Call Termination Rates" 13 March 2018.

<https://www.comreg.ie/media/2018/03/ComReg1819.pdf>

³ ComReg document 18/19b, TERA Report 'Assessment of Pure LRIC FTRs in Ireland – Specification and results'. <https://www.comreg.ie/media/2018/05/ComReg1819b.pdf>

⁴ ComReg document 18/19c, AM Report 'Specification for the proposed new MTR model'.

https://www.comreg.ie/media/dlm_uploads/2018/03/ComReg1819c.pdf

- 1.4 ComReg previously consulted on FTRs and MTRs in 2012⁵ (the ‘**2012 Pricing Consultation**’) and thereafter issued the 2012 Pricing Decision (the ‘**2012 Pricing Decision**’)⁶. In that Decision ComReg determined that Termination Rates were to be based on pure long run incremental cost⁷ (‘**LRIC**’) developed on a bottom up (‘**BU**’) basis (consistent with the European Commission’s recommended practice), this approach being known as “BU pure LRIC”. Specifically, in regard to recommended practice, the European Commission in 2009 issued a recommendation, *The Regulatory Treatment of Fixed and Mobile Termination Rates in the EU*⁸ (the ‘**2009 Termination Rates Recommendation**’) in which it recommended that Termination Rates be based on a BU pure LRIC methodology.
- 1.5 In the 2012 Pricing Decision, maximum regulated FTRs were determined by means of a BU pure LRIC model⁹. MTRs were, in the absence of the requisite cost model at that time, to be based on a benchmark derived from MTRs in EU Member States in which NRAs had already adopted BU pure LRIC models. However following an appeal by Vodafone Ireland Limited (‘**Vodafone**’) against elements of 2012 Pricing Decision, the High Court found that the benchmarking approach adopted by ComReg in this instance (and recommended by the European Commission) for setting MTRs was outside the scope of what was provided for in the relevant EU and Irish legislation. As a result, any obligation arising from benchmarked MTRs derived from EU Member States sought to be imposed under the 2012 Pricing Decision was set aside by the Court.

⁵ ComReg Document 12/67, “Voice Termination Rates in Ireland – Proposed Price Control for Fixed and Mobile Termination Rates”, Consultation and Draft Decisions, 28 June 2012, (the ‘**2012 Pricing Consultation**’), <https://www.comreg.ie/csv/downloads/ComReg1267.pdf>

⁶ ComReg Decision D12/12, Document 12/125, “Mobile and Fixed Voice Call Termination Rates in Ireland”, 21 November 2012, (the ‘**2012 Pricing Decision**’), <https://www.comreg.ie/csv/downloads/ComReg12125.pdf>

⁷ The approach favoured by the European Commission is referred to as a “**pure LRIC**” approach i.e. it includes all fixed and variable costs associated with the provision of the wholesale termination service and excludes common costs that would be incurred regardless of whether this service is provided or not.

⁸ European Commission Recommendation: “*The Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC)*”; dated 7 May 2009.

⁹ Section 4.2 of this Decision provides an explanation of BU incremental cost models.

- 1.6 Subsequently, ComReg further consulted on proposed regulated maximum MTRs using a BU pure LRIC model in 2014¹⁰ and 2015¹¹. A final decision on regulated maximum MTRs was issued in February 2016¹² (the '**2016 MTR Pricing Decision**'), based on a BU pure LRIC model.
- 1.7 The BU pure LRIC models that were built to set the regulated maximum FTRs (in the 2012 Pricing Decision) and MTRs (in the 2016 MTR Pricing Decision) used network traffic levels and forecasts, equipment costs, and technology available at those times as inputs for the models. Over time network usage and equipment costs can change e.g. data volumes have grown substantially compared to voice in recent years. There has also been technological change e.g. the use of 4G in mobile networks for faster data transmission. ComReg, with its consultants Analysys Mason Limited ('**AM**') and TERA Consultants ('**TERA**'), updated the MTR and FTR cost models for determining the maximum regulated Termination Rates as part of the consultation process for this Decision. ComReg used information provided by Service Providers for the purpose of ComReg's Quarterly Key Data Report¹³ ('**QKDR**'). ComReg also obtained additional up-to-date data on costs, network traffic levels and forecasts from Fixed Service Providers ('**FSPs**') and Mobile Service Providers ('**MSPs**') through detailed Statutory Information Requests¹⁴ ('**SIRs**'). Thus the updated BU pure LRIC models used in the Consultation took into account changes in technology and usage since the previous consultations and decisions.

¹⁰ ComReg Document 14/29, "Mobile Termination Rates: Draft Bottom Up Pure Long Run Incremental Cost Model", Consultation and Draft Decision, 11 April 2014, <https://www.comreg.ie/csv/downloads/ComReg1429.pdf>

¹¹ ComReg Document 15/19, "Mobile Termination Rates: Draft Bottom Up Pure Long Run Incremental Cost Model", Supplementary Consultation, 26 February 2015, <https://www.comreg.ie/csv/downloads/ComReg1519.pdf>

¹² ComReg Decision D02/16, Document 16/09, "Mobile Termination Rates: Response to Consultation 14/29 and Supplementary Consultation 15/19 and Decision Document", 12 February 2016, (the '**2016 MTR Pricing Decision**'), <https://www.comreg.ie/csv/downloads/ComReg1609.pdf>

¹³ QKDRs may be found at: <https://www.comreg.ie/industry/electronic-communications/market-information/quarterly-key-data-report/>

¹⁴ ComReg may issue information requests to Service Providers pursuant to its powers under section 13D(1) of the Communications Regulation Act 2002 (as amended).

- 1.8 The Response to Consultation and Decision¹⁵ for the Market Review of Fixed Voice Call Termination and Mobile Voice Call Termination (the '**Market Review Decision**'), issued together with this Decision, considers the views of respondents to the Market Review Consultation. The Market Review Decision sets out ComReg's final position regarding its review of competition within the wholesale markets for FVCT and MVCT and sets out in Section 8 the obligations to be imposed on FSPs and MSPs designated with SMP. It was decided in the Market Review Decision that a price control obligation of cost orientation would be imposed on all FSPs and MSPs designated with SMP in FVCT/MVCT, with the detailed specification of that cost orientation obligation being determined through this Decision.
- 1.9 In light of the Market Review Decision, this Decision sets out ComReg's final position of the nature and implementation of the price control obligation of cost orientation having considered the submissions received to the Consultation ('**the Submissions**').
- 1.10 Submissions¹⁶ to the Consultation were received from the following four Service Providers ('**Respondents**'):
- Eircom Limited;
 - Tesco Mobile Ireland Limited;
 - Verizon Ireland Limited; and
 - Vodafone Ireland Limited.
- 1.11 This Decision also takes into account the comments received from the European Commission following on from the Article 7 notification of the draft Decision¹⁷.

Structure of this Decision Document

- 1.12 The key issues and ComReg's final positions are set out in a similar structure to the Consultation.

¹⁵ ComReg document 19/47 D10/19, "Market Review – Fixed Voice Call Termination and Mobile Voice Call Termination", Response to Consultation and Decision, 23 May 2019.

¹⁶ ComReg document 19/48s, 'Submissions to Termination Rates Consultation', 23 May 2019.

¹⁷ The draft Decision Document (including all appendices and annexes thereto) was notified on 11 March 2019 to the EC, the Body of European Regulators for Electronic Communications ('BEREC') and National Regulatory Authorities ('NRAs') in other Member States (the '**Article 7 Notification**') pursuant to the requirements contained in Regulation 13(3) of the Framework Regulations and Article 7(3) of the Framework Directive.

- 1.13 Annex 4 sets out in detail Respondents' views on the questions raised in the Consultation, together with any other issues/concerns raised. This is then followed by a detailed assessment by ComReg, concluding with ComReg's final response to the issues/concerns raised in the Submissions.
- 1.14 Where appropriate, a summary of Respondents' views and ComReg's assessment of such is contained in the main body of the Decision, on a topic-by-topic basis and in a Respondent neutral fashion. Cross references to the relevant paragraphs of Annex 4 is also made where a more detailed assessment of the views of specific Respondents is set out. ComReg's final position on the questions raised in the Consultation is also set out in the main body of the Decision.
- 1.15 The remainder of this Decision is structured as follows:
- Chapter 2 is an executive summary.
 - Chapter 3 provides the background to the Decision.
 - Chapter 4 sets out ComReg's final position on the implementation of a price control obligation of cost orientation.
 - Chapter 5 details the cost modelling that was used to calculate the final Termination Rates.
 - Chapter 6 contains the regulatory impact assessment ('**RIA**').
 - Annex 1 contains the final Decision Instrument for FTRs.
 - Annex 2 contains the final Decision Instrument for MTRs.
 - Annex 3 contains a glossary of terms.
 - Annex 4 contains a detailed analysis of Respondents' views on the Consultation.
 - Annex 5 provides ComReg's consideration of the comments from the EC on the Article 7 Notification.
 - Annex 6 contains a copy of the comments letter from the EC following the Article 7 Notification.

Chapter 2

2 Executive Summary

ComReg's further specification of price control obligations of cost orientation for FVCT and MVCT markets

- 2.1 This Decision is being implemented in conjunction with the Market Review Decision for the FVCT and MVCT markets. This Decision is concerned with the further specification of the cost orientation obligation imposed in the Market Review Decision. A price control obligation of cost orientation may be imposed under Regulation 13 of the Access Regulations¹⁸. Under Regulation 13 ComReg needs to ensure that any cost recovery or pricing methodology that it imposes serves to promote efficiency and sustainable competition and to maximise consumer benefits. In addition, ComReg has to take into account relevant investments made by operators and allow a reasonable rate of return taking into account any risks involved specific to a particular new investment project. Following the consultation process, ComReg is of the view that BU pure LRIC is the most appropriate cost methodology for determining cost-oriented Termination Rates, for both FTRs and MTRs. As explained below in paragraph 2.22 ComReg has decided to implement the termination rates using a glide path based on the BU pure LRIC rates in force prior to this Decision and the BU pure LRIC rate calculated by the models for 2022. Using the glide path rates, this Decision sets the maximum FTRs and MTRs that FSPs and MSPs, designated with SMP in the FVCT and MVCT markets in the Market Review Decision, may charge other Service Providers.
- 2.2 Prior to the Market Review Decision, the FVCT markets were regulated pursuant to ComReg Decision D06/07 ('**2007 FVCT Decision**')¹⁹. The obligation of cost orientation set out in the 2007 FVCT Decision was further specified pursuant to the 2012 Pricing Decision. The MVCT markets were regulated pursuant to ComReg Decision D11/12 ('**2012 MVCT Decision**')²⁰. The obligation of cost orientation set out in the 2012 MVCT Decision was further specified pursuant to the 2016 MTR Pricing Decision. The 2012 Pricing Decision and the 2016 MTR Pricing Decision adopted BU pure LRIC models to determine maximum regulated FTRs and MTRs respectively.

¹⁸ S.I. No. 334/2011 - European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (the '**Access Regulations**').

¹⁹ ComReg Decision D06/07, Document 07/109, "Market Analysis: Interconnection Market Review Fixed Wholesale Call Termination Services", 21/12/2007.

²⁰ ComReg Decision D11/12, Document 12/124, "Market Review Voice Call Termination on Individual Mobile Networks" Response to Consultation and Decision Notice, 21/11/2012.

- 2.3 The European Commission issued the 2009 Termination Rates Recommendation to NRAs across Europe with the aim of avoiding competitive distortions and to ensure a common EU approach to regulating wholesale termination charges. The 2009 Termination Rates Recommendation provides guidance for NRAs on the appropriate cost-based methodology that should be used when calculating the maximum Termination Rates to be charged by FSPs and MSPs designated as having SMP. It recommends that the evaluation of efficient costs be based on current cost and the use of a BU modelling approach using LRIC as the relevant cost methodology. ComReg is obliged to take utmost account of this Recommendation²¹.

Policy context

- 2.4 ComReg has considered the regulatory impact of this Decision in its Regulatory Impact Assessment ('**RIA**') in Chapter 6.

The Consultation

- 2.5 ComReg engaged AM to consider the relevant principles for setting both fixed and mobile call Termination Rates and to present the findings in a report (the '**AM Consultation Pricing Report**')²². The AM Consultation Pricing Report provided a detailed economic analysis of wholesale call termination markets and recommendations for their regulation. Following the Consultation AM has provided an updated report (the '**AM Decision Pricing Report**')²³.
- 2.6 ComReg engaged TERA and AM to develop BU LRIC FTR and MTR cost models respectively. ComReg also requested that the models calculate the long run average incremental costs plus²⁴ ('**LRAIC+**') of services. See Chapter 5 for further details of the modelling approaches.
- 2.7 ComReg issued SIRs to obtain traffic and cost data from FSPs (December 2016) and MSPs (September 2016) provisionally found to have SMP in the Market Review Consultation.

²¹ Pursuant to Regulation 30 of the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No. 333 of 2011) (the '**Framework Regulations**').

²² ComReg document 18/19a, Analysys Mason Report for ComReg, "Pricing principles and methodologies for future regulation of wholesale voice call termination services", 9 March 2018.

²³ ComReg document 19/48a, Analysys Mason Report for ComReg, "Pricing principles and methodologies for future regulation of wholesale voice call termination services", March 2019.

²⁴ Section 4.2.2 of this document explains the difference between LRIC and LRAIC+.

- 2.8 ComReg published the Consultation, the AM Consultation Pricing Report, the FTR Consultation Specification Document and the MTR Consultation Specification Document on 13 March 2018.
- 2.9 The Consultation examined the merits of using LRIC versus LRAIC+ to determine maximum Termination Rates. It consulted on the draft FVCT and MVCT BU pure LRIC models. The draft maximum regulated FTRs and MTRs as calculated using the BU pure LRIC models were set out as part of the Consultation.
- 2.10 ComReg held a workshop in March 2018 on the FTR cost model for FSPs at its offices. The model and results were presented by TERA.
- 2.11 ComReg held a workshop in April 2018 on the MTR cost model for MSPs at its offices. The model and results were presented by AM.
- 2.12 Submissions to the Consultation were received from four operators: Eircom Limited, Tesco Mobile Ireland Limited, Vodafone Ireland Limited and Verizon Ireland Limited.

Developments at a European Level

- 2.13 ComReg published the Consultation in March 2018. The European Commission hosted a workshop in April 2018 on developing a new cost model to understand the costs of providing mobile services (for roaming and call termination) in EU/EEA countries. In this regard the 2018 EECC Directive²⁵ establishing the European Electronic Communications Code (the 'EECC') provides for the European Commission to adopt a delegated act setting a single maximum European Union-wide MTR and a single maximum European Union-wide FTR by 31 December 2020, with these rates intended to come into effect in 2021²⁶. One of the aims of the Commission's modelling project is to set the European Union-wide MTRs that will apply pursuant to the EECC ('**Eurorate MTRs**'). The Eurorate MTRs will replace the existing maximum regulated MTRs that have been set on a national basis by the national regulatory authorities in Member States, including the maximum MTRs set by ComReg pursuant to this Decision.

²⁵ Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (the '**EECC Directive**').

²⁶ Article 75 of the EECC Directive.

- 2.14 Similarly, the European Commission started work in October 2018 on developing a new cost model to understand the costs of providing fixed termination in EU/EEA countries. As noted above, the EECC Directive provides for the European Commission to adopt a delegated act setting a single maximum European Union-wide MTR and a single maximum European Union-wide FTR by 31 December 2020, with these rates intended to come into effect in 2021. The aim of this project is to set the European-Union wide FTRs that will apply to all Member States pursuant to the EECC ('**Eurorate FTRs**'). The Eurorate FTRs will replace the existing maximum regulated FTRs that have been set on a national basis by the national regulatory authorities in Member States, including the maximum FTRs set by ComReg pursuant to this Decision.

The Decision

- 2.15 ComReg has considered the Submissions to the Consultation. These considerations have been summarised in Chapters 4 and 5 and discussed in detail in Annex: 4 of this Decision.
- 2.16 AM updated the AM Consultation Pricing Report to address issues raised in the Submissions. AM also updated the MTR cost model and MTR Consultation Specification Document to address issues raised in the Submissions.
- 2.17 TERA updated the FTR cost model and FTR Consultation Specification Document to address issues raised in the Submissions.
- 2.18 ComReg also considered the work done to date on the European Commission Eurorate MTRs and Eurorate FTRs cost models.
- 2.19 Using the Consultation as a base ComReg then prepared a draft Decision document taking into account the Submissions received and the work on Eurorate MTRs/FTRs.
- 2.20 As part of the decision process ComReg notified the draft Decision to the European Commission, BEREC and NRAs in other Member States (the Article 7 Notification).
- 2.21 Comments were received from the European Commission, see Annex: 6. In this final Decision ComReg has taken utmost account of the comments received, see Annex: 5.

Summary of Decisions

2.22 ComReg has taken account of Submissions on the impact of the level of reduction in Termination Rates resulting from the updated FTR and MTR cost models. One Respondent, Eircom, said it believed that the significant MTR reductions being proposed should be introduced by means of a glide path, rather than by a step change, which could be very disruptive to the market and potentially introduce instability²⁷. ComReg has also taken account of the work being undertaken by the European Commission pursuant to the EECC whereby Eurorate FTRs and Eurorate MTRs are intended to come into force in 2021²⁸. If the maximum regulated MTRs for Ireland arising from this Decision were set at the level of the modelled costs then the MTR for Ireland in 2019 would be the lowest in the EU. The Eurorates will be based on a weighted average of relevant efficient costs for each Member State. The weighting will be based on the number of subscribers in each Member State over the total number of subscribers. As a result the relevant efficient costs for Ireland will have a very small influence on the Eurorates, as the number of subscribers in Ireland represents a very small percentage of the total number of subscribers in the EU. If the Eurorate MTRs were to be close to the current average MTR for the EU then MTRs might rise in Ireland in 2021 when Eurorates come into effect, as the relevant efficient costs resulting from the modelling for this Decision are well below the current average MTR in the EU (0.31€cent/min vs 0.8541€cent/min(weighted)²⁹). Taken the above into account and in order to mitigate or lessen the risk of any instability in the context of the impending implementation of Eurorate MTRs, ComReg has decided to adopt a glide path approach in the implementation of the maximum regulated MTRs. ComReg believes that this approach is reasonable and appropriate given that this will nevertheless result in substantial reductions in MTRs – 15% in 2019 and 18% in 2020

Similar considerations apply to FTRs. In order to reduce the possibility of FTRs being lowered pursuant to this Decision and then raised by operators when the Eurorate FTRs come into effect, and also in order to set maximum FTRs in a manner consistent with the approach to setting maximum MTRs, ComReg has decided to implement FTRs using a glide path. This will still bring substantial reductions in FTRs – 12.5% in 2019 and 9.5% in 2020 (on rates based on a pure per minute charge).

²⁷ See page 3, Executive Summary, part (iv) of the Eircom Submission, published with the other Submissions as ComReg document 19/48s.

²⁸ See further paragraphs 2.13 and 2.14 above.

²⁹ See BEREC BoR (18) 28, 6 Dec 2018, page 16, 'Termination Rates at European level, July 2018',

Fixed Termination Rates

- 2.23 Prior to this Decision the maximum regulated FTR was 0.072 euro cent per minute. That included the cost of call set up. Alternatively the maximum rate could be charged as a combination of a call set-up fee of 0.060 euro cent and a per minute rate of 0.049 euro cent. These maximum rates were in force since 1 July 2015 and were not subject to any automatic expiry date.
- 2.24 Since the Consultation ComReg and TERA consultants have modified the FTR cost model to align it with ComReg's NGN Core Model³⁰ and to incorporate updated cost information from Eircom. This has resulted in changes to the rates produced by the model. Section 5.3 of this Decision, dealing with FTR Modelling, provides the details of the modelling and updates to the FTR cost model. The results of the updated FTR cost modelling are shown in Table 1 below:

Table 1: Fixed Termination Costs on a Call Set-up Fee and Call Duration Basis

Year	Call set up cost per minute in euro cent	Call duration cost per minute in euro cent
Rate in 2019 prior to Decision	0.060	0.049
2019	0.071	0.025
2020	0.068	0.025
2021	0.065	0.028
2022	0.062	0.024

- 2.25 On a per minute basis only, i.e. the per call cost is included in the per minute rate³¹, the fixed termination costs are shown in Table 2 below:

Table 2: Fixed Termination Costs on Call Duration Basis only

Year	Cost per minute in euro cent
Rate in 2019 prior to Decision	0.072
2019	0.049

³⁰ See paragraphs 5.8 and 5.9 for details of the NGN (next generation network) core model

³¹ A per minute only call rate has been calculated from the per call and per minute costs using an average call duration of 2.98 minutes.

Year	Cost per minute in euro cent
2020	0.047
2021	0.050
2022	0.045

- 2.26 ComReg has decided to use a glide path for maximum regulated FTRs based on the rate in effect prior to this Decision and the modelled BU-LRIC output for 2022 in Table 1 above. These rates will remain in effect until replaced by Eurorate FTRs. The resulting maximum FTRs are shown in Table 3 below:

Table 3: FTR based on Glide Path

FTR – two-part and one-part call charges	Rate in 2019 prior to Decision	2019	2020	2021	From 2022
(A) Two-part charge: call set-up fee	0.060	0.061	0.061	0.062	0.062
(B) Two-part charge: per minute fee	0.049	0.043	0.037	0.030	0.024
One-part charge: per minute fee	0.072	0.063	0.057	0.051	0.045

Mobile Termination Rates

- 2.27 The maximum regulated MTR prior to this Decision was 0.79 euro cent per minute. Mobile termination costs as per the MTR cost model are as follows in Table 4.

Table 4: Mobile Termination Costs from MTR cost model

Year	Maximum cost per minute euro cent
2019	0.33
2020	0.32
2021	0.31
2022	0.31

- 2.28 ComReg has decided to use a glide path to set the regulated MTRs as per Table 5 below, based on the rate in effect prior to this Decision and the BU LRIC model output for 2022 in Table 4 above, see paragraphs 5.169 to 5.174 for further details.

Table 5: Mobile Termination Rates based on Glide Path

Year	Maximum cost per minute euro cent
2019	0.67
2020	0.55
2021	0.43
From 2022	0.31

- 2.29 Both maximum regulated FTRs and MTRs as per this Decision will come into force on the first working day following two full calendar months³² after publication of the Decision i.e. the rates will be valid from 1 August 2019.

³² Where the first such “full calendar month” will be the period which begins on the first day of the month immediately following the month in which the Decision is published, and ends on the last day of that month.

Chapter 3

3 Background

3.1 Overview

- 3.1 This chapter outlines the regulatory framework within which ComReg operates, specifically with regard to the obligation to conduct an analysis of relevant markets, the need to determine whether a market is effectively competitive and, if not, to consider the appropriate SMP designation(s) of Service Providers and the regulatory obligations that should be imposed.
- 3.2 This chapter then outlines the existing price controls for those Service Providers designated with SMP in the FVCT and MVCT markets and provides a summary of the recent Market Review, the information sources and the Consultation process. This chapter concludes with a review of the recent developments at a European level.

3.2 Legal Basis and Regulatory Framework

- 3.3 The regulatory framework imposes a number of obligations on ComReg, including Regulation 27(1) of the Framework Regulations. This requires that ComReg shall carry out an analysis of the relevant markets, taking utmost account of the markets identified in the 2014 EC Recommendation³³ and referred to in Article 15(1) of the Framework Directive³⁴.

The 2014 EC Recommendation

- 3.4 The Commission Recommendation on relevant markets of 9 October 2014, which replaces the 2007 EC Recommendation³⁵, sets out a list of markets which the European Commission has identified as warranting *ex-ante* regulation.
- 3.5 The markets identified in the 2014 EC Recommendation include wholesale voice call termination on public telephone networks provided at a fixed location and on individual mobile networks.

³³ European Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation (the '**2014 EC Recommendation**').

³⁴ Article 15(1) Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, as amended by Directive 2009/140/EC (the '**Framework Directive**'). The Framework Regulations transpose the Framework Directive.

³⁵ Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation (the '**2007 EC Recommendation**').

The Framework Regulations

- 3.6 In circumstances where ComReg determines that a relevant market is not effectively competitive, it shall, in accordance with Regulation 27(4) of the Framework Regulations, designate undertakings with SMP and impose appropriate specific regulatory obligations. This has been done in the Market Review Decision.

The Access Regulations

- 3.7 Where an operator has been designated as having SMP on a relevant market as a result of a market analysis carried out in accordance with Regulation 27 of the Framework Regulations, ComReg is obliged, in accordance with Regulation 8(1) of the Access Regulations,³⁶ to impose on the operator such of the obligations set out in Regulation 9 to 13 of the Access Regulations as ComReg considers appropriate. Regulation 13 of the Access Regulations relates to 'Price Control and Cost Accounting Obligations'.
- 3.8 Regulation 8(6) requires that any such obligation shall:
- (a) be based on the nature of the problem identified;
 - (b) be proportionate and justified in the light of the objectives laid down in Section 12 of the Communications Regulation Act 2002 (as amended) and Regulation 16 of the Framework Regulations; and
 - (c) only be imposed following consultation in accordance with Regulation 12 and 13 of the Framework Regulations.

³⁶ S.I. No. 334/2011 - European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (the '**Access Regulations**').

- 3.9 Under Regulation 13 of the Access Regulations, where a market analysis indicates that a lack of effective competition means that the operator concerned may sustain prices at an excessively high level or may apply a price squeeze to the detriment of end-users, ComReg may impose obligations relating to cost recovery and price controls on the operator. To encourage investments by the operator, including in next generation networks, ComReg shall, when considering the imposition of such obligations, take into account the investment made by the operator which ComReg considers relevant and allow the operator a reasonable rate of return on adequate capital employed, taking into account any risks involved specific to a particular new investment network project. ComReg 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. In this regard, ComReg may also take account of prices available in comparable competitive markets.

Communications Regulation Act 2002 (as amended)

- 3.10 Section 12(1)(a) of the Communications Regulation Act 2002 (as amended) sets out ComReg's objectives in exercising its functions in relation to the provision of electronic communications networks, electronic communications services and associated facilities, namely to:
- (a) Promote competition;
 - (b) Contribute to the development of the internal market; and
 - (c) Promote the interests of users within the European Union.

Notification to European Commission

- 3.11 Apart from conducting a public consultation in accordance with Regulation 12 of the Framework Regulations, ComReg is also obliged to make its draft measures accessible to the European Commission, BEREC and NRAs in other Member States pursuant to Regulation 13(3) of the Framework Regulations.

The 2009 Termination Rates Recommendation

- 3.12 In 2009, and in accordance with Article 19(1) of the Framework Directive, the European Commission issued the 2009 Termination Rates Recommendation on the regulatory treatment of fixed and mobile termination rates in the EU.

- 3.13 The 2009 Termination Rates Recommendation provides guidance for NRAs on the appropriate cost-based methodology that should be used when calculating the maximum Termination Rates to be charged by FSPs and MSPs designated as having SMP in FVCT and MVCT respectively. It recommends that the evaluation of efficient costs be based on current cost and the use of a BU modelling approach using long-run incremental costs (LRIC) as the relevant cost methodology. In addition to taking account of the relevant statutory criteria and objectives mentioned above, ComReg is obliged to take utmost account of this Recommendation. The European Commission also recommends in the 2009 Termination Rates Recommendation that Termination Rates should be symmetrical i.e., set at the same level for all FSPs and, separately, set at the same level for all MSPs.

3.3 Regulatory Price Controls

Fixed Voice Call Termination Price Control Obligation

- 3.14 Prior to the Market Review Decision, the FVCT market was regulated pursuant to the 2007 FVCT Decision. Having determined that the markets for wholesale call termination on fixed networks were not effectively competitive, ComReg, in accordance with Regulation 25 and Regulation 27(4) of the Framework Regulations 2003³⁷, then designated seven FSPs³⁸ with SMP in their relevant FVCT markets.
- 3.15 ComReg, in light of the objectives set out in Regulation 8(6) of the Access Regulations 2003³⁹, was required to impose on an SMP operator(s) *ex ante* regulatory obligations that were appropriate, based on the nature of the problem identified, and proportionate and justified in light of ComReg's objectives. ComReg, in the 2007 FVCT Decision, imposed obligations concerning access to and use of, specific network elements and associated facilities, transparency, non-discrimination, accounting separation, price control and cost accounting⁴⁰. Pursuant to Regulation 14(1) of the Access Regulations 2003, the price control obligation of cost orientation was specified based on a forward looking long run incremental costs ('**FL-LRIC**') basis.

³⁷ European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2003 (the '**Framework Regulations 2003**').

³⁸ BT Communications Ireland Limited ("BT Limited"); Colt Telecom Ireland Limited; Eircom Limited ("Eircom"); Magnet Networks Limited; Virgin Media (previously NTL Communications (Ireland) Limited and Chorus Communications Limited); Smart Telecom (acquired by "Digiweb") and Verizon Ireland Limited ("Verizon").

³⁹ The European Communities (Electronic Communications Networks and Services) (Access) Regulations 2003 (the '**Access Regulations 2003**').

⁴⁰ Pursuant to the Access Regulations 2003.

- 3.16 The price control obligation of cost orientation for these FVCT markets was further specified pursuant to the 2012 Pricing Decision, with Section 4.5 of the FTR Decision Instrument in the 2012 Pricing Decision requiring that each FSP with SMP in FVCT ensure that its FTRs were set in accordance with a pure LRIC methodology from 1 July 2013.

Mobile Voice Call Termination Price Control Obligation

- 3.17 Prior to this Decision, the MVCT market was regulated pursuant to the 2012 MVCT Decision. Having determined that the markets for wholesale call termination on mobile markets were not effectively competitive, ComReg, in accordance with Regulation 25 and Regulation 27 of the Framework Regulations, designated six MSPs⁴¹ with SMP in the relevant MVCT market(s).
- 3.18 In the 2012 MVCT Decision ComReg imposed SMP obligations on SMP MSPs relating to access, non-discrimination, transparency and price control⁴². Pursuant to Regulation 13(1) of the Access Regulations, a price control obligation of cost orientation was specified.
- 3.19 The price control obligation of cost orientation for this market was further specified in the 2012 Pricing Decision and subsequently finalised in the 2016 MTR Pricing Decision, whereby ComReg required that each MSP with SMP in MVCT ensure that its MTR was no more than the rate determined for that year in accordance with the BU pure LRIC model.

3.4 Market Review

- 3.20 In October 2017 and in accordance with Regulation 12 of the Framework Regulations, ComReg issued the Market Review Consultation which set out ComReg's preliminary views based on an analysis of the relevant termination markets.
- 3.21 The Market Review Decision, published at the same time as this Decision, considered the submissions received to the Market Review Consultation.

⁴¹ Three (H3GI); Lycamobile; Meteor (rebranded as "eir Mobile"); Telefónica (now part of H3GI); Tesco Mobile; Vodafone.

⁴² In accordance with Regulations 8, 9, 10, 12, and 13 of the Access Regulations.

- 3.22 The Market Review Decision identified 22 relevant FVCT markets (**‘Relevant FVCT Markets’**) and 6 relevant MVCT markets (**‘Relevant MVCT Markets’**) (see Table 6 and Table 7 below) in which it designated operators with SMP and imposed obligations of transparency, non-discrimination, access and price control. The price control obligation of cost orientation was imposed on all such SMP Service Providers, with the Market Review Decision stating that the detailed nature of the specific costing methodology being adopted in light of the cost orientation obligation was to be set out in the separate pricing Decision (i.e. this Decision).

Table 6 Designated SMP FSPs

Designated SMP FSPs	
1	Airspeed Communications Unlimited
2	BT Communications Ireland Limited
3	Blue Face Limited
4	Colt Technology Services Limited
5	Dialoga Servicios Interactivos, SA
6	Eircom Limited
7	Equant Network Systems Limited
8	Finarea SA
9	Imagine Communications Ireland Limited
10	Intellicom Ireland Limited
11	Internet Protocol Telecom Limited
12	In2com Limited
13	Magnet Networks Limited
14	Magrathea Telecommunications (Ireland) Limited
15	Modeva Networks Unlimited
16	PlanNet 21 Communications Limited

17	Telcom Limited
18	Verizon Ireland Limited
19	Viatel Ireland Limited
20	Virgin Media Ireland Limited
21	Vodafone Ireland Limited
22	Voxbone SA

Table 7 Designated SMP MSPs

Designated SMP MSPs	
1	Meteor Mobile Communications Limited
2	Lycamobile Ireland Limited
3	Tesco Mobile Ireland Limited
4	Three Ireland (Hutchison) Limited
5	Virgin Media Ireland Limited
6	Vodafone Ireland Limited

3.5 Information Sources

- 3.23 In developing the draft MTR and FTR cost models, ComReg used information provided by Service Providers for ComReg's QKDR and obtained additional up-to-date data on costs, network traffic levels and forecasts from FSPs and MSPs through detailed SIRs and subsequent informal requests.
- 3.24 During the Consultation process, workshops were held with Service Providers where access to non-confidential versions of the draft MTR and FTR cost models was made available and ComReg also asked Service Providers to submit any additional information that would be relevant for modelling fixed and mobile termination.

3.25 In coming to its Decision ComReg has also considered the regulation of termination markets and associated prices in other markets together with studies from BEREC and regulatory research bodies.

3.6 Consultation Process

3.26 On 13 of March 2018 ComReg published the Consultation seeking views from interested parties on a number of proposals, including the most appropriate approach to implementing a cost orientation obligation.

3.27 During the consultation process, ComReg held two workshops, one for FSPs and another for MSPs. The fixed termination modelling workshop was held in March 2018. TERA, ComReg's advisor, presented the key model principles, a description of the draft cost models and the draft results. A question and answer session also took place with the minutes of the workshop and the presentation being emailed to all FSPs after the workshop.

3.28 The mobile termination modelling workshop was held in April 2018. AM, ComReg's advisors, presented the key model principles, a description of the draft cost models and the draft results. A question and answer session also took place with the minutes of the workshop and the presentation being emailed to all MSPs after the workshop.

3.29 By the deadline of April 25 2018 ComReg received Submissions to the Consultation from the following Respondents:

- Eircom Limited;
- Tesco Mobile Ireland Limited;
- Verizon Ireland Limited; and
- Vodafone Ireland Limited.

3.30 ComReg has considered all of the Submissions in reaching its final Decision. ComReg has in Annex 4 of the Decision outlined the points raised in the Submissions in response to the Consultation questions together with other issues/concerns and set out ComReg's assessment of such and response to the issue or concern raised. ComReg's final position on the issues raised by each question of the Consultation is set out in the main body of the Decision.

3.31 Non-confidential Submissions to the Consultation have been published as document 19/48s as part of this Decision.

3.7 Regulation of Termination Rates at European Level

Single EU-wide Wholesale Termination Rates

- 3.32 The European Electronic Communications Code (EECC) entered into force on 20 December 2018.⁴³ As part of the EECC the European Commission is scheduled to adopt, by 31 December 2020, a delegated act setting a single maximum FTR and a single maximum MTR for all EU Member States.⁴⁴ These rates are intended to come into force in 2021. See further paragraphs 2.13 and 2.14.
- 3.33 The European Commission and its consultants Axon (with assistance from NRAs and operators of all EEA countries) are developing cost models which will derive pure LRIC FTRs and MTRs on a country-by-country basis. All NRAs and operators have been invited to participate in the finalisation of the methodologies/approaches, in the completion of data requests and in the review of the draft models.
- 3.34 The European Commission will set a maximum single rate for each termination service (fixed and mobile) for the EU for a five year period (i.e., the Eurorate FTRs and Eurorate MTRs). It is envisaged therefore that when these enter into force they will replace the maximum MTRs and FTRs set in this Decision. The level of the Eurorate FTRs and Eurorate MTRs, and the manner of their implementation, is not known at present. ComReg will review developments in this regard and will consider appropriate revisions to, or revocations of, this Decision as necessary in light of the entry into force of Eurorate FTRs and MTRs.⁴⁵

Current Rates in EEA

- 3.35 BEREC⁴⁶ issued a report dated 6 December 2018 entitled 'Termination rates at European level - July 2018'. Figure 1 below sets out the FTRs on a country-by-country basis for those countries using a LRIC approach. The FTRs range from a low of 0.0369 € cent per minute for the UK, to a high of 0.14 € cent per minute for Romania.

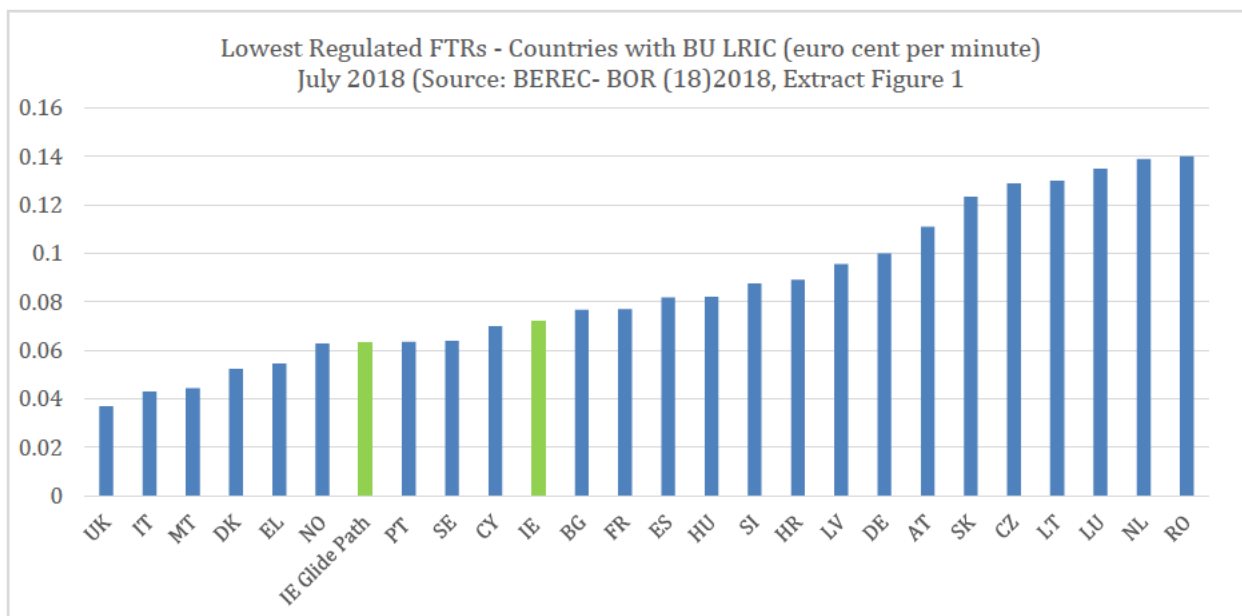
⁴³ Pursuant to the EECC Directive.

⁴⁴ Pursuant to Article 75 of the EECC Directive.

⁴⁵ By letter to ComReg dated 2 April 2019, Eircom raised various queries in relation to the Market Review Decision, and in particular the approach to the terminating of calls originated outside the European Economic Area/EEA proposed in the Market Review Consultation. Eircom also requested clarification about the potential effects of the introduction of Eurorates. A copy of Eircom's letter and ComReg's detailed response is contained in Annex 11 of the Market Review Decision.

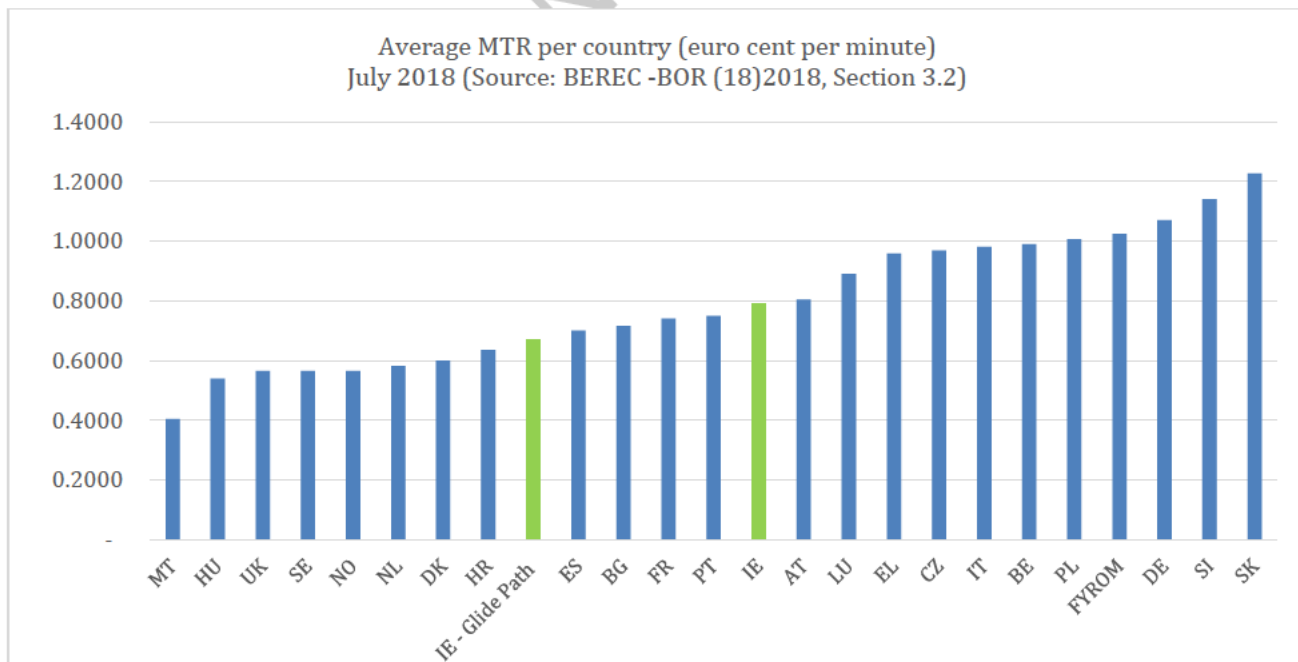
⁴⁶ https://bereg.europa.eu/eng/document_register/subject_matter/bereg/reports/8306-termination-rates-at-european-level-july-2018

Figure 1: FTRs – Countries with BU LRIC (euro cent per minute) July 2018⁴⁷



3.36 Figure 2 below sets out the MTRs on a country-by-country basis for those countries using a LRIC approach. The MTRs range from a low of 0.4045 € cent per minute for Malta, to a high of 1.2260 € cent per minute for Slovak Republic.

Figure 2: MTRs – Countries with BU LRIC (euro cent per minute) July 2018⁴⁸



⁴⁷ The 'IE Glide Path' rate relates to the first step of the Glide Path i.e. 0.063 euro cent per minute for 2019 for FTRs.

⁴⁸ The 'IE Glide Path' rate relates to the first step of the Glide Path i.e. 0.67 euro cent per minute for 2019 for MTRs.

Chapter 4

4 Cost Orientation Approach

4.1 Overview

- 4.1 In July 2016 ComReg appointed AM to produce a report to assess all relevant price control models/methodologies relating to MTRs/FTRs that are consistent with the Market Review Consultation and ComReg's regulatory objectives, and to recommend a preferred option.
- 4.2 AM prepared the AM Consultation Pricing Report for ComReg. A non-confidential version of this report was published on ComReg's website, document number 18/19a, as part of the Consultation.
- 4.3 AM, having considered the Submissions received to the Consultation, produced the AM Decision Pricing Report for ComReg. A non-confidential version of this Report is published on ComReg's website, document number 19/48a, as part of the Decision.
- 4.4 This chapter represents an update of Chapter 4 of the Consultation. The Consultation set out the key characteristics that need to be considered when building a cost model, as follows:
 - Approaches to Implement a Cost Orientation Methodology – see Section 4.2.1 of the Consultation document (Bottom Up or Top Down Model) and the associated Q.1 and Section 4.2.2 of the Consultation document (Choice of Increment) and the associated Q.2;
 - Economic Cost Recovery – see Section 4.3 of the Consultation document and the associated Q.3;
 - Network Nodes – see Section 4.4 of the Consultation document and the associated Q.4 and Q.5;
 - Symmetry of Termination Rates – see Section 4.5 of the Consultation document and the associated Q.6;
 - Consistency in Approaches for FVCT and MVCT – see Section 4.6 of the Consultation document and the associated Q.7; and
 - Cost Modelling Principles – see Section 4.7 of the Consultation document.
- 4.5 ComReg consulted on its analysis and preliminary views of these characteristics and sought responses to questions 1 to 7 set out in the Consultation in relation to these.

- 4.6 Two Respondents replied directly to those questions.
- 4.7 The Submissions received in response to the questions raised are summarised in Annex 4 of this Decision (paragraphs A 4.6 to A 4.148) along with ComReg's assessment of the issues or concerns raised and its final response.
- 4.8 ComReg's views of the key characteristics (as set out above) that need to be considered when building a cost model are set out in Sections 4.2 to 4.7 of this Decision, along with its final position on the questions raised having considered the views of Respondents to the Consultation.

4.2 Approaches to Implement a Cost Orientation Methodology

- 4.9 The Consultation document identified that there are two potential means of implementing a cost orientation methodology: benchmarking and cost modelling.
- 4.10 ComReg has, in the past, applied a benchmarking approach to set Termination Rates (see the 2012 Pricing Decision). Following an appeal by Vodafone against the 2012 Pricing Decision, the High Court in its judgement found that the benchmarking approach adopted by ComReg in this instance (and recommended by the European Commission) for setting MTRs was outside the scope of what is provided for in the relevant EU and Irish legislation⁴⁹. ComReg therefore proposed (in the Consultation) not to adopt a benchmarking approach with respect to FTRs and MTRs. Benchmarking was therefore not considered further in the Consultation document.
- 4.11 In building a cost model, two key questions were identified that need to be considered:
- Is the model bottom-up ('BU') or top-down ('TD')?; and
 - What increment should be used?

These questions are considered in the following two sections.

⁴⁹ See ComReg Information Notice 13/80 'High Court Judgment on Mobile Termination Rates' (paragraph 5). ComReg appealed the High Court finding but the matter was later settled before trial. See: https://www.comreg.ie/media/dlm_uploads/2015/12/ComReg1380.pdf

4.2.1 Bottom Up or Top Down Model

- 4.12 The type of cost model to be built is dependent on the form of modelled operator. The 2009 Termination Rates Recommendation states that “*NRAs should set termination rates based on the costs incurred by an efficient operator*”. ComReg recognised that the form the modelled operator takes can have a significant impact on the estimated cost profile. The AM Consultation Pricing Report (see Section 5.1) identified four types of operator that can be modelled and recommended modelling a hypothetical existing operator. ComReg, in the Consultation, was of the preliminary opinion that this allows for the modelling of efficient costs and scale, whilst at the same time enabling costs and technology assumptions to be closely aligned with those actually faced by the operators currently in the Irish market.
- 4.13 The Consultation identified that cost modelling of networks can be carried out using two structures, referred to as ‘top-down models’ and ‘bottom-up models’.
- 4.14 As set out in Section 4.1 of the AM Consultation Pricing Report, a top-down model (**‘TD Model’**) starts from an existing ‘TD’ network cost base and determines incremental costs. AM considered (see Section 4.1 of the AM Consultation Pricing Report) that there may be efficiency adjustments and potential cost adjustments to reflect the costs of modern assets. AM noted that while this method can be useful for an operator to determine its own cost base, it is not necessarily the best modelling approach to determine the cost of an efficient operator for transparent regulatory purposes.
- 4.15 ComReg, in the Consultation, was of the preliminary opinion that a TD Model, based on operator accounts, is not an appropriate way within which to model the costs of an efficient operator⁵⁰ for a number of reasons. For example, there may be insufficient detail available within the operators’ accounts to analyse costs down to unit cost level. There could be inconsistent data inputs across operators, in terms of the level of detail of data, the dimensions and the data structure etc. The direct use of operator data also runs the risk of internalising operator inefficiencies into the cost calculations.
- 4.16 The Explanatory Note to the 2009 Termination Rates Recommendation⁵¹ (page 13) notes however that:

⁵⁰ See Section 3.27 of ComReg Consultation Document 14/29 “Mobile Termination Rates: Draft Bottom Up Pure Long Run Incremental Cost Model” - <https://www.comreg.ie/csv/downloads/ComReg1429.pdf>

⁵¹ Explanatory Note accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (SWD(2014) 298) (**‘Explanatory Note’**).

"TD models are said to avoid disincentives to invest, since incurred costs are usually allowed to be recovered, even if this does not necessarily promote efficiency".

4.17 In a bottom-up model ('**BU Model**') costs can be more readily constructed to reflect the choices of a hypothetically efficient operator from both a technical and operational perspective.

4.18 Section 4.1 of the AM Consultation Pricing Report identified that a BU Model provides the most commonly used approach to determine the costs of a hypothetical efficient operator. The network is built from the bottom up starting with the traffic/subscribers carried by the operator modelled. Only the assets required to handle this traffic (in a forward-looking situation) are taken into account, and so inefficiencies are excluded. AM explains however that the level of efficiency can be 'selected' through the choice of technologies modelled and assets used, e.g. only modern equivalent assets⁵² ('**MEA**'), and various other parameters such as maximum utilisation factors.

4.19 The Explanatory Note to the 2009 Termination Rates Recommendation (page 13) states that:

"BU models use demand data as a starting point and determine an efficient network capable of serving that demand by using economic, engineering and accounting principles. BU models give more flexibility regarding network efficiency considerations and reduce the dependence on the regulated operator for data."

4.20 The Explanatory Note also notes that a BU Model does not guarantee that all costs that were actually incurred are recovered because it focuses on the theoretical concept of developing a network of an "efficient" operator using the relevant equipment rather than taking account of the equipment actually provided or the associated legacy costs.

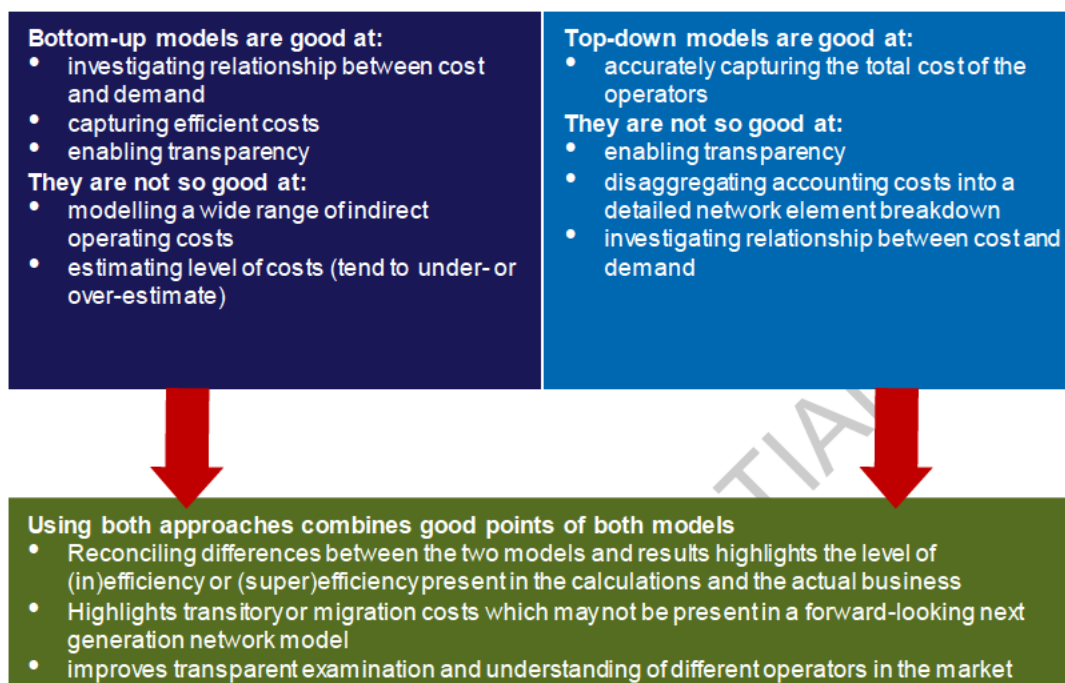
4.21 In light of this, Recital 11 of the 2009 Termination Rates Recommendation notes that:

"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 cost and cost allocation between a hypothetical and a real operator."

⁵² Modern Equivalent Asset ('**MEA**') cost refers to what it would cost to replace an old asset with a technically up to date new asset with the same service capability as the old asset.

- 4.22 Figure 4.1 in the AM Consultation Pricing Report provided a comparison of the merits of the two approaches and a "hybridised" approach (combination of both approaches), which is reproduced below in Figure 3 below.

Figure 3: Comparison of Top-down and Bottom-up Models



Source: AM Consultation Pricing Report, Figure 4.1

- 4.23 Recitals 2 and 3 of the 2009 Termination Rates Recommendation recommend that the evaluation of efficient costs be based on the use of a BU modelling approach and says that NRAs may compare the results with a TD model with a view to verifying and improving the robustness of the results and may make adjustments accordingly. Section 4.2 of the AM Consultation Pricing Report also recommended the use of a BU Model, with TD validation of the BU Model outputs where appropriate.
- 4.24 In light of the concerns with a TD approach (as set out in paragraph 4.15 above) ComReg's preliminary view (as set out in paragraph 4.19 of the Consultation) was that BU Models for hypothetical efficient existing operators for the FVCT and MVCT markets should be developed.

ComReg's Assessment of Respondents' Views on Question 1

- 4.25 In the Consultation ComReg asked interested parties if they agreed or disagreed that the cost orientated models for setting maximum FTRs and MTRs should be BU Models of hypothetical efficient operators.

- 4.26 Two Respondents replied directly to this question and their views are set out in Annex 4 - Paragraph A 4.6 to A 4.9 of this Decision. Both of the Respondents were in general agreement with the use of BU Models of hypothetical efficient operators for setting maximum Termination Rates.
- 4.27 One Respondent (as set out in Annex 4 - Paragraph A 4.10) raised a concern regarding the certainty as to the accuracy of a BU Model and stated that models should be calibrated against the spend of actual operators.
- 4.28 ComReg's detailed response to this concern is set out in Annex 4 - paragraph A 4.12 to A 4.15 below. ComReg considers that both the MTR and FTR cost models are accurate given that they are based on most recent actual information and forecasts (as provided by operators), with the inputs being subject to extensive calibration exercises and sensitivity checks by ComReg's consultants, TERA and AM. Other relevant issues raised (specifically as to the accuracy of the model and whether the rates calculated by the model are too low), are assessed by ComReg in Annex 4 - paragraphs A 4.16 to A 4.20.
- 4.30 While not responding directly to this question, two further Respondents raised comments which ComReg has dealt with under this question. These comments, ComReg's assessment of such and ComReg's response, are set out in Annex 4 – paragraphs A 4.21 to A 4.25 of this Decision.

ComReg's Final Position - Question 1

- 4.31 Having considered the views of Respondents, ComReg's final position is that the cost orientated models for setting maximum FTRs and MTRs should be BU Models of hypothetical efficient operators.

4.2.2 Choice of Increment

- 4.32 ComReg identified that the relevant increment of termination costs can be determined under one of the costing methodologies set out in Table 8 below. This table also summarises the key differences in five possible costing methodology variants used to determine costs associated with call termination:

Table 8: Cost Methodologies

Method	Description
LRAIC (‘A’ is for ‘average’)	This considers a large increment (e.g. all traffic services provided by the network) and allocates the incremental cost of traffic between the volumes of these services, using ‘average traffic routing factors’. Each service, including voice termination, therefore receives a share of intra-traffic network common costs.
LRAIC+	This is calculated in the same way as LRAIC, except that one or more mark-ups are applied to the network costs to capture other costs (e.g. business overheads).
(Pure) LRIC	<p>This considers a small increment (e.g. each individual service). The pure incremental cost of a service is considered to be the costs avoided by not providing that service on the network, treating it as the last service in the service stack.</p> <p>This is the approach specified in the 2009 Termination Rates Recommendation, with the relevant costs being the traffic-sensitive costs of a network providing all services, less the traffic-sensitive costs of a network providing all services except wholesale voice termination.</p>
LRIC+	As calculated for the (pure) LRIC, except that one or more mark-ups are applied to capture common costs. In Annex A of the 2009 Termination Rates Recommendation, business overhead costs are specifically excluded from the mobile case (along with retail and coverage costs).
Marginal cost (MC)	This can consider even smaller increments than pure LRIC (e.g. part of the volume of an individual service, perhaps only one unit e.g. one voice minute). The marginal cost is considered to be the additional network costs of serving that additional volume with the network.

- 4.33 In assessing which variant should be adopted, the AM Consultation Pricing Report (Section 3.2.1) identified the following factors that needed to be considered⁵³:
- The two-sided market structure;
 - Associated externalities;
 - Relationship to market competitiveness and efficiency;
 - Impact on relevant markets; and
 - Regulatory best practice.
- 4.34 In the Consultation, ComReg used this structure to frame its own consideration of this issue while having regard to the findings of the AM Consultation Pricing Report. The impact of each approach on competition between operators was considered e.g. the effects of differences in price between on-net and off-net calls and the impact on competition between operators with asymmetric market share. ComReg also considered the approach that would provide the best outcome for the consumer.
- 4.35 In the Consultation ComReg was of the preliminary opinion that cost orientation by means of a pure LRIC methodology is the most appropriate approach to set Termination Rates in Ireland. ComReg asked interested parties (Question 2) if they agreed that cost orientation by means of a pure LRIC methodology is the most appropriate approach to set Termination Rates in Ireland.
- 4.36 ComReg received two direct replies to this question. Two key issues were raised by Respondents relating to the appropriateness of pure LRIC and the recovery of common costs. These are dealt with in detail in paragraphs A 4.26 to A 4.103
- 4.37 One Respondent, while agreeing that cost orientation by means of a pure LRIC methodology was the most appropriate approach, argued that it is imperative that it is allowed to recover all of its efficiently-incurred fixed and common costs. Another Respondent on the other hand did not agree with the choice of LRIC, favouring the use of LRAIC+ instead.

⁵³ The factors considered by AM were linked to ComReg's relevant statutory objectives under Section 12 of the Communications Regulation Act 2002 (as amended) and Regulation 13 of the Access Regulations. For further information please refer to Section 3.2.1 of the AM Consultation Pricing Report.

- 4.38 For ease of analysis, ComReg discusses below the Submissions received relating to each factor in turn (as set out in Paragraph 4.33 above), its assessment of such and concludes with its final position at paragraph 4.107.

Two-sided Market Structure

- 4.39 As outlined in the Consultation, the market for call termination is a two-sided market in that the subscriber of any operator can call a subscriber of any other operator and vice-versa. What distinguishes a 'two-sided' from a 'one-sided' market is that consumers on either side derive value from the presence of the other group.
- 4.40 If we consider the FVCT markets on their own, then if traffic flows are balanced between operators, the FTR rate could be set at any level e.g. very high or very low and the net financial position of all operators would be zero. The same is true for the MVCT markets. As FTRs and MTRs are not likely to be the same, then even under balanced traffic between a FSP and a MSP, the net financial position of each operator would be impacted by the size of the Termination Rates. Given current Termination Rate levels, this net impact would be small in the context of their overall business.
- 4.41 The two-sided nature of the market means that while the originating and terminating operator share the benefits of the call (via their respective subscribers), they both also compete against each other and with other operators in downstream markets. This has the potential to create competitive distortions. Each operator will have an incentive to raise its rivals' costs (by charging high Termination Rates) in order to give itself a relative competitive advantage.
- 4.42 Excessive pricing could have an impact at both wholesale and retail levels. At the wholesale level, operators that send more outbound traffic off-net than they receive would face overall higher costs than operators that have a more favourable on-net / off-net traffic flow profile. Higher wholesale charges could have an impact at the retail level in the form of higher tariffs that the customer would have to pay (on the assumption that Termination Rates feed through into retail prices).
- 4.43 Furthermore, if smaller operators, who tend to have more off-net traffic than on-net traffic, chose to pass on these higher termination tariffs to their subscribers, for example by way of higher off-net retail tariffs, they would likely place themselves at a significant competitive disadvantage since, on average, the opportunities for on-net calling for consumers will by definition be fewer for customers of smaller operators. As noted below, in considering the impact on end users, the lower Termination Rates tend to lower the floor at which off-net retail prices would be set.

- 4.44 A further distortion can arise between fixed and mobile operators collectively. The payment of excessive MTRs by fixed operators would amount to a subsidy to mobile operators. This benefit could then be passed onto the retail customers of the mobile operators in the form of reduced prices. The same would be true in the reverse situation were FTRs to be set at an excessive level. Even if such subsidies were competed away at the retail level, there would nevertheless be a distortion of competition given that retail prices would not reflect the efficient underlying costs.
- 4.45 In general, setting wholesale Termination Rates at incremental cost will alleviate these problems. In this context, it is worth noting that in telecommunications networks most costs are fixed and long term in nature with such networks supporting a range of services.
- 4.46 The two-sided nature of termination markets implies that the closer prices are set to an incremental cost specific to that service over the long term, the more likely the regulatory objectives of avoiding competitive distortions and encouraging efficient investment will be met. This implies that methods involving broader increments such as LRAIC or LRAIC+ will be less appropriate than for other regulated services which lack this two-sided nature.
- 4.47 A further consideration is whether a mark-up should be included to allow for the recovery of costs which are common to services outside the defined increment (for example business costs such as corporate overheads).
- 4.48 AM (in Section 3.2.1 of its AM Consultation Pricing Report) was of the opinion that the common costs incurred relating to incoming and outgoing traffic can be recovered from either an operator's own subscribers (e.g. outgoing on-net charges and/or fixed monthly fee), or from its competitors' subscribers (via Termination Rate charged) but the operator concerned would also experience the reverse situation for the recovery of the competitor's common costs (via Termination Rate charged).
- 4.49 Given the two-sided nature of termination markets, ComReg, as set out in the Consultation, was of the preliminary view that a LRIC approach was more appropriate.

Respondent Views and ComReg's Assessment – Two-sided Market Structure

- 4.50 One Respondent discussed the impact of the two-sided market on the choice of increment, expressing concerns that ComReg (i) failed to demonstrate in this context why LRAIC or LRAIC + were less appropriate than LRIC; (ii) failed to consider and balance the impact on all parties. This is summarised in Annex 4 - Paragraph A 4.37 to A 4.38 below and ComReg's assessment can be found in Annex 4 - Paragraph A 4.56 to A 4.67.
- 4.51 Following an assessment of the views of this Respondent, ComReg remains of the opinion that a LRIC approach is more appropriate given the two-sided nature of termination markets.

Associated Externalities

- 4.52 In the Consultation ComReg addressed whether the presence of externalities would justify a deviation from cost either by way of mark up or mark down of termination prices. An externality is the cost or benefit that affects a party who did not choose to incur that cost or gain that benefit.
- 4.53 There are three types of relevant externalities: network, call and tariff-mediated externality.

Network Externalities

- 4.54 Network externalities occur when existing users benefit from maintaining additional (marginal) subscribers on the network. There is therefore an argument to structure tariffs so as to encourage increased subscriber numbers. By reducing the cost to new subscribers of joining a network, existing subscribers may benefit in terms of increased calling opportunities. Accordingly, under this argument, a cross subsidy from network usage tariffs to reduce the cost of joining a network (such as for example by way of handset subsidies) may be justified. This could be implemented by way of a mark up to termination prices.
- 4.55 ComReg did not however agree with this view for the following reasons:
- Firstly as set out in Section 3.2.2 of the AM Consultation Pricing Report, the Irish market is substantially saturated and the benefits of increased subscriber penetration are likely to be minimal.

- Secondly the LRIC of termination has been established as being at a level that is no longer particularly material to operators. AM in the AM Consultation Pricing Report (see Section 3.2.3) noted that the share of termination revenue as a proportion of total revenues for MNOs and FNOs is 2% and 0.1% respectively. A mark up on termination that would have any material positive impact on subscriber numbers would likely have to be so large as to exacerbate the competitive distortions referred to above.
- 4.56 Having considered the above, ComReg in the Consultation came to the preliminary opinion that it would not appear necessary to provide additional subsidies to maintain marginal users and therefore a deviation from cost in the form of a mark-up or mark down of termination prices is not justified.

Call Externalities

- 4.57 Call externalities arise under a 'Calling Party Pays' (CPP)⁵⁴ regime, as only the calling (retail) party is charged for the call. The recipient of the call likely receives a benefit from answering an incoming call without paying for it. This is known as a "positive externality".
- 4.58 Section 3.2.2 of the AM Consultation Pricing Report referred to the Pigouvian subsidy⁵⁵ which involves adjusting for the positive externality by charging the recipient for answering a call (a subsidy) and reducing the amount the calling party pays. AM recognised the difficulties for ComReg in imposing this in a wholesale calling-party-network-pays regime as it would impose an incoming call retail tariff on the recipient subscribers. ComReg did not consider that this was practical under the current legislative arrangements i.e. ComReg is not in a position to impose this on operators.
- 4.59 Another option suggested by AM to simulate the call externality was to reduce the proportion of the cost paid by the calling party – by way of a mark down of termination charges and allow the recipient network the flexibility on how to recover the remaining cost of the call, related to the call externality using other indirect methods unrelated to specifically answering the call. While this is of relevance at the wholesale level, it is of no relevance at the retail level. Furthermore, it creates the risk of under recovery of costs with consequent under investment referred to above.

⁵⁴ CPP is where the calling party pays for the calls made and nothing for the calls received.

⁵⁵ A Pigouvian subsidy (tax) is one which is directly applied to the activity that generates the external benefits (harm).

- 4.60 ComReg also outlined in the Consultation (see section 4.45) that, given the calling party pays for the call, setting Termination Rates above incremental costs could result in the calling party initiating an inefficiently low number of calls from the receiving party's perspective. As identified above, the called party may derive some benefit from the call as otherwise they would not answer the call.
- 4.61 Having considered the above, ComReg, in the Consultation, was of the preliminary opinion that a pure LRIC methodology potentially goes further than a LRAIC+ methodology in recognising this call externality as the receiving operator can allocate common costs unrecovered from call termination to other services as they see fit. As set out in the Consultation, the customers of the receiving operator will therefore indirectly pay for such costs and thus contribute to the cost of the incoming calls for which they receive a benefit.

Tariff-mediated Externality

- 4.62 A tariff-mediated network externality ('**TMNE**') arises when an operator charges its retail customers lower prices for on-net usage than for off-net usage. This can be positive for on-net users and negative for predominantly off-net users who would likely face higher tariffs.
- 4.63 Section 3.2.2 of the AM Consultation Pricing Report outlined that operator specific TMNEs (and setting higher FTRs/MTRs to support overall cost recovery as a result) are distortive to overall market competitiveness since they encourage closed user group calling to the detriment of market-wide communication. AM for this reason concluded that there is no economic justification for setting FVCT and MVCT rates at levels that support TMNEs.
- 4.64 While ComReg does not regulate retail tariffs, it was of the opinion that the matter is relevant because there is the potential for excessive termination revenues to facilitate a TMNE in a way that distorts competition. Pure LRIC Termination Rates should enable smaller operators to compete more easily with larger operators whereas Termination Rates that exceed incremental cost (such as LRAIC+) can lead to more pronounced TMNEs which may cause inertia in the retail market and make it difficult for smaller operators to win customers from larger operators. This could therefore pose a higher barrier to entry and expansion than under a pure LRIC methodology. Pure LRIC Termination Rates lower the floor for retail pricing of off-net calls which should strengthen the ability of smaller operators to construct competitive packages, leading to a more competitively neutral framework.

- 4.65 Having considered the above, ComReg in the Consultation came to the preliminary opinion that the potential for the distortive effect of a TMNE enhances the argument for prices to be set on an incremental cost basis, specifically pure LRIC. This, in ComReg's preliminary opinion as set out in the Consultation, would facilitate increased competition in fixed and mobile termination markets.

Respondent Views and ComReg's Assessment – Associated Externalities

- 4.66 One Respondent (as summarised in Annex 4 - Paragraph A 4.39 to A 4.41) argued that competitive distortions do not exist, that rates are already currently very low and out of line with other EU countries and that there is no evidence of the impact of marginal increases in rates on the volume of retail calls. ComReg's assessment of these views can be found in Annex 4 - paragraph A 4.68 to A 4.73.
- 4.67 Having considered the Respondent's views and following its assessment, ComReg remains of the opinion that the existence of externalities enhances the argument for prices to be set on an incremental cost basis, specifically pure LRIC.

Relationship to Market Competitiveness and Efficiency

- 4.68 Section 3.2.3 of the AM Consultation Pricing Report discussed market competitiveness. In a perfectly competitive market operators maximise profit at the point where marginal cost equals marginal revenue and within that equilibrium market prices have the property of being allocatively efficient. In such circumstances, where prices equal marginal costs all operators should then earn a "normal profit" (including a reasonable rate of return) or "economic profit".
- 4.69 In principle therefore, first-best pricing, i.e. marginal cost pricing, can be approximated by a pure LRIC price in wholesale voice termination markets. However, termination markets are not perfectly competitive in all aspects due to:
- The existence of product differentials (e.g. network coverage);
 - Termination not being a substitutable product;
 - Economies of scale and scope;
 - Call and network externalities (see Section 4.54 to 4.61 above); and
 - Regulations or capital restrictions/obligations.

- 4.70 AM was of the opinion that a price equal to marginal cost (i.e. first-best pricing) cannot be applied to all quantities produced due to the presence of large fixed costs. An average price approach that recovers all costs e.g. LRAIC+ or LRIC+ can be applied, or an approach where some services are priced at marginal costs (i.e. first-best pricing for those services) is also possible, provided that other services recover the large fixed costs to maintain overall cost recovery. AM did however recognise that where prices increase above marginal cost, call volumes would decline, which could lead to a welfare loss.
- 4.71 AM went on to state that due to the two-sided structure of the voice termination market and with traffic that is largely balanced, most of the common costs that are notionally recovered via LRIC+/ LRAIC+ based Termination Rates are counterbalanced by outpayments to other operators for the recovery of their common costs.
- 4.72 AM, having considered the traffic balances (and some imbalances) together with the fact that call termination is now a minor service in an operator's portfolio, was of the opinion that first-best pricing (approximated by pure LRIC) can be used to price termination traffic without any significant impact on the net financial position of the operators (i.e. both outpayments and revenues for termination decline by a similar amount with either an incremental approach like pure LRIC, or a total cost recovery approach such as LRAIC+ or LRIC+).
- 4.73 Having considered the above, ComReg in the Consultation came to the preliminary opinion that there was no evidence that pure LRIC based MTRs (for example) would have an adverse impact on competition for voice calling.

Respondent Views and ComReg's Assessment – Market Competitiveness and Efficiency

- 4.74 One Respondent (as summarised in Annex 4 - Paragraph A 4.42 to A 4.43) discussed the impact of increasing prices above marginal cost on call volumes, welfare and competition. ComReg's assessment of such comments can be found in Annex 4 - Paragraphs A 4.74 to A 4.76.
- 4.75 Having considered the Respondent's views and following its assessment, ComReg remains of the opinion that there is no evidence that pure LRIC based MTRs would have an adverse impact on competition for voice calling. This view is as set out in Annex 4 – Paragraph A 4.76 and is consistent with the European Commission view that mobile termination rates based on a pure BU-LRIC model contributes to a level playing field among operators by eliminating competitive distortions in termination markets and creating greater consumer benefits⁵⁶.

⁵⁶ <https://ec.europa.eu/digital-single-market/en/news/commission-halts-italian-proposal-set-asymmetrical-termination-rates>

Impact on Relevant Markets

Impact on Relevant Retail Markets

- 4.76 The AM Consultation Pricing Report discussed the impacts price regulation of FTRs and MTRs have on fixed/mobile retail pricing and competition.

Impact on Retail Pricing in the Fixed Market

- 4.77 As MTRs fall, retail prices for calls to mobile should also fall. However the full MTR reduction may not pass through to the customer depending on competition across bundles, call types and contractual terms between operators.
- 4.78 FSPs charge the same retail price for calls to fixed numbers, regardless of who the terminating party is. As identified by AM, this means that there are no material fixed-network TMNEs generated by groups of customers choosing one fixed network over another. This is discussed further in section 3.2.4 of the AM Consultation Pricing Report.

Impact on Retail Pricing in the Mobile Market

- 4.79 The AM Consultation Pricing Report identified that in order for the consumer to benefit from discounted or free on-net calls, the consumers must be on the same mobile network. As regards off-net calls, mobile price plans do not typically differentiate between the price to call off-net mobile numbers and the price to call off-net fixed numbers. AM identified that even though the FTR is currently lower than the MTR, MSPs are not passing the lower FTR onto the consumer in the form of a lower retail tariff to call fixed networks.
- 4.80 Given the continuing increase in the size of bundle packages (with more inclusive minutes and/or data) that are now the standard offerings rather than being high end, AM concluded that MTRs which are currently priced at pure LRIC are no longer a significant barrier to MSPs offering competitive packages with unlimited off-net voice bundles.

Impact on Competition

- 4.81 This section sets out the impact of Termination Rates on the level of competition in the fixed and mobile markets. This is discussed under the following headings:
- Impact of MTR and FTR regulation on Mobile Competition
 - Impact of MTR and FTR regulation on Fixed Competition
 - Impact of MTR and FTR regulation on Fixed-Mobile Competition

- 4.82 ComReg is required to ensure that there is no distortion or restriction of competition with a view to promoting the interests of users in terms of price, choice and quality of service. It can however be argued that Termination Rates create a floor to retail pricing. If Termination Rates exceed an efficient level of cost, difficulties will arise for carriers to offer flat-rate calling plans involving off-net calls due to the uncertainty regarding the level of customer take-up of such plans. Reducing Termination Rates to the efficient cost on the other hand will provide Service Providers with greater scope for developing new retail packages (as lower wholesale costs will reduce their exposure in the event of increased usage at the retail level).

Impact of MTR and FTR Regulation on Mobile Competition

- 4.83 AM in section 3.24 of the AM Consultation Pricing Report referred to the work of Genakos and Valetti⁵⁷, where it identifies that the nature of mobile competition is oligopolistic.
- 4.84 In the past when MTR rates were higher, one of the observed profit maximising approaches used by MSPs was to set MTRs and retail off-net charges above cost and to discriminate between retail prices for on-net and off-net calls. Such price discrimination generates TMNEs resulting in a competitive advantage for larger Service Providers and a potential reduction in competition. TMNEs can reinforce barriers to entry/expansion and put smaller MSPs at a disadvantage in offering outgoing call services given their asymmetric position and initial significant off-net traffic while benefitting networks with a larger customer base. ComReg was of the preliminary opinion that low MTRs alleviate this.
- 4.85 In addition, higher MTRs for smaller MSPs could also help the larger MSPs to justify higher off-net retail tariffs, reinforcing TMNEs further. ComReg was of the preliminary opinion that symmetric MTRs alleviate this.
- 4.86 AM anticipates a low impact on mobile competition of changes to FTRs given MSPs do not often offer lower prices for calls to fixed networks. The difference between the impact of FTRs on MSPs and the impact of MTRs on FSPs can be attributed to the relative importance of the Termination Rates within their cost bases. This is discussed further in the AM Consultation Pricing Report in Figure 3.11.

⁵⁷ Testing the “Waterbed” Effect in Mobile Telephony; Genakos and Valetti; 2008.

Impact of MTR and FTR Regulation on Fixed Competition

- 4.87 Although MTRs have no direct impact on fixed competition (as all FSPs pay the same MTR to any given MSP), there is an indirect impact. As set out in the AM Consultation Pricing Report, this indirect impact arises from the way in which MTRs can constrain what FSPs can do on the retail side.
- 4.88 Although it is difficult to predict the precise impact on retail prices, MTRs based on BU-LRIC help ease barriers to creating packages with off-net mobile calls which may promote retail competition. These points were also reflected in section 3.2.4 of the AM Consultation Pricing Report.
- 4.89 Just like an MSP, an FSP has profit-maximisation incentives to set its FTRs at high levels. NRAs have therefore found it necessary to intervene in setting FTRs in order to address such competition problems.
- 4.90 AM identifies that setting FTRs at pure LRIC (with no mark-up for common costs) could impact the incumbent if they also face *ex-ante* regulation on wholesale origination in the form of cost orientation. For its wholesale call origination customers, the incumbent would have little or no opportunity to recover common costs from retail services. This would therefore allow a Service Provider to purchase wholesale origination and termination services from the incumbent without contributing to common costs unrecovered from LRIC FTRs. This was discussed further in section 3.2.4 of the AM Consultation Pricing Report.

Impact of MTR and FTR Regulation on Fixed-Mobile Competition

- 4.91 AM identified that in the past it was claimed that high MTRs have adversely affected fixed customers and operators and damaged competition between fixed and mobile operators. MTRs based on BU pure LRIC have facilitated fixed-mobile competition.

Respondent Views and ComReg's Assessment – Impact on Relevant Markets

- 4.92 One Respondent addressed comments made by ComReg with regard to price changes on relevant markets (see Annex 4 Paragraph - A 4.44 to A 4.46) and questioned the impact of current and lower Termination Rates on markets, consumer offerings and competition. ComReg's assessment of such comments can be found at Annex 4 Paragraph - A 4.77 to A 4.85, where it concludes that if rates based on LRIC have been shown to confer benefits then lower rates would at least confer those same benefits and could be expected to lead to an improvement in those benefits.

Regulatory Best Practice – Choice of Increment

- 4.93 Regulatory best practice in the choice of the increment was discussed in Section 3.2.5 of the AM Consultation Pricing Report. It identified that ComReg's existing pricing decisions for FVCT/MVCT comply with the 2009 Termination Rates Recommendation and use a BU pure LRIC approach.
- 4.94 The 2009 Termination Rates Recommendation requires that:
- "NRAs should set termination rates based on the costs incurred by an efficient operator. This implies that they would also be symmetric."*
- 4.95 It goes on to recommend:
- ".... that the evaluation of efficient costs is based on current cost and the use of a bottom-up modelling approach using long-run incremental costs (LRIC) as the relevant cost methodology."*
- 4.96 BEREC in its study 'Termination Rates at a European Level' as of July 2018 identified that of the 28 EU countries, three do not apply a BU pure LRIC /benchmarking approach for FTRs and only one does not apply the same approach for MTRs - See Table 9 and Table 10 below.
- 4.97 ComReg has to ensure that the approach chosen contributes to the development of the internal market. As set out in the AM Consultation Pricing Report, AM was of the opinion that this is best achieved by Ireland having a similar pricing regime as most other EU Member States, so as not to distort the market for wholesale services in Ireland versus other Member States, nor to (dis)advantage consumers in Ireland and other Member States. ComReg agreed with AM's view and was of the preliminary opinion that this could be achieved by the use of LRIC to set symmetric Termination Rates in Ireland.
- 4.98 Figures 5 and 6 of the Consultation has been updated in Table 9 and Table 10 below to reflect more up to date information (i.e. at July 2018).

Table 9: Regulatory Models Applied to Determine FTRs

Member State		FTR Cost Accounting Model	Methodology
AT	Austria	Pure LRIC	BU
BE	Belgium	FDC/FAC	
BG	Bulgaria	Pure LRIC	BU
CY	Cyprus	Pure LRIC	BU
CZ	Czech Republic	Pure LRIC	BU
DE	Germany	Pure LRIC	BU - Benchmark
DK	Denmark	Pure LRIC	BU
EE	Estonia	Pure LRIC	BU - Benchmark
EL	Greece	Pure LRIC	BU
ES	Spain	Pure LRIC	BU
FI	Finland		FDC
FR	France	Pure LRIC	BU
HR	Croatia	Pure LRIC	BU
HU	Hungary	Pure LRIC	BU
IE	Ireland	Pure LRIC	BU
IT	Italy	Pure LRIC	BU
LT	Lithuania	Pure LRIC	BU
LU	Luxembourg	Pure LRIC	BU
LV	Latvia	Pure LRIC	BU - Benchmark
MT	Malta	Pure LRIC	BU
NL	Netherlands	Pure LRIC	BU
PL	Poland	n/a	n/a
PT	Portugal	Pure LRIC	BU
RO	Romania	Pure LRIC	BU
SE	Sweden	Pure LRIC	BU
SI	Slovenia	Pure LRIC	BU
SK	Slovak Republic	Pure LRIC	BU
UK	United Kingdom	LRIC	BU

Source: BEREC Report BoR (18) 218, 'Termination rates at European Level' July 2018 (dated 6 December 2018), Annex 3, Table 4.

Table 10: Regulatory Models Applied to Determine MTRs

Member State		MTR Cost Accounting	Methodology
AT	Austria	Pure LRIC	BU
BE	Belgium	Pure LRIC	BU
BG	Bulgaria	Pure LRIC	BU
CY	Cyprus		Benchmark
CZ	Czech Republic	Pure LRIC	BU
DE	Germany	Pure LRIC	BU
DK	Denmark	Pure LRIC	BU
EE	Estonia	LRIC	BU - Benchmark
EL	Greece	Pure LRIC	BU
ES	Spain	Pure LRIC	BU
FI	Finland	Other (FDC/FAC)	
FR	France	Pure LRIC	BU
HR	Croatia	Pure LRIC	BU
HU	Hungary	Pure LRIC	BU
IE	Ireland	Pure LRIC	BU
IT	Italy	Pure LRIC	BU
LT	Lithuania	LRIC	BU- Benchmark
LU	Luxembourg	Pure LRIC	BU
LV	Latvia	BU LRIC	Benchmark
MT	Malta	Pure LRIC	BU
NL	Netherlands	Pure LRIC	BU
PL	Poland	Pure LRIC	BU
PT	Portugal	Pure LRIC	BU
RO	Romania	LRIC	BU- Benchmark
SE	Sweden	Pure LRIC	BU
SI	Slovenia	Pure LRIC	BU
SK	Slovak Republic	Pure LRIC	BU
UK	United Kingdom	Pure LRIC	BU

Source: BEREC Report BoR (18) 218, 'Termination rates at European Level' July 2018 (dated 6 December 2018), Annex 8, Table 8.

Respondent Views and ComReg's Assessment – Regulatory Best Practice

4.99 No Respondents provided comments on this section.

ComReg's Assessment of Respondents Views on Question 2

4.100 In the Consultation, ComReg asked whether cost orientation by means of a pure LRIC methodology is the most appropriate approach to set Termination Rates in Ireland.

- 4.101 Three of the four Respondents to the Consultation responded to this question, with one Respondent replying in detail to each of the factors discussed – see above at 4.33. Respondents' views are summarised in Annex 4 - Paragraph A 4.33 to A 4.46 and ComReg's assessment of those views are set out in paragraphs A 4.48 to A 4.81.
- 4.102 One Respondent believes that ComReg had neglected to take into account the regulatory objective of encouraging efficient investment, see paragraph A 4.38. ComReg has assessed this comment in paragraphs A 4.61 to A 4.65. The impact on investment has also been considered in detail in the RIA. ComReg is of the opinion that when considering the setting of Termination Rates, the impact on investment in the whole market should be taken into consideration. ComReg considers that pure LRIC based Termination Rates have two key impacts on investment. One is that net payers of termination charges pay only for efficiently incurred costs. As a result those Service Providers have extra resources to invest. The second impact of pure LRIC based Termination Rates is that over the lifetime of a ComReg Decision, Service Providers have an incentive to invest to reduce their cost levels for providing call termination to below the rates determined for the ComReg Decision.
- 4.103 Two Respondents raised concern around the recovery of unrecovered costs (i.e. common and joint costs). Respondents' views are summarised in Annex 4 - Paragraph A 4.87 to A 4.92.
- 4.104 One Respondent stated that it is imperative that it is allowed to recover all of its efficiently-incurred fixed and common costs. It goes on to state that neither the Consultation nor the AM Consultation Pricing Report gives clarity as to where such costs ought to be recovered from. This, in the Respondent's opinion, leaves open the prospect of stranded costs which is detrimental to this operator being able to compete fairly in the various regulated markets.
- 4.105 The second Respondent stated that a pure LRIC approach will inevitably lead to an under-recovery of costs which ultimately leads to a distortion of market forces and existing market equilibria.
- 4.106 ComReg's assessment of the comments received relating to the issue of the recovery of unrecovered costs is set out in Annex 4 – Paragraph A 4.93 to A 4.103. In the case of MNOs, MTRs are the only regulated service and so MNOs can recover any unrecovered costs from their other unregulated services. ComReg is of the view that efficient costs unrecovered from Eircom's voice termination services could be recovered from other (regulated and unregulated) wholesale and/or retail voice/non-voice services as appropriate.

ComReg's Final Position - Question 2

4.107 Further to ComReg’s assessment of Respondents’ views, ComReg’s final position is that cost orientation by means of a pure LRIC methodology is the most appropriate approach to set Termination Rates in Ireland.

4.3 Economic Cost Recovery

4.108 Costs can be recovered over the lifetime of a model in numerous different ways hence the depreciation method is a key factor in determining the level of costs to be recovered each year. Section 5.2 of the AM Consultation Pricing Report noted that there are four main types of depreciation methods for determining the recovery of capital investments, as described in the following Table 11:

Table 11: Types of Depreciation

Type of depreciation	Subtype	Description
Historical cost accounting (HCA)		The capex recorded in the fixed asset register (the gross book value, GBV) is depreciated over the defined financial lifetime of the asset, usually with a constant depreciation charge per annum
Current cost accounting (CCA)	Operating capital maintenance (OCM)	Seeks to maintain the operating or output capacity of the asset
	Financial capital maintenance (FCM)	Seeks to maintain the value of the original capital investment
Annuities	Standard annuity	An annualised cost is derived to allow for full recovery of both the investment and the capital employed, at a constant level per year.
	Tilted annuity	An annualised cost is derived to allow for full recovery of both the investment and the capital employed, with the recovery tilted according to the forecast price trend of the asset
	Modified tilted annuity	An annualised cost is derived to allow for full recovery of both the investment and the capital employed, with the recovery tilted according to the forecast price trend of the asset, with an adjustment to reflect constant changes in economic output over time
Economic depreciation		<p>Takes into account all the underlying factors that influence economic value, i.e.:</p> <ul style="list-style-type: none"> projected trends in the opex of the asset projected trends in replacing the asset with its modern equivalent unit the output generated by the asset (i.e. demand)

Source: AM Consultation Pricing Report, Figure 5.3

4.109 Accounting depreciation methods such as HCA and CCA distribute the costs of an investment in a systematic manner over the life of an asset. However, this means that the resulting annuities do not evolve in a smooth way and this can be problematic for setting cost oriented prices, particularly when asset prices are changing over time.

- 4.110 The standard annuity approach consists of calculating an annual charge – the annuity – which is identical (although the balance between depreciation charge and cost of capital charge will vary between years) every year and is aligned to the cost recovery criteria. The standard annuity approach therefore calculates an increasing depreciation charge and a decreasing return on capital employed as the annuity remains stable over time. This method is appropriate when asset prices and the volume of output produced by the assets is stable over time (i.e. no material change over time).
- 4.111 The tilted annuity approach is probably the most widespread depreciation approach used for regulatory purposes. It incorporates a tilt which enables the calculation of annuities to evolve in line with asset price changes: if an asset price increases by 5 per cent per annum, annuities will also increase with 5 per cent per annum. This method is appropriate therefore when asset prices are changing by a constant percentage and the volume of output produced by the assets is stable over time (i.e. no material change over time).
- 4.112 The tilted annuity approach sends appropriate ‘build or buy’ signals to market players and replicates the annual charges an operator would face in a competitive market. The tilted annuity approach allows for a smooth evolution of annual costs despite price changes and investment cycles. At the end of the useful life of an asset, i.e. when the asset needs to be renewed, the annuities calculated with the tilted annuity method will be similar just before and just after the renewal of the asset. Therefore, annuities evolve without the discontinuities which are the case of the standard annuity approach.
- 4.113 The modified (adjusted) tilted annuity modifies the tilted annuity formula to compute annuities which take into account the evolution of the volume of output produced by the assets. It does so, for example, by recognising the average/constant change in economic output over a period of time. This method is therefore appropriate when asset prices and volumes of outputs produced by the assets are changing by a constant (or almost constant) percentage.
- 4.114 The economic depreciation approach modifies the tilted annuity formula in order to compute annuities which take into account the evolution of the output produced by the assets. This approach uses the same formula as in the tilted annuity, except that instead of a constant total annuity, a constant unit annuity is used (and the total annuity varies with the number of outputs). The annuity in this approach varies with the number of outputs produced by the assets and with the price trend. When the asset produces a low number of outputs (for example, in early years of a new service when there are few customers), then the total annuity is low at first and subsequently increases when the number of outputs produced increases.

4.115 This method is therefore appropriate when asset prices and the volume of output produced by the assets is fluctuating from year to year.

4.116 Table 12 below summarises the factors which determines the choice of appropriate depreciation method.

Table 12: Factors affecting choice of Depreciation Method

Depreciation Method	Change in Asset Prices	Change in Demand
Standard Annuity	Stable	Stable
Tilted Annuity	Constant Change	Stable
Modified (Adjusted) Tilted Annuity	Constant Change	Constant Change
Economic Depreciation	Fluctuating	Fluctuating

4.117 AM assessed the suitability of all the depreciation approaches for informing cost-oriented prices – see Table 13 below.

Table 13: Factors Considered by each Depreciation Method

Aspect	HCA	CCA	Standard annuity	Tilted annuity	Modified tilted annuity	Economic depreciation
MEA cost today		✓	✓	✓	✓	✓
Forecast MEA cost				✓	✓	✓
Output of network over time					✓ ⁵⁸	✓
Financial asset lifetime	✓	✓	✓	✓	✓	✓ ⁵⁹
Economic asset lifetime			✓	✓	✓	✓

Source: AM Consultation Pricing Report, Figure 5.4

4.118 While the AM Consultation Pricing Report identified that only the modified tilted annuity and economic depreciation approaches consider all potentially relevant factors for setting cost oriented prices, it recognised that other annuity approaches e.g. tilted annuity can generate a similar depreciation profile, particularly when the year-on-year change in output is stable and asset prices are changing by a constant percentage from year to year.

⁵⁸ An approximation for output changes over time (with a compound annual growth rate of x%) can be applied in a tilted annuity by assuming an additional output tilt factor of x% per annum.

⁵⁹ Economic depreciation can use financial asset lifetimes, although strictly it should use economic lifetimes (which may be shorter, longer or equal to financial lifetimes).

- 4.119 Recital 18 of the 2009 Termination Rates Recommendation states a preference for economic depreciation, although it does not prohibit the use of the other methods, provided that the depreciation profile of each major asset is examined separately in each case.
- 4.120 The economic depreciation approach does however require forecasts of the outputs produced over a long time period and so, as a consequence, could be more subjective than other methods, but it depends on how the development path is expected to evolve, and may be a more complex method to implement. However, it tends to give better economic signals than other depreciation methods when the number of outputs produced by an asset is not stable and expected to change significantly over the forecast period.
- 4.121 ComReg, having considered the views of AM, and the Termination Rates Recommendation, was of the preliminary opinion that the economic depreciation approach is appropriate for the MVCT market. This in ComReg's opinion was appropriate given that this market is capital intensive, will continue to be subject to significant changes in asset prices and is expected to experience considerable growth in service demand over the period of the proposed model.
- 4.122 The use of economic depreciation in the proposed BU pure LRIC Model will ensure that the pure LRIC for MVCT will represent the economic value of the network resources that the hypothetically efficient operator could avoid if it didn't have to provide MVCT. This approach considers service volumes and costs across the lifetime of the proposed BU pure LRIC Model to ensure that the operator is able to recover all relevant costs in an economically efficient manner. In effect, this means that costs are depreciated more when the network and its elements are used more intensively and vice versa.
- 4.123 Under the economic depreciation approach, the algorithm assumes that the PV (present value) of expenditures equates to the PV of revenues over the time horizon of the proposed BU pure LRIC Model. It does this by considering not just the trends in operating and capital expenditure associated with the assets, but also the levels of economic output that can be generated by those assets over the time horizon of the proposed BU pure LRIC Model. This methodology therefore better aligns the attribution of cost over time in line with the usage of the network, particularly in the presence of large scale up-front investment in anticipation of future capacity needs. This leads to the fundamental equation of the economic depreciation calculation that is:

$$PV (\text{expenditures}) = PV (\text{unit cost} \times \text{output})$$

where "unit cost × output" is representative of the cost-oriented revenues that can be generated by the operator.

- 4.124 As regards the Relevant FVCT Markets, ComReg was of the preliminary opinion that the pure incremental cost of terminating a fixed call is likely to be quite small, with capital costs generally not varying under the different methodologies. The impact of the depreciation approach chosen is therefore not likely to be material.
- 4.125 ComReg, having considered the views of AM, and the 2009 Termination Rates Recommendation, was of the preliminary opinion that depreciation determined on the basis on a tilted annuity approach is appropriate for the FVCT market given that the change in demand is likely to be small and the tilt would reflect price changes in assets.
- 4.126 TERA was of the opinion that tilted annuities implemented in the model are a good proxy for economic depreciation in the context of a mature network and as demand is not forecasted to follow any significant take-up.
- 4.127 This approach has also been consistently applied by ComReg for modelling the Eircom core network services (voice, broadband, TV and leased lines services).
- 4.128 The annuity formula implemented by TERA in the proposed FTR cost model was as follows:

$$A_1 = \frac{I}{(1+w)^{T+\frac{1}{2}}} \times \left[\frac{w-P}{1 - \left(\frac{1+P}{1+w}\right)^N} \right]$$

Where:

- A₁, the annual charge in year one (used for price calculation)
- I, the investment value of the asset
- w, the cost of capital (parameter)
- P, the real annual change in the price of the asset
- N, the useful life of the asset
- T, the average payment term

ComReg's Assessment of Respondents' Views on Question 3

- 4.129 In the Consultation, ComReg sought views from interested parties as to the appropriateness of the economic depreciation approach for the MVCT markets and the tilted annuity approach for the FVCT market.

4.130 Two of the four Respondents to the Consultation responded to this question, with one Respondent recommending a consistent approach for both markets (i.e. the tilted annuity approach) thereby avoiding the complexities associated with the economic depreciation approach. The other Respondent expressed concern with the output of the model given its dependency on a number of key assumptions. Respondents' views and ComReg's assessment of those views are summarised in Annex 4 - Paragraph A 4.107 to A 4.113.

ComReg's Final Position - Question 3

4.131 Having considered the view of Respondents, ComReg's final position is that an economic depreciation approach for the MVCT market and a tilted annuity approach for the FVCT market are appropriate to determine pure LRIC MTRs and FTRs respectively.

4.4 Network Nodes

BU Model for MVCT markets

4.132 BU Models estimate the costs of building an operator's network using modern technology. Mobile networks for example can be considered as a series of nodes (with different functions) and links between them. When developing a deployment algorithm for these nodes, it is necessary to consider whether the algorithm accurately reflects the actual number of nodes deployed. Allowing an MTR model to deviate from the operators' actual number of nodes may be justified in the situation where the operators' network is not viewed as efficient or modern in design. Bearing the above in mind ComReg considered the following options for the network topology:

- Actual network;
- Scorched earth;
- Scorched node; and
- Modified scorched node.

4.133 An actual network approach uses the existing network nodes of a real operator. However, ComReg's preliminary view was that BU Models for hypothetical efficient existing operators for the FVCT and MVCT markets should be developed. An actual operator's node location may not necessarily be representative of such a hypothetical efficient operator.

- 4.134 A scorched earth approach makes no reference to actual network layouts and so applies no constraints on the number, location or configuration of nodes to be dimensioned. Instead, the scorched earth approach assumes that the required equipment quantities can be deployed at locations optimal to the overall network design, as if the network was being designed on a greenfield site.
- 4.135 As such, the results of this methodology are driven purely by the defined dimensioning rule set and the area to be covered. The resulting dimensioning would imply the most theoretically efficient network design to an extent that it may not closely resemble the actual network layout that even an efficient operator would be practically capable of deploying.
- 4.136 A scorched node approach is one that recognises the historical evolution of the actual networks that have been deployed by the existing operators. This method uses the historic location of network nodes, but allows for example the new MTR model network design to deploy the appropriate technology and network configuration to make efficient use of these nodes.
- 4.137 As an operator rolls out a network, the location of network nodes will be dictated mainly by factors such as the level and extent of coverage the operator is trying to achieve and by forecasts of demand for services the network is expected to support; it will also, to some extent, be constrained by the availability of suitable sites and by topological constraints such as the geographical terrain the network is going to serve.
- 4.138 Consequently, as the operator develops a network over time there are a number of real world factors that often limit the extent that an existing network can be considered truly optimal for the current or anticipated conditions in the market.
- 4.139 A scorched node approach assumes that the historical locations of the actual network node buildings are fixed, and that the operator can choose the best technology to configure the network at and between these nodes to meet the optimised demand of an efficient operator. For example, this could mean replacing legacy equipment with best-in-service equipment.
- 4.140 The scorched node approach, therefore, determines the efficient cost of a network that provides the same services as the incumbent network, taking as given the current location and function of the incumbent's nodes. The main concern with this approach is that there could be embedded inefficiencies associated with the existing network design.

4.141 The modified scorched node approach attempts to address the shortcomings inherent in the other approaches by modifying the scorched node principle in order to replicate a more efficient network topology than that currently in place. Consequently, this approach takes the existing topology so as to maintain the linkage with actual node information provided by operators, as part of SIRs, whilst also having the flexibility of selecting the appropriate efficient network specification and technologies.

4.142 AM noted in the MTR Consultation Specification Document that:

“The modified scorched-node approach dimensions a hypothetical network that is comparable to actual operator node counts, whilst ensuring that the network design is modern and reasonably efficient, reflecting for example the modern approach to deploying equipment functionality at different nodes in the network⁶⁰”.

4.143 The ERG (European Regulators Group) has stated that:

“It can be appropriate to modify the scorched node approach in order to replicate a more efficient network topology than is currently in place. Such a modified scorched node approach could imply taking the existing topology as the starting point, followed by the elimination of inefficiencies. This may involve changing the number or types of network elements that are located at the nodes to simplify and decrease the cost of the switching hierarchy. Other important issues in this respect are how to deal with spare capacity in the network and the existence of stranded costs. When the modified scorched node approach is not applicable because the elimination of inefficiencies is not practical, it could be more appropriate to use a scorched earth approach.”⁶¹

4.144 In light of the above discussion and given that the 2016 MTR Pricing Decision adopted a modified scorched-node approach, ComReg, as set out in the Consultation was of the preliminary opinion that the proposed MTR cost model should be based on data provided by MSPs using a modified scorched node approach. This, in ComReg’s preliminary opinion, allows for the modelling of 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 currently in the Irish market.

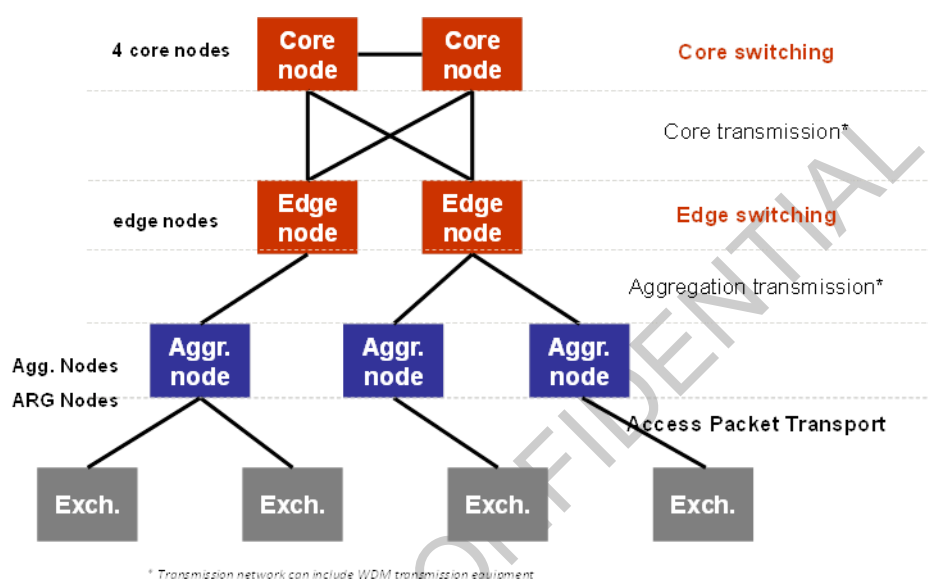
⁶⁰ See Section 3.2 of ComReg document 18/19c.

⁶¹ ERG (05) 29 “ERG COMMON POSITION: Guidelines for implementing the Commission Recommendation C (2005) 3480 on Accounting Separation & Cost Accounting Systems under the regulatory framework for electronic communications”, http://berec.europa.eu/doc/publications/consult_accounting_sep/erg_05_29_erg_cp_rec_as_and_cas_final.pdf

BU Model for FVCT markets

4.145 As regards the proposed cost model for FTRs, ComReg, as set out in the Consultation, was of the preliminary opinion that the network topology should be based on a scorched node approach. The network would therefore be modelled based on Eircom's current deployment of NGN nodes as set out in Figure 4: Overview of Eircom's NGN' below. ComReg was of the opinion that this is representative of an efficient network topology over which fixed voice will be delivered over the next few years and beyond.

Figure 4: Overview of Eircom's NGN



Source: FTR Consultation Specification Document, Figure 1

4.146 For further discussion of this topic, please see the MTR Consultation Specification Document and the FTR Consultation Specification Document.

ComReg's Assessment of Respondents' Views on Question 4

4.147 In the Consultation, ComReg sought views from interested parties as to the appropriateness of a modified scorched node approach for the modelling of mobile networks.

4.148 Two of the four Respondents to the Consultation responded to this question with one Respondent agreeing with the choice of the modified scorched node approach for the modelling of mobile networks and the other Respondent stating that it has no observation to make regarding this topic at that time. Respondents' views and ComReg's assessment of those views are summarised in Annex 4 - Paragraph A 4.117 to A 4.119.

ComReg's Final Position - Question 4

4.149 Having considered the views of Respondents, ComReg's final position is that a modified scorched node approach is appropriate for the modelling of mobile networks.

ComReg's Assessment of Respondent Views of Question 5

4.150 In the Consultation, ComReg sought views from interested parties as to the appropriateness of a scorched node approach for the modelling of fixed networks.

4.151 Two of the four Respondents to the Consultation responded to this question with one Respondent agreeing with the choice of the scorched node approach for the modelling of fixed networks and the other Respondent stating that it has no observation to make regarding this topic. Respondent views and ComReg's assessment of those views are summarised in Annex 4 - Paragraph A 4.123 to A 4.125.

ComReg's Final Position - Question 5

4.152 Having considered the views of Respondents, ComReg's final position is that a scorched node approach is appropriate for the modelling of fixed networks.

4.5 Symmetry of Termination Rates

4.153 The 2009 Termination Rates Recommendation recommends that NRAs set Termination Rates based on the costs incurred by an efficient operator. The 2009 Termination Rates Recommendation states that this implies that the termination rates would also be symmetric.

4.154 The 2009 Termination Rates Recommendation proposes that any determination of efficient cost levels that deviates from the principles set out in the Recommendation i.e., any permitted asymmetry, should be justified by objective cost differences which are outside of the control of the operators concerned. This could be due to uneven spectrum assignments in the mobile termination markets or a new mobile entrant incurring higher per-unit incremental costs where it has been determined that there are impediments on the retail market to market entry and expansion.

4.155 In Slovakia, the regulator in September 2017 proposed that new entrant mobile operators should have an MTR 10% higher than for other operators. This proposal was however challenged by the European Commission.

- 4.156 BEREC in its report 'Termination rates at European Level' July 2018 (dated 6 December 2018), identified that of the 28 Member States (identified above – see Table 9), 25 apply FTR symmetry of rates and only three⁶² apply it partially.
- 4.157 In the Market Review Consultation, ComReg proposed to designate two mobile virtual network operators ('**MVNOs**'), Virgin Media Ireland Limited and Carphone Warehouse Ireland Mobile Limited (trading as ID Mobile) with SMP for the first time. ID Mobile has since ceased trading. ComReg in the Market Review Decision is designating Virgin Media Ireland Limited with SMP in MVCT in addition to re-designating the five MSPs already so designated with SMP (i.e. Meteor Mobile Communications Limited (trading as eir Mobile); Lycamobile Ireland Limited; Tesco Mobile Ireland Limited; Three Ireland (Hutchison) Limited; and Vodafone Ireland Limited).
- 4.158 In addition to the seven FSPs already designated with SMP in FVCT (i.e. BT Communications Ireland Limited; Colt Technology Services Limited, Eircom Limited, Magnet Networks limited; Virgin Media Ireland Limited; Viatel Ireland Limited⁶³ and Verizon Ireland Limited, ComReg has designated an additional 15 FSPs with SMP for the first time in the Market Review Decision as set out in Table 14 below.

⁶² Luxembourg, Poland and Finland (in Finland the three biggest operators have symmetric termination rates and the rest of the operators have different rates).

⁶³ Viatel was not designated with SMP in the 2007 FVCT Decision. However, Smart Telecom was designated with SMP pursuant to the 2007 FVCT Decision. Digiweb acquired Smart Telecom in December 2009, and Digiweb then merged with Viatel in 2013.

Table 14: Newly Designated SMP FSPs

Newly Designated SMP FSPs	
1	Airspeed Communications Unlimited
2	Blue Face Limited
3	Dialoga Servicios Interactivos, SA
4	Equant Network Systems Limited
5	Finarea SA
6	Imagine Communications Ireland Limited
7	In2com Limited
8	Intellicom Ireland Limited
9	Internet Protocol Telecom Limited ⁶⁴
10	Magrathea Telecommunications (Ireland) Limited
11	Modeva Networks Unlimited
12	Plannet 21 Communications Limited
13	Telcom Ltd
14	Vodafone Ireland Limited
15	Voxbone SA

4.159 As set out in section 6.1 of the AM Decision Report, articles 9 and 10 of the 2009 Termination Rates Recommendation offer some limited flexibility for new mobile entrants to benefit from higher termination charge during a transitional period but with the caveats that:

- Any such period should not exceed four years after market entry;
- The NRA determines there are impediments in the retail market to market entry and expansion;

⁶⁴ IP Telecom has a fixed number allocation but does not currently supply FVCT. It has negotiated, or has concrete plans to negotiate, interconnection with relevant wholesale partners, including FTRs to be applied, and has formal plans regarding prospective wholesale and/or retail activity.

- exogenous factors are identified giving rise to objective cost differences.
- 4.160 While asymmetric termination rates can, in ComReg's opinion, assist in the expansion of smaller operators and new entrants, they could however lead to on-net off-net pricing differentiation which could have a negative impact on competition.
- 4.161 In the Consultation, ComReg was of the preliminary opinion that symmetric Termination Rates create a level playing field which removes impediments to competition (i.e. operators no longer risk incurring higher Termination Rates charged by competing operators). ComReg recognised that pure LRIC symmetric Termination Rates should promote competition for the benefit of efficient operators as it prevents inefficient operators from recovering inefficiently incurred costs from their competitors through Termination Rates. This will also, in ComReg's preliminary opinion, provide broad benefits to consumers (i.e. by promoting efficiency and competition).
- 4.162 ComReg was therefore of the preliminary view that Termination Rates should be set based on the costs incurred by an efficient operator and hence will be symmetric. ComReg took this view having considered whether there was any justification for differentiating between operators, as discussed above.

ComReg's Assessment of Respondent Views of Question 6

- 4.163 In the Consultation, ComReg sought views from interested parties as to whether regulated maximum Termination Rates should be symmetric.
- 4.164 Two of the four Respondents to the Consultation responded to this question. While one Respondent stated that it had no observations to make, the second Respondent stated that any proposal to deviate from symmetry supplies incentives to game the decision by managing the criteria where symmetry would not apply. This Respondent goes on to state that this is consistent with the approach followed generally across the EU and for reasons of practicality, stability and predictability of outpayments for fixed and mobile calling, symmetry should apply. Respondents' views and ComReg's assessment of those views are summarised in Annex 4 - Paragraph A 4.131 to A 4.136.

ComReg's Final Position - Question 6

- 4.165 Having considered the views of Respondents, ComReg is of the final position that regulated maximum Termination Rates should be symmetric.

4.6 Consistency in Approaches for FVCT and MVCT

4.166 Section 6 of the AM Consultation Pricing Report identified a need for consistency of treatment between FVCT and MVCT, particularly with regard to: symmetry; dynamic efficiency; voice market forecasting; treatment of common costs not recovered under pure LRIC; price path; and model updating. These are discussed in turn below

Symmetry

4.167 Symmetry is discussed in section 4.5 above.

Dynamic efficiency

4.168 Several major technological improvements are likely to be implemented over the period for which FTRs and MTRs have been provisionally estimated e.g. LTE⁶⁵, voice over LTE ('VoLTE')⁶⁶, single radio access network ('S-RAN')⁶⁷ equipment for mobile networks, and next-generation access networks and voice over Internet Protocol ('VoIP') for fixed networks. Section 6.2 of the AM Consultation Pricing Report stated that such innovations (to the extent that they can be quantified) should be reflected in the MTR and FTR cost models. They do however recognise that it is important that assumptions are realistic and should not for example cause market distortions or be detrimental to consumer welfare.

Voice market forecasting

4.169 Section 6.3 of the AM Consultation Pricing Report recommended the use of a single voice market forecast for both MTR and FTR models. This will ensure that, for example, fixed voice origination volumes to mobile users included in the FTR model is consistent with voice termination volumes from fixed users in the MTR model.

Treatment of common costs not recovered under pure LRIC

4.170 Common costs are costs which are not directly incurred in the provision of a service but are common to two or more services.

4.171 A pure LRIC approach excludes a mark-up for common costs which would be incurred whether or not the wholesale voice call termination service is provided. This approach is consistent with the 2009 Termination Rates Recommendation.

⁶⁵ Long-Term Evolution (LTE) is a standard for high-speed wireless communication for mobile devices and data terminals, based on the GSM/EDGE and UMTS/HSPA technologies. LTE may be regarded as an implementation of the 4G mobile standard.

⁶⁶ Voice over Long-Term Evolution is voice calls over a 4G LTE network.

⁶⁷ Single Ran (S-RAN) refers to base stations that provide 2G and/or 3G and/or 4G functionality.

- 4.172 A LRAIC+ approach includes a mark-up for the common costs. The cost under this approach is typically higher than under a pure LRIC approach
- 4.173 In order to assess the materiality of such costs, Section 6.4 of the AM Consultation Pricing Report recommended that the FTR model and MTR model should also calculate the LRAIC+ of termination services.
- 4.174 ComReg was of the preliminary view that FSPs and MSPs, other than Eircom, can allocate common costs not recovered through Termination Rates to other services as they see fit. In the case of Eircom as an FSP, ComReg was of the preliminary view that these costs may need to be recovered, at least in part, from other regulated services. The Consultation document stated that this topic would be considered under other price-setting exercises. ComReg reviewed Eircom's historic accounts and the impact of FTRs based on LRIC would have as opposed to FTRs based on LRAIC+. Having considered the views of interested parties, ComReg is of the view that efficient costs unrecovered from Eircom's voice termination services could be recovered from other (regulated and unregulated) wholesale and/or retail voice/non-voice services as appropriate.

Price path

- 4.175 This is discussed in this Decision under Section 5.3.8 for FTR rates and Section 5.4.7 for MTR rates. AM is of the opinion that pricing MVCT using the same structure as FVCT is not appropriate as it is likely to increase operators' costs in their wholesale billing structure and most mobile network costs are minute rather than call driven. As set out in Sections 5.3.8 and 5.4.7, ComReg is of the opinion that a combination of per call and per minute or a pure per minute rate could be used for FVCT while a per minute basis should be used for MVCT.
- 4.176 Options for setting Termination Rates are discussed in Section 6.5 of the AM Consultation Pricing Report. The Report recommended using unaveraged costs for individual years as the starting points for FVCT/MVCT in those years. This is consistent with ComReg's existing pricing decisions.

Model updating

- 4.177 In Section 6.6 of the AM Consultation Pricing Report it is recommended that an update of the MTR/FTR cost models should only occur if there is evidence of significant divergence of model inputs and assumptions from reality which leads to a material change in the results.
- 4.178 Having considered the information available to ComReg, including the views of AM in its AM Consultation Pricing Report, the Consultation set out ComReg's preliminary opinion that the FTR and MTR models should:
- Reflect technological improvements over the regulatory control period;

- Use single voice market forecast for both FTRs and MTRs;
- Calculate the LRAIC+ cost of termination so that the materiality of common costs can be assessed;
- Produce FTR and MTR rates. For FTRs, a combination of per call and per minute or a pure per minute rate could be used while for MTRs a per minute basis should be used; and
- Be updated if there is evidence of a significant divergence of model inputs and assumptions from reality and which leads to a material change in the results.

Furthermore, ComReg's preliminary opinion was that Termination Rates should be set based on the costs incurred by an efficient operator and hence should be symmetric (see Section 4.5 above for a detailed discussion of this topic).

ComReg's Assessment of Respondents' Views on Question 7

- 4.179 In the Consultation, ComReg sought views from interested parties as to whether there was a need for consistency in the setting of regulated Termination Rates between FVCT and MVCT markets and whether there are any other aspects where there is a need for consistency between such markets.
- 4.180 Two of the four Respondents to the Consultation responded to this question. One Respondent agreed with ComReg's approach to consistency. The other Respondent agreed that there was a need for consistency in the approach between MTRs and FTRs but expressed concerns relating to the treatment of common costs and the need to build in a 'safety margin' into the termination rates in the event of significant divergence of model inputs and assumptions. Respondents' views and ComReg's assessment of those views are summarised in Annex 4 – A 4.141 to A 4.147.

ComReg's Final Position - Question 7

- 4.181 Having considered the views of Respondents, ComReg is of the final position that there is a need for consistency in the setting of regulated Termination Rates between the FVCT and MVCT markets.

4.7 Cost Modelling Principles

- 4.182 The AM Consultation Pricing Report set out pricing principles for Termination Rate cost models. ComReg considers that they form relevant guidelines that need to be followed when developing call termination cost models. These principles can be summarised as follows:

- Cost-oriented pricing using a pure LRIC approach, consistent with the 2009 Termination Rates Recommendation and ComReg's statutory objectives;
- BU modelling with TD validation of the outputs where appropriate;
- Model should be capable of costing each year in the period 2017-2022 (inclusive) in nominal currency;
- Hypothetical efficient operator (with productively efficient scale), with reasonable demand forecasts assumed across all modelled services carried by the networks;
- Use of modern technologies for the future regulatory period should be chosen to ensure future dynamic efficiency benefits are captured;
- The modelled termination services should assume an efficient number of points of interconnect and layers of interconnection;
- Use of economic depreciation or an equivalent approach that provides an approximation to the economic cost recovery over the lifetime of the network assets; and
- Consistency of treatment between FVCT and MVCT, particularly with regard to a single, internally consistent forecast of the voice market in Ireland.

4.183 The above principles were applied in the development of the draft and final FTR and MTR cost models which are the subject of the next section.

Chapter 5

5 Cost Modelling of Termination Rates

5.1 Overview

5.1 In this chapter, ComReg discusses the models and the underlying inputs and assumptions used to determine the appropriate level of costs associated with FTRs and MTRs. This chapter represents a revision and updating of Chapter 5 in the Consultation. That chapter detailed the cost modelling that was used to determine the Termination Rates for consultation. ComReg set out consultation questions 8 to 17 in Chapter 5 of the Consultation and its initial views on the issues raised. The Submissions from Respondents to those questions are dealt with in detail in Annex 4. Having considered the Submissions, ComReg gives its final positions below on the issues raised.

5.2 Background

5.2 As part of the Consultation the AM Consultation Pricing Report considered all relevant price control models/methodologies relating to FTRs and MTRs, which were consistent with the Market Review Consultation and ComReg's regulatory objectives, and recommended a preferred option.

5.3 The key considerations in the AM Consultation Pricing Report included:

- The choice of costing increment;
- The model structure to be used for costing purposes;
- Aspects of the costing approach; and
- The degree of consistency in the approach taken for FVCT and MVCT.

5.4 ComReg appointed TERA and AM to update existing or develop new FTR/MTR models (respectively) consistent with the findings of the Market Review Consultation and guided by the key principles identified in the AM Consultation Pricing Report.

5.5 ComReg made non-confidential versions of the FTR and MTR cost models available to operators as part of the Consultation. ComReg also arranged for workshops on both models. In the FTR model workshop TERA presented the FTR model to FSPs and answered questions on the model⁶⁸. Similarly in the MTR model workshop AM presented the MTR model to MSPs and answered questions on the model⁶⁹.

5.6 The remainder of this chapter is discussed under the following headings:

1. FTR Modelling

- Overview of the FTR Model
- Choice of Operator
- Appropriate Efficient Network Topology
- Demand for Services
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⁶⁸ Workshop held 28 March 2018 in ComReg office. Copies of the workshop presentation and minutes of the meeting including questions and responses to questions were sent on 16 April 2018 by email to FSPs provisionally found to have SMP in the Market Review Consultation.

⁶⁹ Workshop held 10 April 2018 in ComReg office. Copies of the workshop presentation and minutes of meeting including questions and responses to questions were sent on 26 April 2018 by email to MSPs provisionally found to have SMP in the Market Review Consultation.

5.3 FTR Modelling

5.3.1 Overview of the FTR Model

- 5.7 The FVCT market prior to this Decision was regulated pursuant to the 2007 FVCT Decision. A price control obligation of cost orientation was imposed as part of that 2007 decision. It was decided in the 2012 Pricing Decision that maximum FTRs be determined using a BU pure LRIC model (**‘2012 BU LRIC Model’**). The 2012 BU pure LRIC Model determined maximum FTRs to apply from 1 July 2013.
- 5.8 In 2016/17 ComReg conducted analyses of markets 3a⁷⁰, 3b⁷¹ and 4⁷² (2014 EC Recommendation) and developed a new draft version of its next generation network (**‘NGN’**) core network model (**‘Draft NGN Core Model’**)⁷³. The NGN Core Model is used to determine LRAIC+ costs for the provision of core network services. The core network supports a range of services including voice, leased lines, broadband and IPTV / multi-casting. The Draft NGN Core Model was used as a starting point for the FTR modelling for the Consultation. The FTR Consultation Specification Document provides the details on how the **‘FTR Consultation Model’** was built.
- 5.9 ComReg has completed its analysis of markets 3a and 3b and also finished development of the NGN Core Model⁷⁴, (**‘2018 NGN Core Model’**). The **‘FTR Decision Model’** uses the 2018 NGN Core Model as its base. The **‘FTR Decision Specification Document’**⁷⁵, which is a revision and update of the FTR Consultation Specification Document, provides detail on how the FTR Decision Model was built.

⁷⁰ Market 3a ‘Wholesale local access provided at a fixed location’, ComReg document 17/26 ‘Pricing of wholesale services in the Wholesale Local Access (WLA) market and in the Wholesale Central Access (WCA) markets: Further specification of price control obligations in Market 3a (WLA) and Market 3b (WCA)’, Consultation and Draft Decision, 7 April 2017, <https://www.comreg.ie/media/2018/01/ComReg1726.pdf> (the **‘Market 3a and 3b Consultation’**).

⁷¹ Market 3b ‘Wholesale central access provided at a fixed location for mass-market Products’, see document 17/26/the Market 3a and 3b Consultation referenced in preceding footnote.

⁷² Market 4 ‘Wholesale high quality access at a fixed location’, ComReg Document 18/08, “Market Review: Wholesale High Quality Access at a Fixed Location”, ComReg Response to Consultation and Further Consultation and Draft Decision, 22 Feb 2018, <https://www.comreg.ie/publication/market-review-wholesale-high-quality-access-consultation/>

⁷³ See ComReg 17/26, referenced in footnote above, for detailed discussion of the NGN Core Model.

⁷⁴ See ComReg Decision 11/18, Document 18/95, “Pricing of Wholesale Broadband Services in the WLA and WCA Markets”, 19 Nov 2018, <https://www.comreg.ie/publication/pricing-of-wholesale-broadband-services-in-the-wla-and-wca-markets/> (the **‘Market 3a and 3b Decision’**) for details of the finished NGN Core Model

⁷⁵ ComReg Document 19/48c, “Assessment of Pure LRIC FTRs in Ireland, Specification and results”, Non-confidential version, February 2019

- 5.10 The FTR Decision Model is basically the 2018 NGN Core Model plus two extra Excel worksheets. One of these, 'Voice services – Platform costs', facilitates the calculation of voice platform and billing costs on a LRIC basis. The other spreadsheet derives the transmission costs associated with voice services.

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- At the time of the Consultation, ComReg had formed the preliminary view that voice platform cost calculations should be based on the methodology in the 2012 BU LRIC FTR Model given that interconnection technical arrangements were not expected to significantly evolve during the lifetime of the Decision. ComReg also noted the views of Eircom⁷⁶ that the move from TDM⁷⁷ to IP Interconnection for Voice (for example using SIP⁷⁸), both a means of transmitting voice, is likely to be slow and insignificant in volume over the period ending in 2022. See also paragraph 5.18 below. Since the Consultation there have been recent developments in the prospects of the availability of IP Interconnection for Voice⁷⁹. [REDACTED].
[REDACTED].
[REDACTED].
Eircom in its response to ComReg's SIR of November 2016 confirmed that in relation to IP Interconnect for Voice, most material costs are fixed, it is only the variable voice specific costs of the Internet Protocol Multimedia Sub System Core ('**IMS Core**'⁸¹) / Telephony Application Server ('**TAS**'⁸²), the Session Boarder Controller ('**SBC**'⁸³) and Media Gateway Controller ('**MGC**'⁸⁴) / Media Gateway ('**MGW**'⁸⁵) that need to be recognised in the model. Section 2.4.2 of the FTR Decision Specification Document explains in greater depth how the variable elements are calculated and recognised in the FTR Decision Model. ComReg has estimated that if SIP, as the MEA, were used for interconnection instead of TDM the cost of call termination would increase by 3%. ComReg has decided not to amend the FTR Decision Model at this time to reflect the change as the increase would be marginal and the glide path approach is also, in practice, allowing an additional margin. ComReg's position is that voice platform cost calculations should therefore be based on the methodology as outlined in the Consultation.

⁷⁶ Meeting with Eircom 20 June 2017 and Open eir presentation : "ComReg briefing on Open eir VOIP and SIP interconnect plans", 29 November 2016

⁷⁷ TDM (time-division multiplexing) is a technique that divides a circuit into multiple channels based on time.

⁷⁸ IP Interconnection for Voice can for example be implemented utilising protocols such as SIP-I (Session Initiated Protocol with encapsulated Integrated Services Digital Network User Part) or SIP (Session Initiation Protocol). SIP is a communications protocol for signalling and controlling multimedia communication sessions in applications of Internet telephony for voice and video calls, ComReg considers SIP to be the Modern Equivalent Asset to TDM interconnection.

⁷⁹ See Eircom's Customer Response Document ('<https://www.openeir.ie/rap-customer-portal/> , version 5.0, 19 Feb 2019, available at <https://www.openeir.ie/rap-customer-portal/>)

⁸⁰ [REDACTED]

⁸¹ The Internet Protocol Multimedia Sub System Core (IMS Core) provides the set of functions and interfaces in the IP Multimedia Subsystem ('IMS') responsible for and to support call session control. For the purpose of this Decision the functionality for IMS data management is also included in the IMS Core.

⁸² Telephony Application Server ('TAS') provides originating and terminating telephony services for call sessions that are controlled in the IMS Core.

- Billing costs calculations are based on information received from Eircom relating to its billing capex and maintenance costs, asset life, price trends and usage provided as a response to the SIR detailed in paragraph 5.11 below. Using forecasts of traffic volumes and tilted annuities, a total incremental cost of billing is calculated. Section 2.4.3 of the FTR Decision Specification Document, sets out this process in greater detail.
- Transmission costs arise as a result of the difference in cost calculation with or without wholesale voice terminating traffic in the FTR model. These costs arise due to the number of ports required to handle traffic between Aggregation Nodes and Edge Nodes. Other costs, e.g. for cables and trenches, are largely unchanged when wholesale voice terminating traffic is removed. Section 2.4.1 of the FTR Decision Specification Document explains how transmission costs are calculated.

- 5.11 In order to assist ComReg in developing an up to date BU LRIC FTR model SIRs were issued to 21 FSPs⁸⁶ in November/December 2016, requesting information relating to traffic, technology and costs. An eight week time period for response was granted. With the assistance of ComReg's consultants, TERA, confidential and non-confidential versions of the FTR Consultation Model were produced using the information provided.
- 5.12 A TD validation was performed in the development of the FTR Consultation Model that included assets, operating costs, number of exchanges, aggregation, edge and core nodes etc. (see Section 1.4.2 and 2.1 of the FTR Consultation Specification Document).

5.3.2 Choice of Operator

- 5.13 In Section 5.1 of the AM Consultation Pricing Report four forms of operator that might be used for cost modelling were identified i.e. an actual market player, an average/typical operator, a hypothetical existing operator and a hypothetical new entrant.

⁸³ Session Border Controller ('SBC') provides security and topology hiding functionality at the access to the IMS Core for signalling and media.

⁸⁴ Media Gateway Controller ('MGC') provides functionality for control of Media Gateways, conversion to and from IMS and PSTN based signalling protocols as well as interworking of intra PSTN signalling.

⁸⁵ Media Gateway ('MGW') provides conversion to and from IP based media streams and Time Division Multiplexing ('TDM') for interfacing between IMS and PSTN as well as providing intra PSTN switching functionality.

⁸⁶ Fixed Service Providers: Airspeed Communications Limited, Blue Face, BT Communications Ireland Limited, Colt Technology Services Limited, Dialoga Servicios Interactivos SA, Digiweb Limited, Eircom, Equant Networks Systems Limited, Finarea SA, In2com Ltd, Intellicom Ireland Limited, Imagine Telecommunications Business Limited, Magnet Networks Limited, Magrathea, Modeva Interactive Ltd / Modeva Networks Ltd, Plannet 21, Telcom Ltd. , Verizon Ireland Limited, Virgin Media Ireland Limited, Vodafone Ireland Limited and Voxbone.

- 5.14 Having considered the relevant requirements of the 2009 Termination Rates Recommendation and the statutory framework applicable to ComReg including the Access Regulations together with the advantages and disadvantages associated with hypothetical operators, the AM Consultation Pricing Report recommended modelling based on a hypothetical existing operator as this facilitates the capture and reflection of past constraints e.g. number of operators, use of existing nodes in the fixed network etc.
- 5.15 Regarding the scale of the modelled operator, Section 5.3 of the AM Consultation Pricing Report recommended the use of the average scale of the actual number of large network operators having near 100% national population coverage. Eircom is the only fixed operator with this coverage. ComReg used Eircom's scale for the modelled fixed network operator.

5.3.3 Appropriate Efficient Network Topology

- 5.16 As described above in paragraph 5.8 above the FTR Decision Model is based on the NGN Core Model. This is consistent with the AM Decision Pricing Report recommendation and the 2009 Termination Rates Recommendation (see Section 5.4 of the AM Decision Pricing Report).
- 5.17 The NGN Core Model uses internet protocol ('IP') switching⁸⁷ equipment in the switching layer and wavelength division multiplexing⁸⁸ ('WDM') in the transmission layer as the modern equivalent assets ('MEA') together with the fibre and trench of Eircom. The core network also includes cables as well as civil engineering infrastructure (trenches, ducts). The core network is organised in several hierarchical levels (APT, aggregation, core) as shown in Figure 4 above. Those levels also contain the necessary components for signalling and transmission.

⁸⁷ The term IP Switching here refers to the conveyance of data or packetised voice at either layer 2 or 3 of the Open Systems Interconnection model.

⁸⁸ WDM is a method of combining multiple optical carrier signals at various wavelengths for transmission along a single fibre optic cable.

- 5.18 Interconnection refers to connecting the transmission and signalling systems of telephone service providers so that calls can be set up between customers of those operators. When connecting networks that both use TDM for voice calls the signalling used is SS7⁸⁹. Where voice is transported using IP then signalling may for example be SIP or SIP-I⁹⁰. Throughout Europe there is a transition from TDM to SIP interconnection. Eircom was requested to provide details of its plans to migrate to SIP interconnection as part of the SIR referenced in paragraph 5.11 above. This is important because TDM and SIP interconnection do not require the same equipment. For example, the MGW for call termination would not be required when the originating operator moves from C7 to SIP interconnection.
- 5.19 ComReg is of the opinion that the FTR Decision Model should be based on a scorched node approach based on Eircom's current deployment of NGN nodes as set out in Section 4.4 above. This is representative of an efficient network topology over which fixed voice will be delivered over the effective period of this Decision and beyond.

5.3.4 Demand for Services

- 5.20 Section 5.3 of the AM Consultation Pricing Report identified that demand forecasts should allow reasonable economies of scope and scale to be captured, while assuming a reasonable efficient utilisation of the network technologies over their lifetimes.
- 5.21 Section 2.12 of the FTR Decision Specification Document sets out a number of steps taken by the NGN Core Model to determine the network capacity demands for voice services. The model categorises the traffic between the different traffic topologies i.e. voice, broadband and leased lines (using exchange sites) and splits the voice capacity demand between various call types i.e. local, national, primary termination etc. as each call type can use the network assets in different ways.
- 5.22 Given different services can use different network assets, TERA recommended using routing factors to capture the consumption of resources of each network asset by each unit of service demand. Voice routing factors were updated and provided by Eircom⁹¹ to ComReg for input into the NGN Core Model. This process permitted the allocation of network costs to voice products.
- 5.23 Section 2.1.2 of the FTR Decision Specification Document discusses this topic in greater depth.

⁸⁹ Signaling System No. 7 (SS7) also known as C7 is the core signaling/control protocol used within legacy fixed and mobile networks. This is used to set up and tear down most of the world's public switched telephone network (PSTN) telephone calls.

⁹⁰ SIP with encapsulated ISDN User Part signalling ("ISUP").

⁹¹ Email from Eircom 23 February 2017, attachment Excel spreadsheet '170223_NGN RF Review'.

5.3.5 Efficient Network and Operating Costs

5.24 As set out in Section 2.1.3 of the FTR Decision Specification Document, the NGN Core Model calculates the main network costs associated with the provision of voice services i.e.,:

- Node costs

The NGN Core Model calculates the cost of the nodes in the network i.e. aggregation nodes, edge nodes, core nodes together with the WDM equipment connecting node locations (i.e. Reconfigurable optical add-drop multiplexer ('ROADM'⁹²) which is used to facilitate high capacity connectivity over the fibre cable network). Section 2.1.3.1 of the FTR Decision Specification Document sets out in detail the inputs and outputs from the FTR Decision Model associated with such calculations.

- DSLAM costs

The NGN Core Model determines the sites where there are Digital Subscriber Line Access Multiplexers ('DSLAM'⁹³) and the associated number of cards at exchanges (eVDSL) and cabinets (FTTC) (based on the number of end users). It also determines where there are Optical Line Terminations ('OLT'⁹⁴) for Fibre To The Home ('FTTH'). Section 2.1.3.2 of the FTR Decision Specification Document sets out the detail behind this calculation.

- Trench and pole costs

In calculating trench costs, the NGN Core Model considers trench and fibre lengths, trench size and type of surface of the trench that needs excavation and reinstatement. Section 2.1.3.3 of the FTR Decision Specification Document sets out the assumptions employed by TERA in deriving such results.

Part of the core network is deployed on poles. Costs of poles are assessed considering one pole every 50m and a sharing of half the poles with the access network. Note that this shared pole network does not include the pole network used exclusively for access.

⁹² A reconfigurable optical add-drop multiplexer is a form of optical add-drop multiplexer that adds the ability to remotely switch traffic from a wavelength-division multiplexing system at the wavelength layer.

⁹³ Digital Subscriber Line Access Multiplexers ('DSLAMs'). A DSLAM connects multiple customer digital subscriber line (DSL) interfaces to a high-speed digital communications channel using multiplexing techniques.

⁹⁴ Optical Line Terminations ('OLTs'). An OLT is the port or card of the active equipment upon which the fibre terminates in the exchange or at the point of inter-connection between the access and core networks.

- Dense wavelength division multiplexing ('DWDM'⁹⁵) / Code or coarse wavelength division multiplexing ('CWDM'⁹⁶) system costs / Access Packet Transport ('APT'⁹⁷) costs, and re-configurable optical add drop multiplexer or next generation high speed WDM ('ROADM') costs.

Section 2.1.3.4 of the FTR Decision Specification Document set out the basis of the calculation of the costs of DWDM, CWDM and APT equipment. Information provided by Eircom (as part of a response to a SIR dated 11 November 2016) on cost and engineering rules associated with the deployment of APT was included in relevant calculations.

- Depreciation

TERA proposed that depreciation be based on a tilted annuity approach. This has been consistently applied by ComReg for modelling of Eircom's core network and is regarded as a proxy for economic depreciation as recommended in Section 5.2 of the AM Decision Pricing Report. The annuity formula implemented by TERA in the FTR Decision Model is described in paragraph 4.128 of this document.

A nominal pre-tax weighted average costs of capital⁹⁸ ('WACC') rate of 8.18% is used in the FTR Decision Model. This is consistent with the rate set out in ComReg Decision D15/14⁹⁹ for the fixed line telecommunications sector. A pre-tax rate of 10.21% was used in the 2012 BU LRIC FTR model consistent with ComReg Decision D01/08¹⁰⁰.

⁹⁵ Dense wavelength division multiplexing ('DWDM') is a technology that puts data from different sources together on an optical fibre, with each signal carried at the same time on its own separate light wavelength.

⁹⁶ Code / Coarse wavelength division multiplexing ('CWDM') is a method of combining multiple signals at various wavelengths for transmission along fibre optic cables, such that the number of channels is fewer than in DWDM but more than in standard wavelength division multiplexing ('WDM').

⁹⁷ Access Packet Transport ('APT') is used to connect the remote sites to the aggregation nodes.

⁹⁸ A weighted average cost of capital is the rate that a company is expected to pay on average to all its security holders to finance its assets.

⁹⁹ ComReg Decision D15/14, Document 14/136, "Cost of Capital – Mobile Telecommunications – Fixed Line telecommunications – Broadcasting (Market A and Market B)" Response to Consultation and Decision" 18/12/2014, https://www.comreg.ie/media/dlm_uploads/2015/12/ComReg14136.pdf

¹⁰⁰ *Response to Consultation and Decision Notice, Eircom's Cost of Capital* Decision No. D01/08, Document No: 08/35, dated 22 May 2008, <https://www.comreg.ie/publication/response-to-consultation-and-decision-notice-d0108-eircoms-cost-of-capital/>

- Operating Costs

Operating costs are based on the core network costs contained in Eircom's audited regulatory or separated accounts¹⁰¹, adjusted for efficiencies. The NGN Core Model allocates the operating costs from Eircom's accounts (net of efficiency adjustments) to each part of the NGN network by category (e.g. exchange to Aggregation links, Aggregation node, Edge node, Core node and all other relevant links connecting the locations of the routers). The cost of each network asset is then allocated to each of the NGN network regions using allocation keys based on the capital cost for equipment and trench length. The NGN Core Model allocates the operating costs between the three services it supports i.e. Broadband, Voice and Leased Lines. This process is set out in greater detail in Section 2.1.3.5 of the FTR Decision Specification Document.

- Other material costs such as buildings, power and network management systems are included in the NGN Core Model. The process of calculation of such costs is set out in Section 2.1.3.6 of the FTR Decision Specification Document.

5.3.6 Workshop on FTR Consultation Model

- 5.25 A workshop on the FTR Consultation Model was held in ComReg's offices on 28 March 2018. All those FSPs provisionally found to have SMP in the Market Review Consultation were invited to attend.
- 5.26 TERA gave a presentation on the model after which the questions from the attendees were answered. The attendees were also reminded that if they had additional relevant information for the model they should forward it on to ComReg.

¹⁰¹ See <https://www.comreg.ie/media/2018/12/Note1a.pdf> for auditing information.

5.3.7 ComReg's Final Position – Cost Model Inputs and Assumptions

5.27 In the Consultation ComReg was of the preliminary opinion that the proposed cost model inputs and assumptions as set out above were appropriate to determine a proposed pure LRIC model for FTRs in Ireland. ComReg asked if Respondents agreed or disagreed with the proposed inputs and assumptions (Question 8) and also asked Respondents if they believed there was any other data relevant to the pure LRIC FTR model (Question 9). Two issues raised by a Respondent in relation to question 8 are dealt with in Annex 4. No other data relevant to the pure LRIC FTR model was received from Respondents in response to Question 9. In Annex 4, paragraphs A 4.149 to A 4.163 of this Decision, ComReg summarises the replies from Respondents to the questions raised, ComReg's provides an assessment of the issues raised and then ComReg's final positions on both questions is set out. Taking into account the replies from the Respondents ComReg is of the opinion that the cost model inputs and assumptions used in this Decision are appropriate to determine a pure LRIC model for FTRs.

5.3.8 FTR Calculation Results

5.28 As part of the Consultation draft maximum FTRs were calculated using an FTR Consultation Model based on the NGN Core Model used for the Market 3a and 3b Consultation – see paragraph 5.8 for details of that Consultation, and modified as outlined in paragraph 5.10.

5.29 On the basis of the BU pure LRIC modelling, as discussed above and explained in the FTR Consultation Specification Document, the BU pure LRIC FTRs (maximum rates) as consulted upon are shown in Table 15 below. The table also shows the maximum FTR in force at the time of the Consultation.

Table 15: In force and consulted upon maximum FTR Rates

€cent	In-force max. FTR 2018	Rates as per consultation				
		2018	2019	2020	2021	2022
Two-part Charge FTR: (A) Per minute portion	0.037	0.035	0.034	0.034	0.033	0.032
Two-part Charge FTR: (B) Call set- up portion	0.065	0.060	0.058	0.057	0.055	0.053
One-part Charge FTR: Call set-up included in per minute charge	0.072	0.055	0.054	0.053	0.052	0.050

Source: FTR Consultation Model

5.30 The maximum FTR in force before this Decision (for a one-part FTR on a per minute basis) was 0.072 euro cent per minute. In the FTR Consultation Model this was 0.055 euro cent in 2018 (based on an average call duration of 2.98 minutes). This change was primarily due to the following factors:

- Reduction in the WACC rate (from 10.21 % prior to 2014 to 8.18%);
- Change in equipment price trends (-10% per annum to -5% per annum);¹⁰²
- Decline in transmission costs attributed to voice service; and

¹⁰² Equipment price trends reflect a slower rate of decline, reducing the risk faced by early investors in such technology. The new FTR model recovers capital costs through the use of tilted annuities. These are designed to compensate investors who invest early in a technology to ensure they recover sufficient costs to align with a later market entrant in the future. Where the rate of decline in prices slows then the required level of compensation of invested funds calculated via a tilted annuity is reduced in the early years of cost recovery. This effectively marginally reduces the capital cost recovery required in those early years and so reduces the cost oriented tariff.

- Increase in the average call duration, which reduces the share of the call function costs which are attributed to a blended cost per minute.

- 5.31 An update of the FTR Consultation Model was prepared for this Decision. The FTR Decision Model is based on the NGN Core Model used for the Market 3a and 3b Decision – see paragraph 5.9 for details of that Decision. The Model also has been updated based on feedback from the Consultation. Eircom provided updated information on the percentages attributable to support costs and a change in asset lives from [3<math> \times \blacksquare \] to [3<math> \times \blacksquare \] years. In addition, Eircom provided new calculations of NGIN (Next generation intelligent network) costs. This concerned the interpretation of the platform expansion cost per call. The calculation of NGIN costs is described in section 2.4.2.3 of the FTR Decision Specification Document. Note that the increase seen in 2021 in Table 16 is due to how LRIC models can operate from year to year.
- 5.32 The fixed termination LRIC outputs determined using the FTR Decision Model are set out below in Table 16. The table also contains the maximum FTR prior to this Decision.

Table 16: Fixed termination LRIC outputs from FTR Decision Model

Fixed termination LRIC outputs from FTR Decision Model					
€cent	Prior max. FTR	2019	2020	2021	2022
Two-part Charge FTR: (A) Per minute portion	0.037	0.025	0.025	0.028	0.024
Two-part Charge FTR: (B) Call set-up portion	0.065	0.071	0.068	0.065	0.062
One-part Charge FTR: Call set-up included in per minute charge	0.072	0.049	0.047	0.050	0.045

- 5.33 The costs determined using the FTR Decision Model are lower than the costs in the Consultation. This is due to the following factors:
- Change in Support costs %
 - Change in asset lives from [X ■] to [X ■] years.
 - Correction of NGIN cost calculation

5.3.9 ComReg's Final Position – maximum FTRs

- 5.34 As mentioned in the Executive Summary the European Commission started work in October 2018 on developing a new cost model to understand the costs of providing fixed termination in EU/EEA countries. The aim of this project is for the European Commission to set European Union-wide FTRs that will apply pursuant to the EECC¹⁰³. These Eurorate FTRs are expected to come into force in 2021.
- 5.35 There is therefore an overlap between the Consultation/Decision of ComReg in respect of FTRs and the work on Eurorates being carried out by the European Commission. The Eurorate FTRs, once they come into force, will replace the maximum FTRs arising from this Decision¹⁰⁴.
- 5.36 The maximum FTR in force prior to this Decision could be charged using a combination of a cost per call and cost per minute rather than a cost on a purely per minute basis. ComReg was of the preliminary opinion that this should continue in circumstances where an SMP FSP charges other undertakings for FVCT on such a basis. This is consistent with the recommendation of AM that “...a per call price component is set only if the per call cost is a material proportion of the overall blended average cost per minute of termination”¹⁰⁵. Having considered the Submissions to the Consultation ComReg remains of this opinion.

¹⁰³ Established by the EECC Directive, Article 75 of which provides that the European Commission shall adopt a delegated act by 31 December 2020 setting a single maximum European Union-wide MTR and a single maximum European Union-wide FTR (referred to in this Decision as Eurorate MTRs and Eurorate FTRs respectively).

¹⁰⁴ The level of the Eurorate FTRs and Eurorate MTRs, and the manner of their implementation, is not known at present. ComReg will review developments in this regard and will consider appropriate revisions to, or revocations of, this Decision as necessary in light of the entry into force of Eurorate FTRs and MTRs.

¹⁰⁵ See Section 6.5 of the AM Decision Pricing Report.

- 5.37 ComReg asked three questions in the Consultation. First (Question 10), ComReg asked if Respondents agreed or disagreed with ComReg's preliminary views regarding the maximum FTRs that FSPs should be charged. The responses to this question are dealt with in detail in Annex 4, paragraphs A 4.164 to A 4.172. Based on the Consultation, the responses received and the planned implementation of Eurorates ComReg is of the opinion that the maximum FTRs based on a glide path as set by this Decision are appropriate i.e. maximum FTRs should be based on the glide path as in Table 17 below.

Table 17: FTRs using Glide Path

€cent	In-force max. FTR 2018	FTRs using glide path			
		2019	2020	2021 –to be replaced by Eurorates	From 2022 – to be replaced by Eurorates
Two-part Charge FTR: (A) Per minute portion	0.037	0.043	0.037	0.030	0.024
Two-part Charge FTR: (B) Call set-up portion	0.065	0.061	0.061	0.062	0.062
One-part Charge FTR: Call set-up included in per minute charge	0.072	0.063	0.057	0.051	0.045

- 5.38 Second (Question 11), ComReg asked in the Consultation if Respondents agreed with the use of a mid-point of the modelled yearly rates to set one rate for the implementation period of this Decision. The responses to this question are dealt with in detail in Annex 4, paragraphs A 4.173 to A 4.181. ComReg had proposed imposing the mid-point of the rates as the maximum rate for the entire regulatory control period. This was in recognition of the cost of implementing rate changes where there would be relatively small changes in maximum rates on an annual basis. However as the annual changes using a glide path are more substantial ComReg considers that FTRs should be changed on an annual basis.

- 5.39 Third (Question 12), ComReg asked in the Consultation if Respondents agreed with ComReg's views regarding the implementation of any decision on maximum FTRs. The responses to this question are dealt with in detail in Annex 4, paragraphs A 4.182 to A 4.188. Having considered the responses to the Consultation these rates will take effect on the first working day of the month following two full calendar months after publication of this decision.

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5.4 MTR Modelling

5.4.1 Overview of the MTR Model

- 5.40 As described in Section 3 of this document the wholesale market for MVCT on individual mobile networks up to the Market Review Decision was regulated pursuant to the 2012 MVCT Decision. In that Decision ComReg defined six separate relevant MVCT markets and stated that each of the MSPs providing MVCT services at that time had SMP. A price control obligation in the form of cost orientation was imposed on the six MSPs designated with SMP. The details of the price control obligation were finalised in the 2016 MTR Pricing Decision, in which the model implementing the BU pure LRIC methodology was decided upon (**'2016 MTR model'**).
- 5.41 Whilst AM proposed no changes to the general approach to modelling the costs of MVCT, there were aspects of the modelling process that needed to be reviewed and updated in order that the MTR model reflects the latest service and technological developments in the Irish mobile market. These included the increased use of LTE technology, the adoption of S-RAN equipment by Irish Mobile Network Operators (**'MNOs'**¹⁰⁶) and the potential growth in VoLTE and voice over WiFi (**'VoWiFi'**¹⁰⁷) services.
- 5.42 The 2016 MTR model did not explicitly model 4G radio technologies and modelled certain aspects of the network (such as backhaul assets) at a high level. ComReg recognised that attempting to incorporate the latest service and technological developments and allow for more detailed modelling of other aspects of the network would require extensive redevelopment of the 2016 MTR model and, having considered how best to reflect these developments, ComReg agreed with its advisors, AM, that the most appropriate approach was to construct a new MTR model specifically for this process (the **'MTR Consultation Model'**). The MTR Consultation Model reflected aspects of its predecessor but also used the most recent data available in relation to the Irish mobile market. Arising from feedback from the Consultation, the MTR Consultation Model was updated for the Decision, (the **'MTR Decision Model'**). The MTR Consultation Specification Document was also updated (the **'MTR Decision Specification Document'**¹⁰⁸).

¹⁰⁶ A mobile network operator (MNO) is a MSP that operates its own mobile network.

¹⁰⁷ Voice over WiFi (VoWiFi) allows a user to originate or terminate voice calls over a WiFi router.

¹⁰⁸ ComReg Document 19/48b, "Specification for the new MTR model (v1.0)", Non-confidential version, March 2019.

- 5.43 In order to identify the costs, volumes and technologies faced by MSPs active in the Irish market for MVCT services, ComReg (in consultation with AM) issued SIRs in September 2016 to seven MSPs that were proposed to be designated with SMP as part of the Market Review Consultation¹⁰⁹. A seven week timeframe for response was granted and this was subsequently extended (at the request of industry) by an additional four weeks to 14 December 2016.
- 5.44 The next sections of this Decision discuss the main modelling principles and methodologies that are applied in the MTR Decision Model and set out ComReg's views in relation to each of the key parameters. This is then followed by an overview of the main differences between the MTR Decision Model and the 2016 MTR model.
- 5.45 Following the publication of the Consultation document, a group workshop was held on 10 April 2018 with the proposed designated MSPs to review the approach taken in the MTR Consultation Model and provide them with an opportunity to discuss the proposed modelling assumptions and parameters directly with ComReg and its advisors.
- 5.46 ComReg discusses the cost modelling of MTRs in the following sections. The modelling parameters have been grouped as follows:
- **operator-related parameters** – the form of the modelled operator (hypothetical efficient existing operator), structural implementation (a BU model using the scorched node approach to reflect actual operator data), market share assumptions, network footprint and wholesale/retail costs;
 - **service-related parameters** – the service set, service volumes, voice traffic, data traffic, operator demand and busy hour service demand;
 - **technology-related parameters** – geotypes, points of interconnect, network nodes, radio access network, network coverage, S-RAN, VoLTE and VoWiFi, treatment of spectrum, mobile switching network, mobile transmission network and network expenditure; and
 - **implementation-related parameters** – increment, depreciation, WACC, modelling timeframe and mark up.

¹⁰⁹ Vodafone Ireland Limited ('Vodafone'), Three Ireland (Hutchison) Limited, Meteor Mobile Communications Limited ('Meteor'), Tesco Mobile Ireland Limited ('TMI'), Lycamobile Ireland Limited ('Lycamobile'), The Carphone Warehouse Limited and Virgin Media Ireland Limited.

5.4.2 Operator Related Parameters

Form of the modelled operator

- 5.47 As noted above in Section 5.13, the AM Consultation Pricing Report considered four types of operator that can be modelled and concluded that cost modelling should be based on a hypothetical efficient existing operator. Modelling a hypothetical efficient existing operator means that the MTR Decision Model can better reflect reality by capturing the network technologies currently deployed by MNOs to support MVCT services and considering scale similar to the actual scale achievable in the Irish market while maximising transparency for industry.
- 5.48 In modelling a hypothetical efficient mobile operator, the MTR Decision Model is not intended to mirror the costs of a specific Irish operator as its objective is not to identify operator-specific costs. Modelling an actual operator or an average operator could lead to the capture of past inefficiencies. This is inconsistent with the 2009 Termination Rates Recommendation which envisages an efficient operator rather than an actual operator (see Recital 1).
- 5.49 Modelling an efficient new entrant would be consistent with the 2009 Termination Rates Recommendation but such an approach would require additional assumptions around the pace of subscriber migration and network roll-out. Modelling a hypothetical efficient new entrant would also require an assumption about the most efficient technology that would be adopted by a new operator rolling out its network today (for example, it could be assumed that a new operator would not invest in 3G technology, but rather in LTE technology only). This could lead to network design and technology assumptions that are very different from those of the MNOs currently active in the market and produce outputs that are more difficult to calibrate against existing operator data.
- 5.50 ComReg's preferred approach is to establish the cost for MVCT of an efficient existing MNO operating in an Irish context so as to derive a maximum symmetric MTR that can be applied to all MSPs operating in Ireland. However, as has been noted, the MTR Decision Model is based on data provided by MSPs using a modified scorched node methodology. This allows for the modelling of efficient costs and scale, whilst at the same time enabling costs and technology assumptions to be closely aligned with those actually faced by the MNOs currently in the Irish market. Modelling a hypothetical existing operator in this way also allows for past constraints to be reasonably captured and, if relevant, reflected (e.g. different levels of spectrum scarcity, different numbers of network operators, use of existing network node locations).

Structural implementation

- 5.51 As noted in Section 4.2.1 above, the AM Consultation Pricing Report identified two options for the model structure, referred to as TD models and BU models. Ofcom has described the general differences in both approaches as follows:

“In a top-down approach, relationships between outputs and costs are estimated from historical accounting information, and costs are projected forward on the basis of output forecasts. In a bottom-up approach, the components of cost are identified at a more granular level. Cost causation relationships are then defined to link the quantity of each of these cost components with output and other cost drivers, based on practical and theoretical evidence”¹¹⁰.

- 5.52 The AM Consultation Pricing Report considered that a TD approach *“is not necessarily the best modelling approach to determining the costs of an efficient operator for transparent regulatory purposes”*. The report further noted *“that it is extremely difficult to use a top-down model to calculate a “pure LRIC” of any service (a small, final increment cost), since the cost-volume relationships of all cost categories would require a detailed definition. Also, top-down models do not exist for hypothetical operators and may not reflect efficient deployment, scale or choice of modern technologies”*.
- 5.53 This is particularly relevant in the case of the MTR Decision Model. While there is only one fixed network operator (Eircom) with close to 100% population coverage there are three MNOs that fulfil this criterion. Consequently, the hypothetically efficient existing operator that is the basis for the MTR Decision Model is unlikely to correspond to an actual operator. Moreover, adopting a TD approach based on the data of a particular MNO would not necessarily be representative of the hypothetically efficient existing operator.
- 5.54 ComReg has constructed the MTR Decision Model based on information sourced from actual operators in the Irish market through SIRs. Such information included:
- demand, e.g. subscriber usage, busy hour traffic profile;
 - network design e.g. cell radii, mix of backhaul technologies, planned asset capacities; and
 - cost data e.g. unit capex, asset lifetimes.
- 5.55 Certain key outputs of the MTR Decision Model were subsequently calibrated with reference to the network and financial data of actual operator(s). This helped ensure that the MTR Decision Model is consistent with the 2009 Termination Rates Recommendation which requires that a cost model should *“produce as robust results as possible and to avoid large discrepancies in operating cost, capital cost and cost allocation between a hypothetical and a real operator”¹¹¹.*

¹¹⁰ Please refer to Section A7.1 in http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement_Annex_6-10.pdf

¹¹¹ 2009 Termination Rates Recommendation, Recital 11.

Market share

- 5.56 The market share assumed for the hypothetical efficient operator is an important design principle as this determines the share of each traffic service that the hypothetical operator's network is expected to carry.
- 5.57 The 2009 Termination Rates Recommendation states that the minimum efficient scale that can be assumed in the BU PURE LRIC model is 20% and while it does not indicate a maximum market share, it accepts that Member States may deviate from the minimum efficient scale¹¹². Regarding the scale of the modelled operator, the AM Consultation Pricing Report noted that *"a neutral approach to both fixed and mobile markets is to use the average scale of the actual number of large network operators having near 100% national population coverage. This is therefore 33.3% for a national mobile network operator (as there are three such operators for mobile serving 100% of the mobile market)"*.
- 5.58 Previously, in the 2016 MTR Pricing Decision, ComReg, while accepting "1/N" methodology as an appropriate basis for determining the modelled market share, also recognised the significant uncertainty that persisted at that time as a result of the then recent merger between Three and O2. Consequently, having considered concerns raised by a number of Respondents to the corresponding consultation in relation to the market share assumptions, ComReg deemed it to be prudent, at that time, to assume a 25% market share throughout the modelled timeframe of the 2016 MTR model.
- 5.59 However, now that the merger between Three and O2 has occurred and given that there is no evidence of a fourth MNO emerging in the Irish market at this stage, ComReg is of the view that it is appropriate to apply a 33.3% market share in the MTR Decision Model for all years after 2013. As a result, the MTR Decision Model uses a 25% market share for the hypothetical efficient operator up to 2013 on the basis of the four MNOs that were active up to that time and then assumes a 33.3% market share thereafter to reflect the merger between Three and O2 that resulted in three MNOs remaining active after 2013.
- 5.60 Applying the 1/N approach in this way means that the assumed market share for the period of the price control is 33.3% as per Table 18 below.

¹¹² Minimum efficient scale is the point in the average total cost curve beyond which no significant economies of scale can be achieved, i.e., the minimum level of output at which average total costs are minimised. This measure is a widely used starting point for assumed efficient size based on a number of network operators active in the territory.

Table 18: Market Share of Hypothetical Efficient Operator

Market Share	2018	2019	2020	2021	2022
	33.3%	33.3%	33.3%	33.3%	33.3%

Source: MTR Decision Specification Document, page 9, Figure 3.4

Network footprint

- 5.61 The hypothetically efficient existing operator in the MTR Decision Model is assumed to have similar network coverage to that achieved by the three MNOs identified as having near 100% population coverage¹¹³. While the MTR Decision Model expresses coverage in terms of population, the 2016 MTR model expressed coverage in terms of area. However, in developing the MTR Decision Model, AM assumed input levels of population coverage that lead to similar levels of area coverage as found in the 2016 MTR model – see Table 19 below:

Table 19: Input Coverage of the Country (unless otherwise stated) by Technology in the 2016 MTR model and the MTR Decision Model

Technology	Population coverage (MTR Decision Model)	Resulting area coverage (MTR Decision Model)	Area coverage (2016 MTR model)
2G (from 2003)	98.7%	84.7%	84.7%
3G (2100MHz, up to 2012)	84.3%	35.5%	35.5%
3G (900MHz, by 2019, in the two rural geotypes only)	92.6% (of Rural 1 / Rural 2)	77.3%	62.8%
4G (by 2019)	98.7%	84.7%	Not applicable

Source: MTR Consultation Specification Document, page 9, Figure 3.4

- 5.62 Further information on the technologies used to achieve the modelled level of coverage can be found below in the section on Technology-Related Factors.

Wholesale/retail costs

- 5.63 In Section 3.3.4 of the MTR Consultation Specification Document, AM considered that the costs of an operator's retail activities can be assumed to be either separated or integrated within the operator's business, as illustrated below:

¹¹³ Meteor (eir Mobile), Three and Vodafone.

Figure 5: Options for Consideration of Retail Costs

Source: MTR Decision Specification Document, Figure 3.13

- 5.64 In a *separated* approach, network services (such as voice traffic) are costed separately from retail activities (such as marketing or handset subsidies). Business overheads are then marked up between network and retail activities, and the wholesale cost of supplying mobile termination is only concerned with the costs of the network plus a share of business overheads attributable to the network.
- 5.65 In an *integrated* approach, retail costs are considered integral to network services and included in service costs through a mark-up, along with business overheads. Consequently, there is no concept of 'wholesale' access to mobile termination in the integrated case, as all retail costs are included in the service costing.
- 5.66 AM concluded that a separated approach is preferable given that ComReg, to date, has identified its market analysis as that relating to the *wholesale* MVCT market (see the Market Review Consultation). As a result, wholesale and retail can be considered as different parts of a vertically structured company and the MTR Decision Model only includes those costs that are relevant, either directly or indirectly, to the provision of the wholesale network termination service.

5.4.3 Service Related Parameters

Service set

- 5.67 Service parameters are a necessary input to the model which calculates long-run costs. The MTR Decision Model includes information on subscriber numbers, service volumes and traffic patterns. In developing the cost model, it was therefore first necessary to gain an understanding of the aggregate historic and forecast traffic in the Irish mobile market over the timeframe of the model.
- 5.68 The provision of both voice and data services across a single infrastructure generates economies of scale and scope (reducing the unit costs for voice and data services). As a proportion of network costs is allocated to all such services, a full list of services is included in the MTR Decision Model.

- 5.69 As noted in Section 3.3.1 of the MTR Decision Specification Document, while some of the non-voice services are proven services (particularly services like SMS on mobile networks), other non-voice services, such as 4G mobile broadband or VoLTE, can give rise to forecast uncertainty when included in the regulated prices for voice. ComReg is aware that some MNOs are trialling VoLTE and consequently have included a feature in the MTR Decision Model to assess the impact that carrying VoLTE services might have on the MTR charges across the modelled period. For example, assuming a proportion of all voice is carried using VoLTE from 2018 onwards in the service set would reduce the 2019 pure LRIC of MVCT by 3%.
- 5.70 However, ComReg is of the view that as VoLTE is not currently an established service it is not included in the service set for the next price control period. Therefore, in developing the MTR Decision Model, the following mobile traffic services were considered:
- 2G and 3G on-net mobile calls
 - 2G and 3G outgoing calls to other mobile operators
 - 2G and 3G outgoing calls to fixed
 - 2G and 3G outgoing calls to international
 - 2G and 3G domestic incoming
 - 2G and 3G international roaming (inbound) to mobile
 - 2G and 3G on-net SMS¹¹⁴
 - 2G and 3G outgoing SMS
 - 2G and 3G incoming SMS
 - 2G and 3G on-net MMS¹¹⁵
 - 2G and 3G outgoing MMS
 - 2G and 3G incoming MMS
 - 2G packet data
 - Release-99 (low speed) packet data
 - High Speed Downlink Packet Access ('HSDPA'¹¹⁶) packet data
 - High Speed Uplink Packet Access ('HSUPA'¹¹⁷) packet data
 - 4G packet data

¹¹⁴ On-net SMS is a Short message service between two subscribers (retail, MVNO or inbound roamer) of the modelled operator.

¹¹⁵ Multimedia Message Service between two subscribers (retail, MVNO or inbound roamer) of the modelled operator.

¹¹⁶ High Speed downlink Packet Access (HSDPA) packet data are megabytes of packet data (excluding IP overheads) transferred to and from a subscriber (retail, MVNO or inbound roamer) using the HSPA network.

¹¹⁷ High Speed Uplink Packet Access (HSUPA) packet data are megabytes of packet data (excluding IP overheads) transferred to and from a subscriber (retail, MVNO or inbound roamer) using the HSPA network.

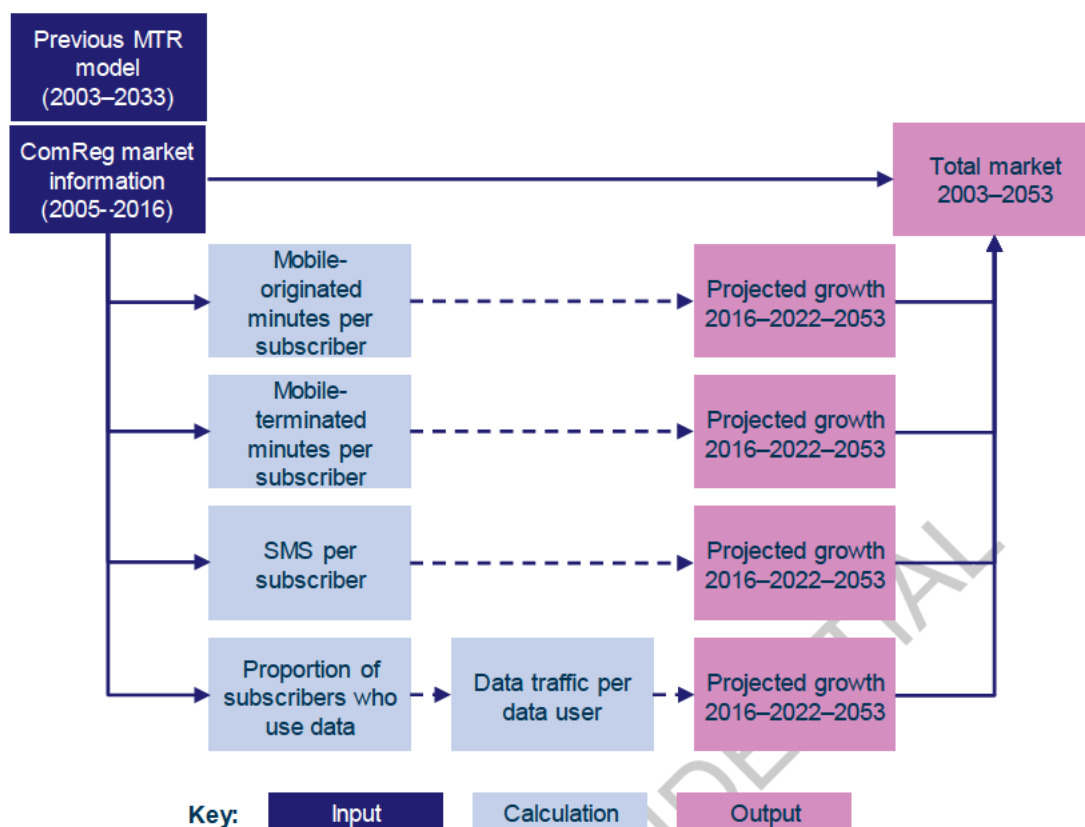
- 5.71 Section 3.3.1 of the MTR Decision Specification Document discusses this further, in particular its concerns around the treatment of non-voice services (e.g. 4G mobile broadband).

Service volumes

- 5.72 The MTR Decision Model uses ComReg statistics on the total market in Ireland, supplemented by information provided by Irish mobile network operators (in the form of their responses to SIRs and Quarterly Key Data Reports requests) together with data extracted from the 2016 MTR model, to quantify historical demands and derive forecast trends for both mobile market subscribers and traffic. This is to ensure that the modelled network is dimensioned with reference to all the traffic that is carried on Irish mobile networks.
- 5.73 Traffic volumes are modelled at the market level by considering the historic demand and forecast volume trends of all the different services carried on mobile networks and restating these in terms of per subscriber usage. AM based the population time series on sources published by the CSO while the historical penetration rates are derived with reference to the modelled subscriber numbers and population levels for each year up to 2016. The penetration rate is then assumed to be constant after 2016 so that subscriber numbers evolve each year after 2016 in line with the forecast population trend.

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Figure 6: Market Calculation Framework



Source: MTR Decision Specification Document, Figure 4.1

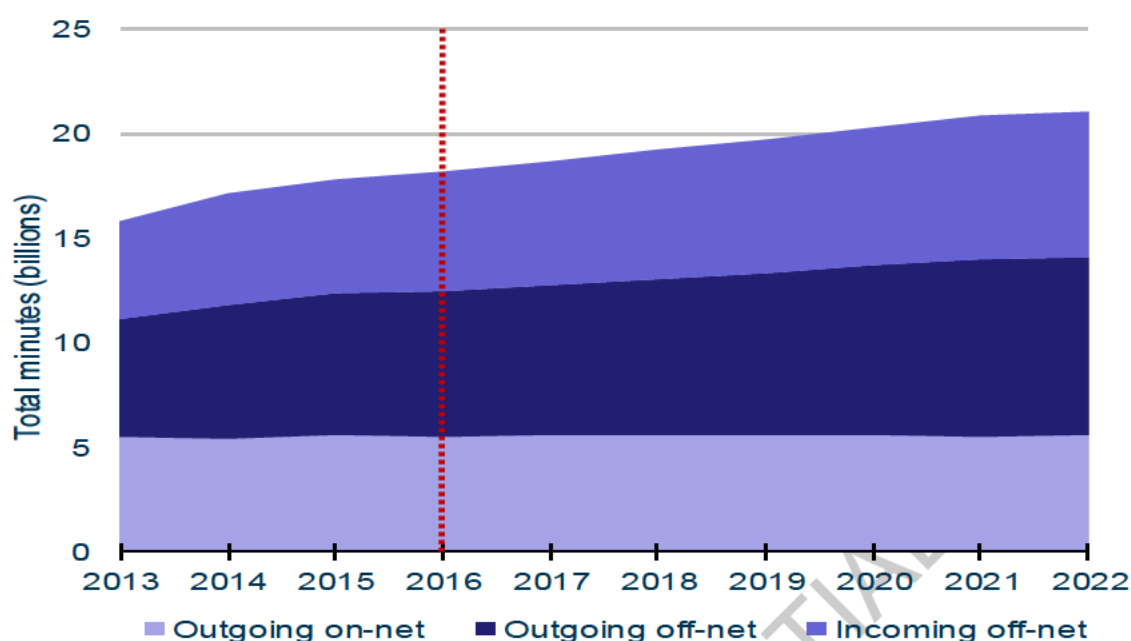
5.74 This market information was then rearranged to suit the categories used in the MTR Decision Model, with voice, SMS¹¹⁸ and data traffic treated separately. Voice and SMS were further split into sub-categories: incoming, outgoing and on-net traffic. All three were also split into the different radio technologies modelled. Further information on the market calculations can be found in Chapter 4 of the MTR Decision Specification Document.

Voice traffic

5.75 Historical total voice traffic and subscribers from 2005 to 2016 were used to derive a forecast for the duration of the MTR Decision Model. Voice usage per subscriber is then assumed to peak in 2021 and remain constant thereafter, so that total voice usage will then evolve in line with population growth.

¹¹⁸ SMS volumes do not have a material impact on the costs modelled for voice services.

Figure 7: 'Evolution of Total Voice Usage in Ireland'



Source MTR Decision Specification Document, Figure 4.5.

- 5.76 Section 6 of the AM Consultation Pricing Report noted that a degree of consistency needs to be maintained in the approaches for deriving FVCT and MVCT. With regard to voice market forecasting, it recommends that:

“.... a single voice market forecast feeds into both models to dimension the network assets required. This can ensure, for example, that the volumes of fixed voice origination to mobile users assumed in the fixed model are consistent with the volumes of mobile voice termination from fixed users assumed in the mobile model, given the market shares of the selected hypothetical operators.”

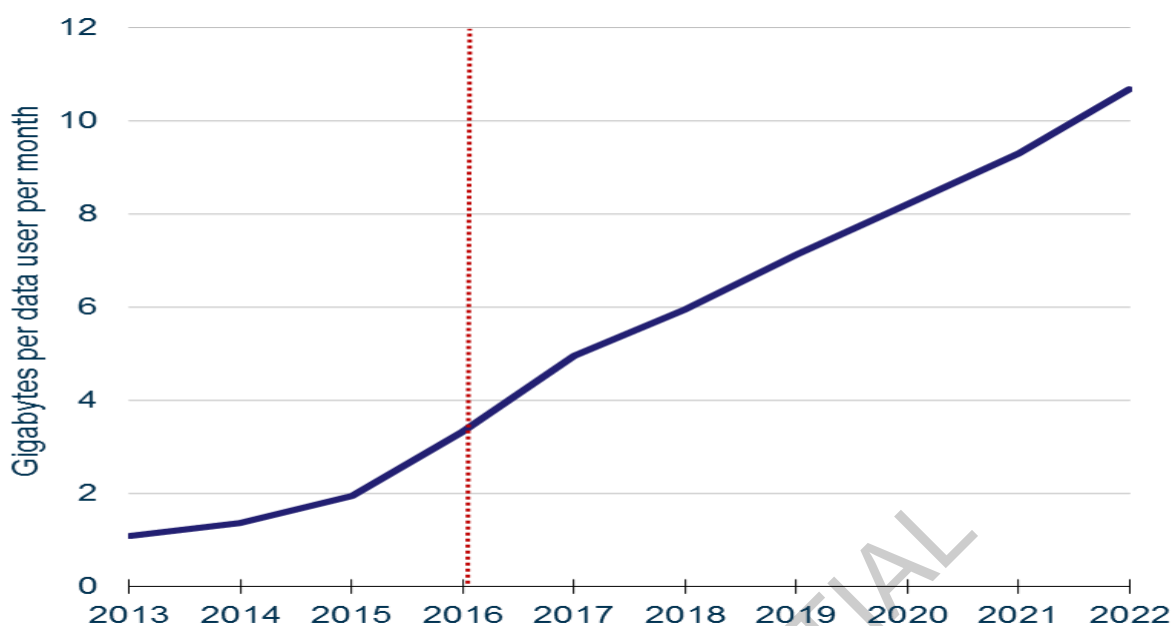
- 5.77 In developing the MTR Decision Model, Section 3.3.2 of the MTR Decision Specification Document recognises that the voice forecasts for the FVCT and MVCT need to be aligned.
- 5.78 Further information on the voice traffic calculations can be found in Section 4.2 of the MTR Decision Specification Document.

Data traffic

- 5.79 AM based the data forecasts on the forecasts that underlie ComReg's cost-benefit analysis of a change in use of 700MHz band that was published in 2015¹¹⁹. These forecasts run to 2035 and were developed taking into account increased mobile penetration and usage per device, population growth, WiFi offload and declining use of legacy technology handsets.
- 5.80 The MTR Decision Model calculates its own data forecast using these inputs, by calculating the megabytes of usage per data subscriber per month until the end of the above forecast in 2035, and then applying this usage per subscriber to the forecast subscriber base in future years. The resulting forecast usage per data subscriber per month is illustrated below:

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¹¹⁹ ComReg Information Notice 15/62. In particular, see <https://www.comreg.ie/csv/downloads/ComReg1562a.pdf>, Figure 4.

Figure 8: Forecast of Gigabyte Consumption per Subscriber per Month

Source: MTR Decision Specification Document, Figure 4.9

- 5.81 This significant increase in volume on a year-to-year basis leads to a corresponding increase in the number of sites and base stations, as no new spectrum is assumed to become available in the MTR Decision Model after the auction of the 3.6GHz band.

Operator demand

- 5.82 Given that the MTR Decision Model assumes that the hypothetical efficient existing operator has a market share of 33.3%, this market-average scale is applied to the total applicable market volumes to determine per operator demand. This is done for all services with one exception, as described below.
- 5.83 In the 2016 MTR model, actual data volumes for the period 2007–2013 were reduced by 33% before being included in the model. ComReg took the decision to reduce data traffic volumes in this way as a review of the historic data usage experienced by the four MNOs active in the market at that time concluded that a level of dongle traffic appeared to be an outlier in the market — as it did not seem to be representative of the data traffic carried by a hypothetical efficient mobile operator with 25% market share. To maintain consistency with this aspect of the 2016 MTR model, AM continued to apply a 33% reduction to actual market data volumes for the period 2007–2013 in the MTR Decision Model, but from 2014 onwards no reduction has been applied and the full market data volumes are modelled.

Busy hour service demand

- 5.84 Service demand for the hypothetical efficient existing network operator is calculated on an annual basis but, for network dimensioning purposes, the busy hour load for each service also has been considered. This is calculated based on the share of traffic in the busy hour, the average duration of voice calls, and the proportion of data traffic in the busiest data path (uplink or downlink).
- 5.85 The MTR Decision Model assumes that there are 250 busy days in a year for voice and 365 for both data and SMS. Other key assumptions relating to peak hour dimensioning include the proportion of busy-day traffic that occurs in the voice busy-hour and also in the data busy-hour.
- 5.86 The calculation of busy-hour Erlangs ('BHE'¹²⁰) for each 2G and 3G voice service in both the voice busy hour and the data busy hour is further uplifted by 10% to allow for fluctuations in busy-hour loading, as was assumed in the 2016 MTR model. Other voice related inputs include call attempts per successful call, additional ringing time per call and average call duration.
- 5.87 Further details of the basis for determining the service volumes that the modelled operator is expected to carry, both on an annual basis and at peak times, can be found in Section 5 of the MTR Decision Specification Document.

5.4.4 Technology Related Parameters

- 5.88 Having determined the level of voice and data services pertaining to the hypothetical network operator it is then necessary to consider the technology parameters that will inform the types and quantities of network equipment and infrastructure that will be required to deliver those services to end users.
- 5.89 There are a number of key cost drivers that the 2016 MTR model considered in order to dimension the network. Service demand from all traffic services is combined with network usage/routing factors to form aggregated cost drivers to capture the relative usage of each network element by each unit of service demand. This enabled the MTR Decision Model to calculate the required deployment of appropriate network elements in order to meet the demands for capacity and coverage.

¹²⁰ An Erlang is a measurement of traffic traditionally used in telephone networks (one Erlang represents the continuous use of one voice path).

- 5.90 However, as capacity and coverage requirements are not uniform across the country it is also necessary to consider the extent to which geographical factors can influence the costs of delivering services to end users. Consequently, the service demand has to be attributed to the different geotypes in the MTR Decision Model.

Geotypes

- 5.91 The definition of geotypes is central to the modelling as they provide a means of classifying different geographical areas of a region according to the factors that might influence relative costs and demand. This allows the modelling of the different dynamics of network deployments in different geographies (for example, coverage-driven deployments in rural areas, versus capacity-driven deployments in urban areas).
- 5.92 AM defined geotypes for the MTR Decision Model based on the 2011 Census Electoral Divisions available from the CSO¹²¹. AM has undertaken an analysis of the CSO data on land area¹²² and population for each of the 3,409 electoral divisions to derive a population density for that area. AM then uses the derived population densities to categorise each electoral division into one of five geotypes as presented in Table 20 below.

Table 20: Characteristics of geotypes

Geotype	Population density	Population	Land area (km ²)	Proportion of national population	Proportion of national land area
Dense urban	>2500	1 210 282	302	26.38%	0.44%
Urban	500–2500	886 677	878	19.32%	1.28%
Suburban	100–500	813 354	3 921	17.73%	5.73%
Rural 1	20–100	1 339 366	34 749	29.19%	50.75%
Rural 2	<20	338 573	28 616	7.38%	41.80%

Source: CSO and MTR Decision Specification Document, Figure 6.1

- 5.93 Further information on the approach taken to the modelling of geotypes in the MTR Decision Model can be found in Section 6.1.1 of the MTR Decision Specification Document.

¹²¹ 2011 Census Boundaries, Electoral Divisions, published by Central Statistics Office, licensed under Creative Commons Attribution 4.0 (CC BY4.0), available at <https://data.gov.ie/dataset/census-2011-boundary-files>. 2011 data is used to inform the geotype classifications as this was the latest data available at the time the Current MTR model was first developed. While 2016 data is now available Analysys Mason have assessed this data and found that, as the geotype analysis is undertaken at a very granular level, updating for the 2016 data would have no material impact on the resulting geotype classifications.

¹²² Analysys Mason use “land area” rather than “total area”, to exclude lakes and inlets (e.g. the Shannon Estuary).

- 5.94 AM undertook a calibration exercise to cross-check the number of sites per geotype derived in the MTR Decision Model against an estimate of the number of base station locations in each of the five geotypes that has been derived from ComReg's mobile site database. The results of this calibration exercise are contained in Annex C.1 of the MTR Decision Specification Document.
- 5.95 ComReg was of the preliminary view that the use of 2011 CSO data on population and land area for each of the 3,409 electoral divisions is a reasonable basis to model geotypes in the MTR Decision Model and captures the key characteristics such as population density, commuting spread around urban centres and topological / civil planning variation that can influence MNOs' planning decisions.

Points of interconnect

- 5.96 Interconnection to mobile networks is typically offered at a national level because the interconnecting operator cannot be expected to know where on the host MNO's network the handset of the mobile subscriber is located. Consequently it is sometimes necessary to route a call across the mobile network when the handset is in another region of the country. As a result, the average number of points of interconnection is expected to be lower on a mobile network than on a fixed network although, even on a mobile network, the need for network resilience will mean that an efficient operator might choose to have interconnection in more than one location.
- 5.97 ComReg, as part of its SIRs, sought information from operators relating to points of interconnection. AM conducted a review of the subsequent responses and identified that, on average, mobile operators have points of interconnection at two distinct locations and therefore are of the opinion that interconnection to other networks can be carried out efficiently at two distinct locations.

Network Nodes

- 5.98 Network nodes have been discussed in Section 4.4 above and in Section 3.2.6 of the MTR Decision Specification Document.

Radio access network

- 5.99 For modelling purposes, the hypothetical efficient mobile operator's network needs to be designed and dimensioned on the basis of a specified modern technology. The Radio Access Network ('**RAN**') comprises the base station sites and equipment required to implement a radio access technology connecting the end user to the mobile core network.

- 5.100 The network design for the radio layer considered the three radio technologies: 2G Global System for Mobile Communications ('GSM'¹²³), 3G Universal Mobile Telecommunications System ('UMTS'¹²⁴), and 4G Long-Term Evolution ('LTE'¹²⁵). This included not only a layer of coverage, but also capacity upgrades, and the physical site requirements (single technology sites, co-located sites, own tower sites and third-party installations). The network design first considered sites for coverage and then considered the radio interface traffic loading to calculate the additional assets required to carry this loading. The potential impacts of VoLTE, VoWIFI and S-RAN deployments were also considered.
- 5.101 The 2016 MTR model explicitly considered both 2G and 3G technologies. ComReg is of the view that it is still appropriate to include both technologies in the MTR Decision Model as an efficient mechanism for delivering mobile services including MVCT over the coming years. In developing the MTR Decision Model, AM implemented a cell-breathing calculation in the 3G dimensioning to capture the fact that when traffic loads increase in a 3G network the subsequent rise in the signal-to-noise ratio acts to reduce the range of the cell.
- 5.102 In the 2016 MTR model it was concluded that although 4G mobile technologies such as LTE could be deployed in the long term, 4G was expected to be largely focused on delivering higher-rate mobile data services. Therefore, the previous MTR Decision Model only considered 4G to the extent that it was assumed that an element of future data demand would be carried on 4G and did not explicitly model the costs associated with 4G deployment.
- 5.103 ComReg remains of the view that it is unlikely that a 4G overlay would be used to deliver large volumes of wholesale mobile voice termination within the time frame of this Decision. However, there are economies of scale and scope associated with deploying a 4G overlay with 2G/3G networks, due to asset sharing. While these are only likely to have a small impact on the pure LRIC of wholesale MVCT they could have a larger impact on the LRAIC+ of wholesale MVCT.
- 5.104 Also, 4G has now emerged as a proven technology in Ireland to an extent that was not evident when the 2016 MTR model was being developed. Therefore, the costs of 4G technology have been captured in the MTR Decision Model to fully understand its impact on the costs of MVCT.

¹²³ "GSM" means Global System for Mobile Communications from the European Telecommunications Standards Institute ("ETSI").

¹²⁴ "UMTS" means the Universal Mobile Telecommunications System family of standards from the European Telecommunications Standards Institute ("ETSI") and Third Generation Partnership Project ("3GPP").

¹²⁵ "LTE" means the Long Term Evolution family of standards from the European Telecommunications Standards Institute ("ETSI") and Third Generation Partnership Project ("3GPP").

Network coverage

- 5.105 Coverage is considered a central aspect of mobile network deployment and of the radio network in particular. All mobile networks in Ireland currently provide significant coverage using their 2G/3G networks, as required by their licences. These actual levels of coverage have been reflected in the MTR Decision Model.
- 5.106 The 2016 MTR model expressed coverage in terms of geographic area, whilst the MTR Decision Model expresses coverage in terms of population. On this basis, AM assumed input levels of 2G and 3G 2100MHz population coverage that lead to similar levels of area coverage for those technologies as found in the 2016 MTR model. The input population coverage (and corresponding area coverage) for the MTR Decision Model are summarised in Figure 3.4 of the MTR Decision Specification Document (re-produced in Table 19) and compared to those found in the 2016 MTR model.
- 5.107 The MTR Decision Model assumes that both 3G and 4G deployments reach the same level of coverage as the modelled 2G network in the long term. The 3G and 4G coverage deployments have been calibrated to ensure that the 2016 base station counts of the modelled operator are in the range of the asset counts of actual operators, as derived using ComReg's licence data. A similar calibration using the actual 2G base station deployments is not undertaken since they comprise both coverage and capacity base stations.
- 5.108 AM also used a set of multipliers in the MTR Decision Model to estimate radii for different spectrum bands, based on the assumed 2100MHz radii. These are consistent with those that AM used in cost models in other jurisdictions, see Table 21 below:

Table 21: Multipliers to Convert Cell Radii across Spectrum Bands

Band	800MHz	900MHz	1800MHz	2100MHz
Multiplier	1.7	1.5	1.1	1.0

Source: MTR Decision Specification Document, Figure 3.5

S-RAN

- 5.109 The 2016 MTR model assumed that 2G Base Transceiver station ('**BTS**'¹²⁶) and 3G NodeBs¹²⁷ would remain as separate pieces of equipment in the long term. However, in recent years, vendors have designed base stations that provide 2G and/or 3G and/or 4G functionality. This is referred to as single-RAN ('**S-RAN**') equipment. There is evidence of S-RAN being used in Ireland.
- 5.110 The use of S-RAN in the MTR Decision Model gives rise to greater economies of scope between technologies resulting in fewer base station units (i.e. one per site rather than one per technology per site).
- 5.111 This would lead to lower operating costs per site (e.g. through more efficient power use), but there would be a significant capex outlay for new base station units (which have a higher unit cost than any one of three individual radio technologies due to their greater functionality). AM identified two options for modelling the impact of S-RAN:
- To add new network design calculations to dimension 'combined base station' assets, including separate asset entries for each of their sub-components, which are deployed as replacements for existing base stations and sub-components over a defined period, or
 - To adjust the unit cost levels of the standalone radio assets and model a wide-scale replacement of these assets to trigger appropriate levels of capex.
- 5.112 Given the complexity involved in modelling the first option AM has opted for the second, which can be implemented through modification of the MEA unit costs of the standalone deployments to achieve the expected levels of capex and opex. S-RAN is assumed to be activated from 2014 onwards in the MTR Decision Model. Further detail on the cost modelling approach taken is described in Section 3.2.1 of the MTR Decision Specification Document.

¹²⁶ The Base Transceiver station (BTS) is the electronics equipment and antennae that together comprise a 2G access site.

¹²⁷ Node B is the access node of the 3G network that transmits and receives communication signals from user equipment and the rest of the mobile network.

VoLTE and VoWiFi

5.113 The MTR Decision Model also includes the functionality of a VoLTE platform (as the next generation of mobile telephony) and of VoWiFi, in order to understand the possible cost impact of these technologies on wholesale MVCT within the forthcoming regulatory period. However, ComReg is of the view that there is still significant uncertainty both in terms of modelling the costs of such platforms in the Irish context and in understanding the extent of their use to carry mobile voice traffic in the long-run. Consequently, the MTR Decision Model assumes that both platforms are not currently deployed and that all forecast voice continues to be carried using 2G and 3G networks.

Treatment of spectrum

5.114 The spectrum holding of the existing mobile network operators in Ireland is set out in Table 22 below. Prior to 2013, the spectrum holdings for the modelled operator are consistent with the spectrum holdings from the 2016 MTR model and from 2013 onwards the modelled operator's assumed spectrum holding is based on an average of all operator holdings and aligns with its assumed market share, i.e. the modelled operator is assumed to hold one-third of the available spectrum within each band, rounded to the nearest block size of 5MHz.

Table 22: Paired Spectrum Holdings by Operator and Band

Operator	800MHz	900MHz	1800MHz	2100MHz	3.6GHz
Three	2×10	2×5 + 2×10	2×20 + 2×15	2×30	100
Vodafone	2×10	2×10	2×25	2×15	85/105
Meteor	2×10	2×10	2×15	2×15	80/85
Total	2×30	2×35	2×75	2×60	265/290
Generic operator	2×10	2×10	2×25	2×20	2×45

Source: MTR Decision Specification Document, Figure 3.7

5.115 Each band is assumed to be used for either capacity or coverage for one of the three radio technologies and this notional spectrum holding is not assumed to differ in the modelled scenario of full traffic and the modelled scenario of traffic without mobile termination. As a result, the spectrum licence costs will not be part of the pure LRIC for MVCT.

5.116 For a more detailed overview of spectrum allocations, please see Section 3.2.2 of the MTR Decision Specification Document.

5.117 In the MTR Decision Model AM uses the values for spectrum usage fees for the years prior to 2013 implied by the 2016 MTR model and have used the following sources for the spectrum payments for subsequent years:

- the 2100MHz spectrum licences, as published on the “Mobile licences” page of ComReg’s website

- ComReg's information notice, document 12/123, published following the auction of 800MHz, 900MHz and 1800MHz spectrum in 2012
- Ofcom's analysis of the Irish 2012 spectrum auction
- ComReg's publications on the 3.6GHz auction

5.118 The calculation of spectrum payments includes the access fees and annual usage fees that are paid by Irish operators and takes into account the level of payments and the time value of money. As a result, spectrum fees are calculated on a year-by-year basis with upfront fees calculated as a capex and annual spectrum usage fees calculated as an opex. For each modelled year, the fees are allocated between 2G, 3G and 4G technologies.

5.119 Please see Section 3.2.2, 3.23 and Section 6.10 of the MTR Decision Specification Document for a more detailed discussion of how the costs associated with spectrum payments are derived for the hypothetical operator in the MTR Decision Model.

Mobile switching network

5.120 The mobile switching network comprises the nodes and equipment necessary to provide the various services such as call routing, message transfer and internet access for the subscribers connected through the RAN. The 2009 Termination Rates Recommendation stipulates that the switching network layer could be specified as NGN-based for the purposes of BU pure LRIC modelling of MTR costs.

5.121 Mobile switching networks have been evolving for many years in Ireland and long-established operators have upgraded legacy MSC switches in conjunction with 3G deployment and then again for 4G deployment. As all Irish operators have upgraded their networks for 4G deployments, an all IP-core appears to be a reasonable assumption for the hypothetical operator to deploy.

5.122 To capture the upgrades necessary for a 4G network, AM assumed the use of an industry standard enhanced packet core ('**EPC**') architecture while the introduction of VoLTE requires the deployment of an IP Multimedia subsystem ('**IMS**'¹²⁸).

¹²⁸ IP Multimedia Sub system (IMS) is a framework for delivering IP multimedia services.

5.123 Different types of switches are necessary to ensure the network of the operator modelled is able to function as planned to offer mobile services. Table 23 presents these switches and states the minimum number required in any network. The traffic load on the network may then require larger numbers of units to be deployed. Some switches are assumed to have redundant deployments.

Table 23: Overview of the Switch Capacity Assumptions

Asset	Assumed capacity driver	Minimum deployment	Asset	Assumed capacity driver	Minimum deployment
GSM MSC ¹²⁹	BHCA ¹³⁰	2	IN ¹³¹	Subscribers	1
MSS ¹³²	BHCA	2	VMS ¹³³	Subscribers	1
MGW ¹³⁴	BHE ¹²⁰	2 × 2 (for redundancy)	MMSC ¹³⁵	Per second	1
SGSN ¹³⁶	SAU ¹³⁷	2	SMSC ¹³⁸	Per second	2 × 2 (for redundancy)
GGSN ¹³⁹	PDP ¹⁴⁰	2	Billing	CDR ¹⁴¹ s	1
4G MME ¹⁴²	Gbit/s	2	PoI ¹⁴³	BHE	2
4G SGW ¹⁴⁴	Gbit/s	2	I-SBC ¹⁴⁵	Mbit/s	2
HLR ¹⁴⁶	Subscribers	2	Call server	BHCA	1

¹²⁹ Global system for mobile communications mobile switching centre (MSC).

¹³⁰ Busy-hour call attempts (BHCA) refers to the peak number of times per hour that the subscriber base tries to make a call over the network.

¹³¹ The intelligent network (IN) platform provides value-added traffic services (e.g. call screening, reverse charges and premium rate number provision) mainly related to voice calls.

¹³² MSC Server (MSS) is a 3G core network element which controls the network switching subsystem elements.

¹³³ Voicemail system (VMS) is a platform that sends, stores and retrieves voice messages.

¹³⁴ Media Gateway (MGW) acts as a bridge between different networks (2G, 3G IP, etc.).

¹³⁵ MMS Centre (MMSC) receives and stores multimedia messages sent to subscribers on the network.

¹³⁶ Subscriber GPRS Serving Node (SGSN) locates mobile devices and routes data traffic between them.

¹³⁷ Simultaneously attached users (SAU)

¹³⁸ SMS centre (SMSC) is the short message switch centre which receives and stores short messages sent to subscribers on the network.

¹³⁹ Gateway GPRS support node (GGSN) allows 2G and 3G networks to interface with the internet.

¹⁴⁰ Packet data protocol (PDP) is a network protocol used by packet switching external networks to communicate with GPRS (General Packet Radio Services) networks.

¹⁴¹ Call Data Record (CDR) is a data record produced by a telephone exchange or other telecommunications equipment that documents the details of a telephone call or other telecommunications transaction (e.g., text message).

¹⁴² Mobility Management Entity (MME) handles the signalling related to mobility and security for the 4G radio access network.

¹⁴³ Point of Interconnect (POI) is the physical linking of a carrier's network with equipment or facilities that belongs to another carrier's network.

¹⁴⁴ Serving Gateway (SGW) acts as a router for data between the subscriber device and external networks.

¹⁴⁵ Interconnect session border controller (I-SBC) – manage voice services.

¹⁴⁶ Home location register (HLR) stores details of subscribers authorised to use the network.

Asset	Assumed capacity driver	Minimum deployment	Asset	Assumed capacity driver	Minimum deployment
AUC ¹⁴⁷	Subscribers	1	TAS ¹⁴⁸	BHCA	1
EIR ¹⁴⁹	Subscribers	1	SBC	BH ¹⁵⁰ voice Mbit/s	1

Source: MTR Decision Specification Document, Figure 6.9

5.124 Please see Section 3.2.4 and Section 6.8 of the MTR Decision Specification Document for more detailed discussion of the modelling of the mobile switching network and support systems.

Mobile transmission network

5.125 Transmission infrastructure connects the active equipment to ensure the transport of voice, message and data traffic between the different network equipment nodes. The transmission in a mobile network can be further classified in terms of:

- Base station last-mile access ('LMA') to a hub
- hub to BSC¹⁵¹ or RNC¹⁵² (if applicable)
- BSC or RNC to main switching sites (containing MSC¹⁵³ or MGW) if not co-sited
- Core transmission between main switching sites (between MSC or MGW).

5.126 The first three classifications relate to the transmission links in the access network and between the access and the main switch sites in the core network and are often categorised as backhaul links. Providing backhaul presents a significant cost to the mobile operator and can vary substantially depending on the network topology, traffic load and geographic conditions. Typical solutions for providing transmission can include a variety of technologies, such as:

- leased lines (E1, STM 1¹⁵⁴ and higher, 100Mbit/s and higher)
- self-provided microwave links (2-4-8-16-32Mbit/s, STM1 microwave links, Ethernet microwave)

¹⁴⁷ Authentication Centre (AUC) confirms the identity of SIM cards attempting to attach to the network.

¹⁴⁸ Telephony Application Server (TAS) manage voice services e.g. call forwarding, call wait and call transfer.

¹⁴⁹ Equipment identity register (EIR) provides IMEI verification services.

¹⁵⁰ Busy Hours (BH).

¹⁵¹ Base Station Controller (BSC) controls Base Transceiver stations (BTSs).

¹⁵² Radio Network Controller (RNC) is 3G equivalent of a BSC.

¹⁵³ Mobile Switching Centre (MSC) is a 2G core network element which controls the network switching subsystem elements.

¹⁵⁴ Synchronous transport module (STM) is a Fiber optic network transmission standard. It has a bit rate of 155.52 Mbit/s. Higher levels go up by a factor of 4 at a time.

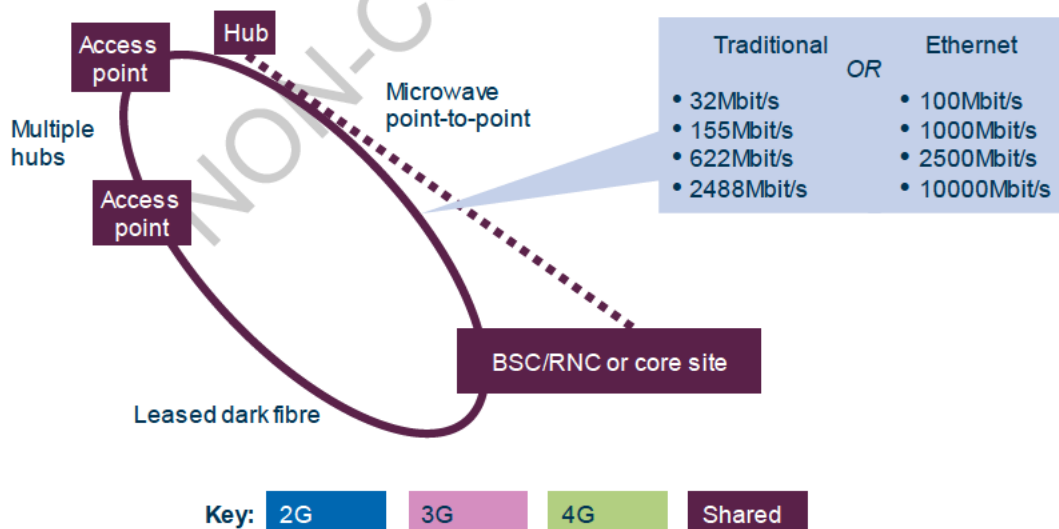
- leased fibre network (leased/dark fibre with either STM or Gbit/s fibre modems).

5.127 The choice of mobile network transmission varies among the actual mobile operators and can change over time. In the MTR Decision Model, AM models a modern mobile network transmission architecture. This implies a national fibre network for collecting and carrying traffic back to the main switching sites (assumed to be located at several geographically separate locations in Dublin) and carrying traffic between these sites.

5.128 While the choice between leasing managed STM or Gbit/s services and self-supply of transmission equipment is likely to vary by operator, AM assumed the hypothetical operator leases dark fibre and self-supplies transmission equipment. The model also assumes that backhaul is predominantly provided using microwave links with a smaller number of leased lines (in Dublin and smaller cities).

5.129 The LMA and hub to core transmission networks are common to all three radio network technologies. The model allows for capacity upgrades and the physical transmission infrastructure for both networks can be either leased lines or microwave links. Microwave links are deployed point-to-point but in the case of the hub to core transmission network the leased lines can be deployed in rings as shown in Figure 9:

Figure 9: Overview of the Modelled Transmission between Hubs and the Core Network



Source: MTR Decision Specification Document, Figure 6.5

- 5.130 Base Station Controllers (BSCs) and Radio Network Controllers (RNCs) aggregate 2G and 3G traffic respectively. In both cases, all urban radio traffic is routed through BSCs/RNCs in its own geotype, with the remaining traffic all routed through the dense urban geotype. There are capacity upgrades implemented in the MTR Decision Model for this level as well.
- 5.131 Some BSCs and RNCs are co-located with core nodes, but others are remote and so require BSC or RNC to core transmission links. The core network is assumed to be a ring within Dublin, with another ring to remote BSC/RNC locations. It carries a proportion of the data traffic and a proportion of the voice traffic.
- 5.132 Section 3.2.5 and Sections 6.3 to 6.7 of the MTR Decision Specification Document sets out a more detailed discussion of the modelling of the various transmission network deployments.

Network expenditure

- 5.133 Network element unit capex and opex costs need to reflect the costs that a mobile operator in Ireland would incur. For this reason, the values used in the MTR Decision Model have been based, to the maximum extent possible, on data collected from the Irish mobile network operators. Where data is absent, unavailable, or incomplete, it has been necessary for ComReg and its advisers to exercise complex judgments and appreciation as to the relevant inputs and costs associated with them. Where appropriate, such judgment has also been exercised in the light of experience in other jurisdictions.
- 5.134 The network design algorithms in the MTR Decision Model compute the assets (network elements) that are required to support a given demand in each year. A series of steps are then undertaken in order to arrive at the schedule of capex and opex over the modelling period. These steps include defining and quantifying the assets to be purchased in each year, deriving unit costs (capex and opex) for these assets, calculating unit cost trends over time and then applying the calculated costs to the computed network asset quantities each year to derive total capex and opex over time.
- 5.135 The model includes standard costs inputs for each asset category specifying an assumed lifetime, planning period, proportion of asset replaced per annum and opex as a proportion of capex for each category. The network design algorithms have to factor in a planning period to allow time for provisioning, installation, configuration and testing of the assets before they are activated.

- 5.136 As the cost of purchase of network assets varies over time, AM applied a MEA approach to provide the appropriate cost basis for purchase. Real-term unit asset cost trends are applied to 2017 unit asset costs to reflect the evolution of the modern technology unit asset costs over past and future time. In the MTR Decision Model AM largely applied the cost trends assumed in the 2016 MTR model.
- 5.137 Section 7 of the MTR Decision Specification Document sets out a more detailed discussion of the approach taken in the MTR Decision Model to calculate expenditure.

5.4.5 Implementation Related Parameters

- 5.138 A key issue to consider when implementing a BU cost model is the model structure. The purpose of the MTR Decision Model is to estimate the costs of a hypothetical efficient existing operator in Ireland based on the technologies and spectrum bands used by MNOs during the period of the price control.
- 5.139 To this end, the MTR Decision Model was developed using demand and network parameter information submitted by MSPs in response to SIRs, combined with estimates and calculations by AM, to calculate long-run incremental costs for mobile network operations in Ireland.
- 5.140 The MTR Decision Model is capable of deriving service costs using both LRAIC+ and pure LRIC principles. The AM Consultation Pricing Report recommended that the model be capable of calculating a pure LRIC cost as this is the primary purpose of the MTR Decision Model. However, having the ability to calculate a LRAIC+ cost allows a comparison of the total costs of the operator, rather than just the avoidable costs.

Increment

- 5.141 The requirement to calculate a pure LRIC cost for the purposes of setting MTRs necessitates that the wholesale termination increment be defined. The MTR Decision Model defines the increment for the wholesale MVCT service to comprise the following services:
- 2G domestic incoming to mobile voice minutes
 - 2G international/roaming (inbound) to mobile voice minutes
 - 3G domestic incoming to mobile voice minutes
 - 3G international/roaming (inbound) to mobile voice minutes
- 5.142 This service set is consistent with the 2009 Termination Rates Recommendation (Recommendation 6) which states that:

“Within the LRIC model, the relevant increment should be defined as the wholesale voice call termination service provided to third parties”.

5.143 See also Section 4.2.2 above for a discussion around the choice of increment.

Depreciation

5.144 The MTR Decision Model uses economic depreciation to determine the cost recovery of capital investments. A general overview of the treatment of economic cost recovery is provided in Section 4.3 of this document. For more details on this in relation to the MTR Decision Model see Section 3.4.2 and Section 8 of the MTR Decision Specification Document.

WACC

5.145 The calculation of the cost recovered in the MTR Decision Model needs to reflect the time value of money. In the MTR Decision Model this is accounted for by the application of a discount factor on future cash flows, and, as with the 2016 MTR model, AM based the discount factor on the regulated WACC (currently 8.63% as per ComReg decision D15/14) for MNOs.

5.146 Since the MTR Decision Model works in real 2017 EUR, the 8.63% figure for WACC was first transformed into a real-terms WACC over time by removing inflation (in the same way as in the 2016 MTR model). AM based inflation on the consumer price index (CPI).

5.147 The MTR Decision Model discounts costs recovered in the years after a network element is purchased by an amount equal to the WACC. This ensures that the cost of capital required for the network element is also returned to the operator.

Modelling timeframe

5.148 Under economic depreciation it is not necessary to recover specific investments within a particular time horizon (e.g. the lifetime of a particular asset), but rather throughout the lifetime of the business. Consequently, the time series, namely the period of years across which demand and asset volumes are calculated in the MTR Decision Model, should approximate the lifetime of the operator. Given that it is impractical to identify the lifetime of an operator AM assumed that the time series should be at least as long as the longest asset lifetime used in the MTR Decision Model.

5.149 Using a long time series:

- allows the consideration of all costs over time, providing the greatest clarity within the MTR Decision Model as to the implications of adopting economic depreciation;
- provides greater clarity on the recovery of all costs incurred from services;
and

- provides a wide range of information with which to understand how the costs of the modelled operator vary over time and in response to changes in demand or network evolution.

5.150 The 2016 MTR model had a modelling timeframe of 2003–2033 and ComReg believes it is reasonable to continue using 2003 as the assumed first year of the modelled operator. However, since the MTR Decision Model must also consider 4G deployments (which the MTR Decision Model assumes are deployed from 2013 onwards), there is merit in considering a longer timeframe than 2033, since 20 years after 2013 may be insufficient bearing in mind the long-run costs of the 4G network (particularly if additional sites are required).

5.151 For a cost model of mobile networks, the longest-lived assets (such as owned sites) are normally of the order of 25 years, and a longer modelling time series of 40–50 years is often used. The discounting of costs and revenues in years beyond this period would be such that any terminal value would be minimal. Therefore, ComReg is of the view that a modelling timeframe of 2003–2053 is appropriate for the MTR Decision Model.

Mark Up

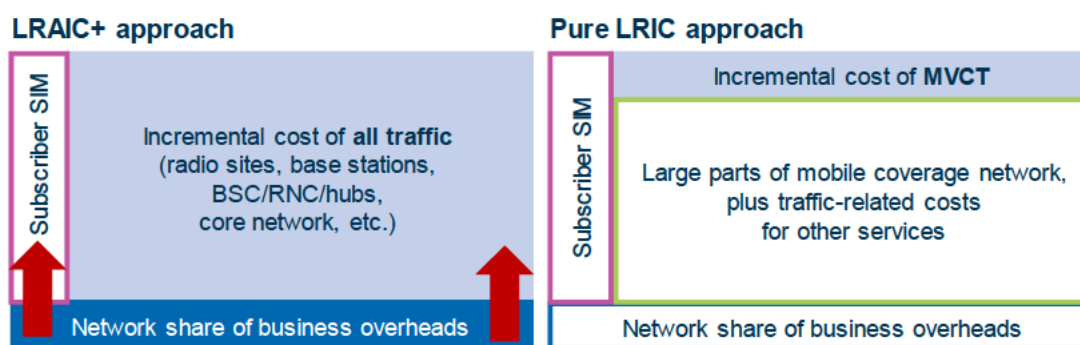
5.152 The 2009 Termination Rates Recommendation specifically excludes the recovery of non-incremental costs from voice termination. The pure LRIC calculation in the MTR Decision Model allows the recovery of the costs incurred solely due to provision of the services in the wholesale termination increment.

5.153 Therefore, the pure LRIC calculation excludes a mark-up for any common costs which would not be avoided if the wholesale voice call termination service was no longer supplied. However, the implementation of LRAIC+ in the MTR Decision Model does require the identification of non-incremental costs, i.e. costs that are common to more than one increment. Where common costs are not directly allocable to a service, an alternative allocation mechanism is required if the common costs are to be included in the final cost results from the MTR Decision Model. AM, in its MTR Decision Specification Document, sets out two approaches to allocate common costs:

- **Equi-proportionate mark-up (EPMU)** - In this method, the incremental cost of all increments is increased by the same percentage. The percentage is calculated as the ratio of total common costs to total incremental costs.
- **Ramsey Pricing** – In this method, the common costs are marked up on the incremental cost of all increments using a calculation that relies upon the elasticities of the various services consumed.

- 5.154 Having considered the practical difficulties of applying Ramsey pricing to mobile services, AM opted to use EPMU to mark up the LRAIC+ in the MTR Decision Model. Please see Section 3.4.5 of the MTR Decision Specification Document for a more detailed discussion of this topic.
- 5.155 Figure 10 below sets out the process employed by AM in developing the MTR Decision Model. This allows a comparison between the total costs of the network and the avoidable costs of MVCT.

Figure 10: Comparison of LRAIC+ with the Pure LRIC Approach



Source: MTR Decision Specification Document, Figure 9.3

- 5.156 In the LRAIC+ approach, business overheads are marked up onto each incremental service cost in an equi-proportionate manner, according to the ratio of common to incremental network costs. See Section 9.1 of the MTR Decision Specification Document for a more detailed explanation of this process.

ComReg's Opinion post Consultation – MTR Decision Model Inputs and Assumptions

- 5.157 ComReg was of the preliminary opinion that the cost model inputs and assumptions as set out in the Consultation were appropriate to determine a pure LRIC model for MTRs. ComReg asked in the Consultation if Respondents agreed with the proposed inputs and assumptions used in the development of proposed pure LRIC model (question 13). Issues were raised by Respondents relating to the market share of the operator used in the model, the forecast used of voice traffic, the inclusion of part of the spectrum fee as a direct cost of call termination, the suitability of the modelling timeframe, the choice of cost drivers, and the assumption that additional sites are used to provide voice services. ComReg, with the assistance of AM, has considered and replied to each issue raised, see paragraphs A 4.189 - A 4.209. Having taken into account the issues raised ComReg is of the opinion that the cost model inputs and assumptions used in the MTR Decision Model are appropriate to determine pure LRIC MTRs.

5.158 ComReg also asked if there was any more data relevant to the proposed model and that this data be provided to ComReg for consideration in the decision (question 14). Issues were raised concerning the updating of indirect capex mark-up and volume of opex as a proportion of capex, possible changes to worksheets in the model, and the correct modelling of the roll-out of a mixed voice and data network. ComReg, with the assistance of AM, has considered and replied to each issue raised, see paragraphs A 4.210 - A 4.222. Having reviewed the issues raised, ComReg considers that no changes are needed to the model arising from those issues. No more data relevant to the model was provided by operators.

5.4.6 Main Changes in the MTR Decision Model

5.159 The MTR Decision Model follows the same general approach as the 2016 MTR model and takes many inputs from its predecessor. There are some differences in the design and implementation of the MTR Decision Model when compared with the 2016 MTR model.

5.160 AM recommended incorporating the latest network and costing algorithms that are used in equivalent models developed in other jurisdictions. These include:

- Calculation of sites by type (single versus multi-technology)
- Improved modelling of transmission costs
- Modelling of data-congested 3G/4G networks
- Consideration of the networks without mobile-terminated voice according to best practice used in other jurisdictions
- Modelling of S-RAN

5.161 AM also recommended refining the geotype classifications with the result that the MTR Decision Model has five classifications whereas the 2016 MTR model had three. The MTR Decision Model also includes updated traffic forecasts and contains network/costs inputs that are calibrated to more recent operator data. The MTR Decision Model also explicitly models the costs of 4G services, technology and spectrum, whereas the 2016 MTR model assumed a share of data traffic would be carried over 4G but did not model the costs associated with 4G deployment.

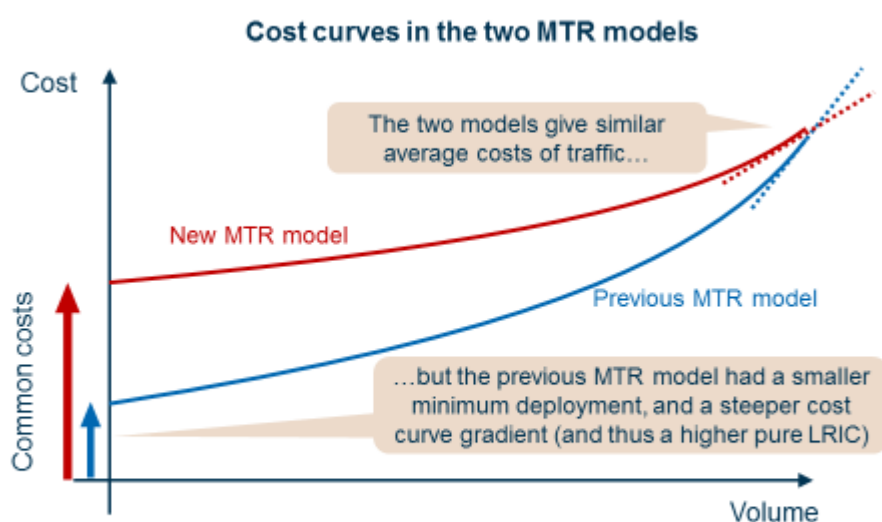
5.162 The MTR Decision Model includes more efficient technologies such as dual carrier high speed packet access ('**DC-HSPA**'), S-RAN and 4G. To better understand the impact of modifications in the MTR Decision Model AM undertook a "rollback" exercise by, for example:

- Switching off the functionality for S-RAN, 4G, cell breathing and DC-HSPA

- Reverting to the 2016 MTR model's assumptions regarding:
 - Population/demand over time
 - Spectrum allocations
 - Market share
 - Modelling period (2003-2033)
 - 2G/3G coverage and cell radii
 - Utilisation factors
 - Opex (i.e. 20% of capex in all cases)
 - Inflation

5.163 However, even allowing for this rollback exercise there are still differences in the two MTR models. This arise, at least in part, from the different implementations leading to different cost-volume relationships in the two MTR models. This effect is illustrated in the following chart:

Figure 11: Cost Curves in the 2016 MTR model and the MTR Decision Model



Source: Analysys Mason

5.164 As the chart indicates, even when the inputs in the MTR Decision Model are realigned with the inputs in the 2016 MTR model, there are still elements of the 2016 MTR model that use different formulae in areas such as network dimensioning, traffic routing and economic depreciation that mean it is not possible to completely “rollback” the MTR Decision Model to the 2016 MTR model, even though the pure LRIC arising from the partial “rollback” (euro cent 0.5 – 0.6) is higher and thus closer to the 2016 MTR model (euro cent 0.8).

5.165 The key differences from the 2016 MTR model that lead to different pure LRIC MTRs include:

- The 2016 MTR model had significantly larger maximum cell radii leading to smaller coverage networks and therefore more traffic sensitive equipment;
- The 2G network design in the 2016 MTR model leads to different number of coverage sites in the “with MVCT” and “without MVCT” scenarios. The effect is not present in the MTR Decision Model; and
- The 2016 MTR model included a peak-to-average ratio of 5 applied to voice traffic compared to 2 for data traffic, which increases the sensitivity of the network dimensioning algorithms to the removal of the MVCT increment.

5.166 Revising these parameters in the 2016 MTR model would lead to a reduction in the pure LRIC, for example, reducing the peak-to-average ratio for voice from 5 to 3, would reduce the derived pure LRIC for 2017 in the 2016 MTR model from euro cent 0.8 to euro cent 0.6.

5.4.7 MTR Cost Model Results

5.167 The MTR Decision Model calculates MTRs based on both LRAIC+ and pure LRIC principles – see Table 24 below

Table 24: LRIC and LRAIC modelled MTRs

		2016	2017	2018	2019	2020	2021	2022
Previous MTR Rate		0.84	0.82	0.79				
New Pure LRIC MTRs	Nominal euro cent	0.41	0.39	0.36	0.33	0.32	0.31	0.31
New Blended LRAIC+ Rates		1.28	1.25	1.20	1.16	1.13	1.12	1.11

5.168 The rates for 2019 – 2022 have increased marginally from the Consultation. This is due to demand updates to the model from the QKDR and a revision of the forecast of voice traffic.

5.4.8 Implementation of maximum regulated MTRs

5.169 As described in Section 3.7 the European Commission is planning (pursuant to the EECC)¹⁵⁵ to set a single European Union-wide MTR for all Member States (i.e., Eurorate MTRs) that is intended to come into effect in 2021. The European Commission is currently engaged in a project where one of the aims is to calculate the cost of mobile termination for each EU Member State. When the cost modelling has been completed, Eurorate MTRs will be calculated that will be based on the cost for each Member State weighted by the number of subscribers in each country as a percentage of all EU subscribers. The draft Eurorate MTRs will not be available until the end of 2019/start of 2020.

¹⁵⁵ Article 75 of the EECC Directive.

5.170 As the Eurorate MTRs will be based on a weighted average of relevant efficient costs across all EU countries, and as the LRIC rates calculated using ComReg's own cost model would be the lowest in Europe to date, ComReg is of the opinion that the possibility of operators having to decrease their MTRs pursuant to this Decision (by an appreciable percentage) and then having the ability to raise them again when Eurorate MTRs come into force could cause a disruptive impact on operators. ComReg therefore considers that a glide path approach to the MTRs calculated using the current MTR model would achieve the following:

- Reduce the possibility of disruption to operators; and
- Still achieve benefits for competition and consumers as there would be appreciable reductions in maximum regulated MTRs using a glide path approach.

5.171 Accordingly, ComReg has decided that a glide path based on LRIC termination rates as calculated in the current ComReg cost model will be used to set maximum regulated MTRs. These MTRs will remain in force until replaced by Eurorate MTRs¹⁵⁶.

5.172 The glide path for MTRs has been calculated using the rate of 0.79 euro cent per minute in 2018 as the starting point and the LRIC modelled rate of 0.31 euro cent per minute in 2022 as the end point (i.e. a period of four years for the glide path). The difference between the start point and end point of the glide path is 0.48 euro cent per minute. Dividing by 4 yields 0.12 euro cent per minute as the factor to reduce MTRs in each year along the glide path.

5.173 Based on the above the maximum MTRs set using a glide path will be as per the following Table 25:

Table 25: MTRs using Glide Path

	2019	2020	2021	From 2022
Maximum regulated MTR - nominal Euro cent per minute	0.67	0.55	0.43	0.31

5.174 The maximum regulated MTR for 2019 will be 0.67 euro cent per minute. This rate will take effect on the first working day of the month following two full calendar months after publication of this decision.

¹⁵⁶ The level of the Eurorate FTRs and Eurorate MTRs, and the manner of their implementation, is not known at present. ComReg will review developments in this regard and will consider appropriate revisions to, or revocations of, this Decision as necessary in light of the entry into force of Eurorate FTRs and MTRs.

5.4.9 ComReg's Opinion post Consultation – maximum MTRs, other issues and further comments

- 5.175 ComReg asked Respondents if they agreed with ComReg's preliminary views on the maximum regulated MTRs that MSPs with SMP should charge during the forthcoming price control period (Question 15). Issues were raised by Respondents regarding the use of a glide path and a re-evaluation of the proposed rates. ComReg, with the assistance of AM, has considered and replied to each issue raised, see paragraphs A 4.223 - A 4.234 . As explained above in paragraphs 5.169 to 5.171 ComReg has decided to implement the modelled LRIC for mobile termination through a glide path approach.
- 5.176 ComReg also asked Respondents if there were any other issues raised in the Consultation for which they would like to provide a response (Question 16). Issues were raised regarding the treatment of common costs and the effective date of the FTR Decision. ComReg had already discussed the issue of the treatment of common costs in its response to Question 2. ComReg has considered and responded to the other issue raised in paragraphs A 4.242 - A 4.243. ComReg agrees that for consistency the FTR Decision should come into effect on the same date as the MTR Decision.
- 5.177 ComReg asked if Respondents had any further comments to make on the proposed decision to impose a price control of cost orientation in the associated Market Review Consultation (Question 17). Neither of the two Respondents to this question had further comments to make.

Chapter 6

6 Regulatory Impact Assessment ("RIA")

6.1 Overview

- 6.1 A Regulatory Impact Assessment ("RIA") is an analysis of the likely effect of proposed new regulation or regulatory change. The RIA should help to identify regulatory options, and should establish whether the proposed regulation is likely to have the desired impact. The RIA is a structured approach to the development of policy, and it analyses the impact of regulatory options on various stakeholders.
- 6.2 A RIA should be carried out as early as possible in the assessment of potential regulatory options, where appropriate and feasible. The consideration of the regulatory impact facilitates the discussion of options, and a RIA should therefore be integrated into the overall preliminary analysis. This is the approach which ComReg follows in this Decision and this RIA should be read in conjunction with the overall Decision. This RIA is an update of the RIA in the Consultation having taken into account Submissions to the Consultation, and any comments from the European Commission.
- 6.3 ComReg's approach to the RIA is set out in the Guidelines published in August 2007 in ComReg Documents 07/56¹⁵⁷ and 07/56a¹⁵⁸. ComReg takes into account the RIA Guidelines¹⁵⁹, issued by the Department of An Taoiseach in June 2009 under the Government's Better Regulation programme. Section 13(1) of the Communications Regulation Act 2002 (as amended) requires ComReg to comply with Ministerial Policy Directions. Policy Direction 6 of February 2003¹⁶⁰ requires that, before deciding to impose regulatory obligations on undertakings, ComReg shall conduct a RIA in accordance with European and international best practice and otherwise in accordance with measures that may be adopted under the Government's "Better Regulation" programme.

¹⁵⁷ ComReg document 07/56 'ComReg's Approach to Regulatory Impact Assessment Response to Consultation and Guidelines' - https://www.comreg.ie/media/dlm_uploads/2015/12/ComReg_0756.pdf.

¹⁵⁸ ComReg document 07/56a 'Guidelines on ComReg's Approach to Regulatory Impact Assessment' - https://www.comreg.ie/media/dlm_uploads/2015/12/ComReg0756a.pdf.

¹⁵⁹ See "Revised RIA Guidelines How to Conduct a Regulatory Impact Analysis", June 2009. http://publicspendingcode.per.gov.ie/wp-content/uploads/2012/07/Revised_RIA_Guidelines_June_20091.pdf

¹⁶⁰ Ministerial Policy Direction made by the Minister for Communications, Marine and Natural Resources on 21 February 2003.

- 6.4 In conducting the RIA, ComReg has regard to the RIA Guidelines, while recognising that regulation by way of issuing decisions e.g. imposing obligations or specifying requirements in addition to promulgating secondary legislation may be different to regulation exclusively by way of enacting primary or secondary legislation. ComReg's ultimate aim in conducting a RIA is to ensure that all measures are appropriate, proportionate and justified. ComReg takes a common sense approach to ensure that a decision is proportionate and does not become overly burdensome. As decisions are likely to vary in terms of their impact, if after initial investigation, a decision appears to have relatively low impact ComReg may carry out a lighter RIA in respect of that decision.
- 6.5 The following sections, along with the analysis and discussion set out elsewhere in this Decision represents a RIA. It sets out an assessment of the potential impact of a further specification of a regulatory price control obligation of cost orientation that ComReg is imposing on the those Service Providers found to have SMP in the FVCT and MVCT Markets arising from the Market Review Decision.

6.2 Steps for Assessing Regulatory Options

- 6.6 In assessing the available regulatory options, ComReg's approach to the RIA is based on the following five steps:
- Step 1: describe the policy issue and identify the objectives
 - Step 2: identify and describe the regulatory options
 - Step 3: determine the likely impacts on stakeholders
 - Step 4: determine the likely impacts on competition
 - Step 5: assess the likely impacts and choose the best option.
- 6.7 Each step is discussed in detail below.

6.3 Step 1: Describe the Policy Issue and Identify the Objectives

- 6.8 Section 12(1)(a) of the Communications Regulation Act 2002 (as amended) states that ComReg's objectives in relation to the provision of electronic communications networks, services and associated facilities shall be:
- (i) To promote competition;
 - (ii) To contribute to the development of the internal market; and
 - (iii) To promote the interests of users with the Community.

- 6.9 Section 12(2) of the Communications Regulation Act 2002 (as amended) states that ComReg shall take all reasonable measures which are aimed at achieving those objectives, including, *inter alia*, in so far as the promotion of competition is concerned, ensuring that there is no distortion or restriction of competition in the electronic communications sector. ComReg's relevant statutory objectives are also set out in, *inter alia*, Regulations 8 and 13 of the Access Regulations (see further paragraph 6.18 below) and Regulation 16 of the Framework Regulations, which provides, *inter alia*, that ComReg shall promote regulatory predictability by ensuring a consistent regulatory approach over appropriate review periods, safeguard competition to the benefit of consumers and promote, where appropriate, infrastructure based competition.
- 6.10 The European Commission published its 2009 Termination Rates Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates on 7 May 2009. The 2009 Termination Rates Recommendation emphasises that regulated termination rates should be brought down to the costs of an efficient operator as soon as possible and that there should be a consistent application in all EU Member States.
- 6.11 The measures in this Decision should continue to provide legal certainty in this area and should ensure maximum benefit to consumers in terms of affordable prices and the efficient development of innovative services.
- 6.12 The 2009 Termination Rates Recommendation requires termination rates to be set based on long-run incremental costs (and recommends a "pure LRIC" approach). The 2009 Termination Rates Recommendation aims to address:
- Fundamental competitive distortions, substantial transfers between fixed and mobile markets and consumers, significant payments from smaller to larger competitors and high retail prices for originating calls and correspondingly lower usage rates, thus decreasing consumer welfare.
 - The regulatory uncertainty created by the lack of harmonisation in the setting of termination rates, which may deter potential investors, and imposes a regulatory burden on operators active in several EU Member States.
- 6.13 The development of the internal market and consistent regulatory practice are important factors for ComReg in the context of the measures assessed throughout this Decision and also as set out below. As recognised in the 2009 Termination Rates Recommendation, although cost orientation is generally provided for in most EU Member States, a divergence between price control measures has prevailed across the EU Member States. Significant divergences in the regulatory treatment of FTRs and MTRs create fundamental competitive distortions.

- 6.14 The 2009 Termination Rates Recommendation allows for asymmetric termination rates for new mobile entrants for a transitional period of up to four years where such entrants have objectively higher efficient costs and face impediments to reaching an efficient scale, so that they have sufficient time to recoup their higher incremental costs.
- 6.15 It has also been necessary for ComReg to consider the implications of the 2009 Terminations Rate Recommendation on related regulated markets where relevant. When pure LRIC is used to set prices for voice termination then common costs will not be recovered from that traffic.

6.4 Step 2: Identify and Describe the Regulatory Options

- 6.16 The regulatory options considered in the context of setting the FTRs and MTRs were as follows:
- Options on the various forms of cost orientation
 - Options for implementation of cost orientation
 - Options on implementation timelines
 - Options on symmetric Termination Rates
 - Options on recovery of common costs

6.4.1 Options on the Various Forms of Cost Orientation

- 6.17 The two options considered for cost orientation were:
- Pure LRIC
 - LRAIC+
- 6.18 These options were considered in light of ComReg's statutory objectives including Regulation 13(3) of the Access Regulation which states that ComReg 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. In accordance with Regulation 13, ComReg has also taken account of relevant investments made by operators and the requirement to allow a reasonable rate of return taking into account any risks involved specific to a particular new investment project.
- 6.19 These options were considered in detail in the Consultation in chapter 4 and also in the AM Consultation Pricing Report. These have been updated in the Decision in chapter 4 and in the AM Decision Pricing Report. The potential impact on the various stakeholders is discussed in more detail below.

6.4.2 Options for Implementation of Cost Orientation

6.20 There are two options in terms of implementing cost orientation:

- Cost modelling
- Benchmarking.

6.21 Regulation 13(3) of the Access Regulations states that ComReg shall ensure that any cost recovery mechanism or pricing methodology that it imposes serves to promote efficiency and sustainable competition and maximise consumer benefits. In this regard, ComReg may also take account of prices available in comparable competitive markets.

6.22 As noted in paragraph 1.5 of this Decision and in the AM Consultation Pricing Report, the High Court (in 2013) found that the benchmarking approach adopted by ComReg in the 2012 Pricing Decision for setting MTRs was outside the scope of what was provided for in the relevant EU and Irish legislation. AM therefore recommended against using benchmarking to implement cost orientation.

6.23 The cost modelling option is discussed in detail in this Decision in Chapter 4 and in the AM Decision Pricing Report.

6.4.3 Options on Symmetric Termination Rates

6.24 This Decision and the AM Decision Pricing Report both discuss the merits of using symmetric Termination Rates versus using asymmetric Termination Rates.

6.25 The 2009 Termination Rates Recommendation sets out that the rates for termination should be set on a symmetric basis unless an operator can justify higher costs on entry into the market. The potential impact of symmetry versus asymmetry on the various stakeholders is discussed in more detail below.

6.4.4 Options on Recovery of Common Costs

6.26 As discussed in Chapter 4 of this Decision, unavoidable common costs are not recovered under a pure LRIC approach.

6.27 As stated in paragraph 4.174, in the case of MSPs and FSPs, other than Eircom, these costs can be allocated to other services by operators as they see fit. Having considered the views of interested parties, ComReg is of the view that efficient costs unrecovered from Eircom's voice termination services could be recovered from other (regulated and unregulated) wholesale and/or retail voice/non-voice services as appropriate. ComReg has reviewed the returns in Eircom's Historical Cost Separated Accounts covering the financial years ending 2012 to 2018 and is of the view that the combined returns made between wholesale and retail services are sufficient to cover any under recovery of common costs for voice termination services.

6.5 Step 3: Determine the Likely Impacts on Stakeholders

6.28 This section summarises the potential impact of the proposed options, set out above in Section 6.4, on the various stakeholders for FVCT and MVCT.

6.29 The impact on stakeholders is discussed under the following headings:

- Mobile termination (impacts based on the options regarding the form and implementation of cost orientation including recovery of common costs)
- Fixed termination (impacts based on the options regarding the form and implementation of cost orientation including the recovery of common costs)
- Mobile termination (impacts based on the option of symmetry versus asymmetry)
- Fixed termination (impacts based on the option of symmetry versus asymmetry)

6.5.1 Mobile Termination (impacts based on the options regarding the form and implementation of cost orientation including the recovery of common costs) Option 1: Pure LRIC

Impact on Large Mobile Service Providers ¹⁶¹	Impact on Small Mobile Service Providers ¹⁶²	Impact on Fixed Service Providers
<p>1) Prior to this Decision MTRs were set using a BU pure LRIC model. This Decision continues with the use of a BU pure LRIC model to set MTRs. As explained in paragraph 2.22 ComReg has decided to use a glide path for the implementation of the rates from the MTR Decision Model. The new maximum MTRs are lower in value than those in force prior to this Decision (2019: 0.67 €cent/min, 2020: 0.55 €cent/min, 2021: 0.43 €cent/min compared with 0.79€ cent/min prior to this Decision). This will result in a reduction in call termination revenue for large MSPs – assuming the same volumes of traffic. However, this will also result in a reduction in the cost faced by MSPs associated with terminating calls on other networks (off-net calls). Using a glide path will decrease both the reduction in revenue and the reduction in cost compared to directly implementing the results of the MTR Decision Model.</p>	<p>1) The updated maximum MTRs are lower in value than the maximum MTRs in force prior to this Decision. This will result in a reduction in revenue for small MSPs – assuming the same volumes of traffic. Those MSPs that were not designated previously with SMP will face a higher relative reduction in their revenues.</p> <p>2) Lower MTRs will result in a reduction in the cost faced by MSPs associated with terminating calls on other networks (off-net calls). This impact is likely to be more significant for smaller MSPs, since a larger number of calls made from the smaller MSPs networks tend to be off-net.</p>	<p>1) Lower MTRs provide a benefit for fixed operators resulting from reduced out-payments to mobile networks for MVCT services.</p> <p>2) Lower MTRs may further encourage FSPs to be more innovative and flexible in devising retail plans and tariffs e.g. offering bundles that include more off-net calls. This might generate more fixed to mobile traffic, and further facilitate the development of combined fixed and mobile subscription bundles. LRIC based MTRs could allow FSPs to compete with MSPs in providing retail calls to mobile subscribers.</p>

¹⁶¹ Vodafone Ireland Limited, Three Ireland (Hutchinson) Limited and Meteor Mobile Communications Limited.

¹⁶² Lycamobile Ireland Limited, Tesco Mobile Ireland Limited and Virgin Media Ireland Limited.

Impact on Large Mobile Service Providers ¹⁶¹	Impact on Small Mobile Service Providers ¹⁶²	Impact on Fixed Service Providers
<p>2) Lower MTRs mean that MSPs may face a lesser risk of retail revenues being eroded by the cost of terminating off-net calls. This may further encourage MSPs to be more innovative and flexible in devising retail plans and tariffs e.g. offering bundles that include more off-net calls. Depending on the demand elasticity this could stimulate further usage and revenue opportunities for MSPs.</p> <p>3) MTRs based on pure LRIC mean that MSPs will only be able to recover efficiently incurred costs through their MTRs. This is likely to encourage MSPs to make efficient investments to reduce their costs. For example, by deploying new technology that reduces the cost of terminating traffic thus improving dynamic efficiency. Dynamic efficiency is further discussed in this Decision document and in the AM Decision Pricing Report.</p>	<p>3) Lower MTRs mean that MSPs may face a lesser risk of retail revenues being eroded by the cost of terminating off-net calls. This may further encourage MSPs to be more innovative and flexible in devising retail plans and tariffs e.g. offering bundles that include more off-net calls. Depending on demand elasticity this could stimulate further usage and revenue opportunities for MSPs.</p> <p>4) MTRs based on pure LRIC mean that MSPs will only be able to recover efficiently incurred costs through their MTRs. This is likely to encourage MSPs to make efficient investments to reduce their costs. This might be achieved for example by deploying new technology that reduces the cost of terminating traffic thereby improving dynamic efficiency. Dynamic efficiency is further discussed in this Decision and in the AM Decision Pricing Report.</p>	

Impact on Large Mobile Service Providers ¹⁶¹	Impact on Small Mobile Service Providers ¹⁶²	Impact on Fixed Service Providers
<p>4) Lower MTRs allow all MSPs to include more off-net calls in call bundles, and on that basis reduce TMNEs. These externalities might otherwise hold retail customers 'captive' to the MSP of their friends and family. Pure LRIC MTRs therefore enable retail customers of MSPs to switch to alternative MSPs without facing significantly increased costs associated with high off-net call costs.</p> <p>5) Lower MTRs could mean that large MSPs may face greater competition in the retail calls market from FSPs and smaller MSPs. The threat of competition should ensure that investment incentives faced by large MSPs will be preserved, despite lower termination revenue.</p> <p>6) Large MSPs will need to recover common costs from other retail/wholesale services and from their own customers, rather than subscribers of other MSPs. This should ensure that large MSPs are as efficient as possible, since they would not be able to transfer their own inefficiently incurred costs to other MSPs or FSPs.</p>	<p>5) Lower MTRs mean that it is cheaper for smaller MSPs to terminate calls on another mobile network (i.e. the cost of an off-net call). For this reason, smaller MSPs can more easily include off-net calls in (larger) call bundles and possibly converged fixed-mobile offers. This means that small MSPs should be able to compete for the individual customers of other MSPs. Given the reduced on-net/off-net price differentials for smaller MSPs, reduced TMNEs should benefit the smaller MSPs the most, since a larger portion of calls made on smaller networks are off-net.</p> <p>6) Lower MTRs should mean that small MSPs should be better able to compete, but may face greater competition in the retail calls market from FSPs and potentially other smaller MSPs. The threat of competition should ensure that investment incentives faced by all MSPs will be preserved, despite lower termination revenue.</p>	

Impact on Large Mobile Service Providers ¹⁶¹	Impact on Small Mobile Service Providers ¹⁶²	Impact on Fixed Service Providers
	<p>7) The pure LRIC approach means that the small MSPs cannot recover unavoidable common costs from mobile termination revenues. Therefore small MSPs will need to recover common costs from other retail/wholesale services and from their own customers, rather than subscribers of other MSPs. This should ensure that small MSPs are as efficient as possible, since they would not be able to transfer their own inefficiently incurred costs to other MSPs or FSPs.</p>	

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Impact on Consumers

Consumers: Mobile Network Low Spend	Consumers: Mobile Network High Spend	Consumers: Fixed Network
<ol style="list-style-type: none"> 1) Lower MTRs reduce the revenue available to MSPs from providing call termination. To accommodate lower per-customer termination revenue, MSPs may focus on attracting retail customer groups that generate more direct revenue. 2) MSPs incur significant fixed costs in building and operating a mobile network. The incremental cost of serving additional customers over the mobile network is relatively low. The incremental costs of receiving calls would be covered by a pure LRIC MTR, and therefore should not be borne by the receiving MSP or receiving retail customer. 3) Lower MTRs should facilitate lower off-net retail charges for outgoing calls. The implementation of the lower maximum regulated MTRs through a glide path might have a delaying impact on lower off-net retail charges for outgoing calls. 4) MSPs can design products in a way that extracts revenues from low spend customers. For example, by offering SIM only packages with off-peak minutes included (when spare capacity exists on the network). 	<ol style="list-style-type: none"> 1) Lower MTRs based on pure LRIC reduce the revenue available to MSPs from providing call termination. To accommodate lower per-customer termination revenue MSPs may focus on attracting retail customer groups that generate more direct revenue. 2) MSPs incur significant fixed costs in building and operating a mobile network. The incremental cost of serving additional customers over the mobile network is relatively low. The incremental costs of receiving calls would be covered by a pure LRIC MTR, and therefore should not be borne by the receiving MSP or receiving retail customer. 3) Lower MTRs should also facilitate lower off-net retail charges for outgoing calls. The implementation of the lower maximum regulated MTRs through a glide path might have a delaying impact on lower off-net retail charges for outgoing calls. 	<ol style="list-style-type: none"> 1) Lower MTRs should likely benefit all fixed consumers, including vulnerable user groups such as elderly fixed-only consumers (if the reduction in the wholesale cost of connecting fixed to mobile calls is passed on to fixed consumers). 2) Lower MTRs should facilitate further development of more innovative fixed calls packages such as products that include more bundled mobile minutes at a lower price. 3) Where fixed networks have increased funds available from reductions in outgoing wholesale termination payments, these may be used for important investments in network and service upgrades/innovations to the benefit of fixed consumers.

Consumers: Mobile Network Low Spend	Consumers: Mobile Network High Spend	Consumers: Fixed Network
<p>5) If MSPs were to recover their costs by increasing retail prices, MSPs may seek to recover some of the lost mobile termination revenue from low and high spend consumers (probably through reduced handset subsidies etc.). However, the aligning of Termination Rates to efficient cost should facilitate a more neutral competitive framework between FSPs and MSPs and between Service Providers of different sizes. Enhanced competition should help ensure that retail prices are set at a competitive level.</p> <p>6) Lower MTRs may further encourage MSPs to be more innovative and flexible in devising retail plans and tariffs e.g. offering bundles that include more off-net calls. Even if heavy users benefit more from these product offerings, low-usage customers can also benefit e.g. by receiving additional calls (i.e. benefits accrued via call externalities).</p> <p>7) Enhanced competition resulting from reduced TMNEs should facilitate lower retail prices and facilitate increased customer usage (depending on demand elasticity).</p> <p>8) Mobile handset subsidies may be reduced. This may increase the cost faced by mobile consumers in purchasing a mobile handset.</p>	<p>4) If MSPs were to recover their costs by increasing retail prices MSPs may seek to recover some of the lost mobile termination revenue from low and high spend consumers. However, the aligning of MTRs to efficient cost should facilitate a more neutral competitive framework between FSPs and MSPs and between Service Providers of different size. Enhanced competition should help ensure that retail prices are set at a competitive level.</p> <p>5) Lower MTRs may further encourage MSPs to be more innovative and flexible in devising retail plans and tariffs e.g. offering bundles that include more off-net calls.</p> <p>6) Enhanced competition resulting from reduced TMNEs should facilitate lower retail prices and facilitate increased customer usage (depending on demand elasticity).</p> <p>7) Mobile handset subsidies may be reduced. This may increase the cost faced by mobile consumers in purchasing a mobile handset.</p>	

Mobile Termination contd.

Option 2: LRAIC+

Impact on Large MSPs	Impact on Small MSPs	Impact on FSPs	Consumers
<p>1) MTRs based on a LRAIC+ pricing methodology are higher in price than MTRs based on pure LRIC. This is because LRAIC+ prices include a share of common costs. If a LRAIC+ MTR, based on the MTR Decision Model output of 1.14 €cent/min, were implemented this would represent an increase of 44% on the MTR of 0.79 €cent/min in force prior to this Decision.</p> <p>2) Therefore, LRAIC+ MTRs, compared to LRIC-based MTRs, would result in an increase in call termination revenues associated with incoming (off-net) calls for all MSPs.</p> <p>3) LRAIC+ MTRs would result in an increase in the cost faced by MSPs associated with terminating calls on other networks.</p> <p>4) LRAIC+ based MTRs are higher than pure-LRIC MTRs, and therefore may render it less attractive for larger MSPs to incorporate significant volumes of off-net mobile calls into call bundles and packages.</p>	<p>1) MTRs based on a LRAIC+ pricing methodology are higher in price than MTRs based on pure LRIC. This is because LRAIC+ prices include a share of common costs. If a LRAIC+ MTR, based on the MTR Decision Model output of 1.14 €cent/min, were implemented this would represent an increase of 44% on the MTR of 0.79 €cent/min in force prior to this Decision.</p> <p>2) Therefore, LRAIC+ MTRs, compared to LRIC-based MTRs, would result in an increase in call termination revenues associated with incoming (off-net) calls for all MSPs.</p> <p>3) LRAIC+ MTRs would result in an increase in the cost faced by MSPs associated with terminating calls on other networks.</p>	<p>1) MTRs based on a LRAIC+ pricing methodology are higher in price than MTRs based on pure LRIC. This is because LRAIC+ prices include a share of common costs.</p> <p>2) Under the LRAIC+ approach, FSPs would pay a higher MTR and therefore the out-payments to mobile networks would be higher than under a pure LRIC approach.</p>	<p>1) Please refer to the table above regarding the impacts of higher and lower MTRs on the consumer. The same general points are relevant in the context of assessing the LRAIC+ approach with some clarifications below.</p> <p>2) A higher wholesale MTR under LRAIC+ compared to a pure LRIC approach creates a higher floor for retail pricing and also implies lower flexibility to build innovative retail plans and tariffs e.g. offering bundles that include more off-net calls.</p>

Impact on Large MSPs	Impact on Small MSPs	Impact on FSPs	Consumers
<p>5) Under a LRAIC+ approach MSPs can recover some of the common costs which cannot be recovered from MTRs under a pure LRIC approach – if they have greater call termination revenues than call termination fees paid to other Service Providers.</p> <p>6) LRAIC+ based MTRs may mean that large MSPs face a lesser degree of competition (relative to pure LRIC MTRs) from other MSPs in the provision of mobile calls. For example, it would be easier for large MSPs to retain customers by offering cheap on-net calls because the relative price of off-net calls to each MSP would be higher. On the other hand, it would be more difficult to win individual customers from other large MSPs.</p>	<p>4) Higher MTRs (by virtue of LRAIC+ pricing) compared with pure LRIC means that the margins of small MSPs would be partly eroded by the cost of terminating off-net calls. This cost is significant for small MSPs, since a large proportion of their calls are off-net. This may limit the extent to which MSPs can be innovative and flexible in devising retail plans and tariffs e.g. by limiting their ability to provide retail customers with off-net calls at a competitive price. This means that (compared with pure LRIC pricing) small MSPs would find it more difficult to compete for the individual customers of other MSPs due to a degree of TMNEs.</p> <p>5) Under a LRAIC+ approach, smaller MSPs can recover common costs from their MTRs, which cannot be recovered from MTRs under a pure LRIC approach - if they have greater call termination revenues than call termination fees paid to other Service Providers.</p>	<p>3) LRAIC+ based MTRs (compared with pure LRIC prices) may limit the extent to which FSPs can be innovative and flexible in devising retail plans and tariffs that include calls to mobile networks e.g. by limiting their ability to provide retail customers with off-net calls at a competitive price.</p>	<p>3) TMNEs are likely to be more pronounced under LRAIC+ than under pure LRIC. This may limit competitively driven retail price and service innovations compared to a more competitively neutral framework facilitated by a pure LRIC approach.</p> <p>4) Consumers who make high volumes of off-net calls would benefit less from LRAIC+ compared to pure LRIC (assuming that in each case the relevant reduction in MTR is passed through to the consumer).</p>

6.5.2 Fixed Termination (impact based on the options regarding the form and implementation of cost orientation including recovery of common costs)

Option 1: BU pure LRIC Model for Eircom and other SMP FSPs

Eircom	Impact on Other FSPs	Impact on MSPs	Consumers
<p>1) FTRs based on a pure LRIC pricing methodology are lower than LRAIC+ FTRs.</p> <p>2) The maximum FTRs, implemented using a glide path, arising from this Decision are lower than the prior maximum FTRs (2019: 0.063 €cent/min, 2020: 0.057 €cent/min, 2021: 0.051 €cent/min compared to €0.072 €cent/min prior to this Decision). This will result in a reduction in call termination revenues associated with incoming (off-net) calls for Eircom for the same level of traffic.</p> <p>3) However, in overall revenue terms FVCT is a relatively small component of Eircom’s fixed revenues.</p> <p>4) Lower maximum FTRs results in a reduction in the cost faced by Eircom associated with terminating calls on other FSPs (off-net calls).</p> <p>5) The pure LRIC approach for setting FTRs only allows for the recovery of efficiently incurred costs. Therefore, pure LRIC-based FTRs should encourage Eircom to make efficient investments in order to reduce its costs of providing FVCT.</p>	<p>1) FTRs based on a pure LRIC pricing methodology are lower than LRAIC+ FTRs.</p> <p>2) The maximum FTRs, implemented using a glide path, arising from this Decision are lower than the prior maximum FTRs (2019: 0.063 €cent/min, 2020: 0.057 €cent/min, 2021: 0.051 €cent/min compared to €0.072 €cent/min prior to this Decision.) This will result in a reduction in call termination revenues associated with incoming (off-net) calls for other FSPs.</p> <p>3) However, FVCT is a relatively small component of other FSPs’ revenues.</p> <p>4) Lower maximum FTRs result in a reduction in the cost faced by FSPs associated with terminating calls on other FSPs (off-net calls), particularly calls to Eircom’s network.</p>	<p>1) The pure LRIC approach represents a benefit for MSPs of reduced out-payments to fixed networks for FVCT services compared to a LRAIC+ approach.</p> <p>2) The lower maximum FTRs arising from this Decision will result in reduced costs for MSPs associated with calls to FSP networks – for the same volume of calls.</p>	<p>1) Lower maximum FTRs may further facilitate the development of more innovative fixed calls packages such as products that include more off-net bundled call minutes to fixed numbers at a lower price.</p> <p>2) Lower maximum FTRs should give rise to greater retail pricing flexibility and a continued downward momentum in retail prices. This depends on the level of pass through of reductions in FTRs to the consumer.</p> <p>3) Enhanced competition resulting from any reduced TMNEs may result in lower retail prices and potentially facilitate increased customer usage.</p>

Eircom	Impact on Other FSPs	Impact on MSPs	Consumers
<p>6) The pure LRIC approach for FTRs should facilitate a more efficient distribution of financial transfers between Service Providers and thereby contribute to a level playing field between all FSPs and MSPs (including Eircom).</p> <p>7) Pure LRIC-based FTRs do not allow Eircom to recover unavoidable common costs from regulated wholesale termination charges.</p>	<p>5) The pure LRIC approach for setting FTRs only allows for the recovery of efficiently incurred costs. Therefore the pure LRIC-based FTRs should encourage FSPs to make efficient investments in order to reduce their costs of providing FVCT.</p> <p>6) The pure LRIC approach for FTRs should facilitate a more efficient distribution of financial transfers between Service Providers and thereby contribute to a level playing field between all FSPs and MSPs (including other FSPs).</p> <p>7) Pure LRIC-based FTRs do not allow FSPs to recover unavoidable common costs from the regulated wholesale termination charge. FSPs would instead need to recover common costs through other retail and wholesale services. This should provide incentives for these FSPs to maximize efficiency in the provision of FVCT, since they would be unable to transfer their own inefficiently incurred costs to other MSPs or FSPs (as would be allowed under a LRAIC+ FTR approach).</p>		

Fixed Termination (continued)

Option 2: BU LRAIC+ Model for Eircom and other SMP FSPs

Eircom	Impact on other FSPs	Impact on MSPs	Consumers
<p>1) FTRs based on LRAIC+ are higher than pure LRIC FTRs. If a LRAIC+ FTR, based on the FTR Decision Model output of 0.487 €cent/min, were implemented this would represent an increase of 576% on the MTR of 0.072 €cent/min in force prior to this Decision.</p> <p>2) Therefore, LRAIC+ FTRs would result in an increase in call termination revenue associated with incoming (off-net) calls for Eircom.</p> <p>3) However, FVCT is a relatively small component of Eircom's fixed revenues.</p> <p>3) LRAIC+ based FTRs would result in Eircom facing higher out-payments when terminating calls on other FSP networks (compared with pure LRIC FTRs).</p> <p>4) Unlike the pure LRIC pricing methodology, LRAIC+ based FTRs would allow Eircom to recover some common costs from other Service Providers through FTRs. Eircom would therefore potentially face lesser incentives to improve efficiency and reduce costs (particularly common costs).</p>	<p>1) FTRs based on LRAIC+ are higher than pure LRIC FTRs. If a LRAIC+ FTR, based on the FTR Decision Model output of 0.487 €cent/min, were implemented this would represent an increase of 576% on the MTR of 0.072 €cent/min in force prior to this Decision.</p> <p>2) Therefore, LRAIC+ FTRs would result in an increase in call termination revenue associated with incoming (off-net) calls for other FSPs.</p> <p>3) However, FVCT is a relatively small component of the other FSPs' revenues.</p> <p>4) LRAIC+ based FTRs would result in an FSP facing higher out payments when terminating calls on Eircom and other FSP networks (compared with pure LRIC FTRs).</p>	<p>1) Under the LRAIC+ approach, MSPs would have higher out payments costs to FSPs, compared with the pure LRIC approach.</p>	<p>1) A higher FTR under LRAIC+ compared to pure LRIC creates a higher floor for retail pricing and also implies lower flexibility to build innovative retail plans and tariffs e.g. offering bundles that include more off-net calls.</p> <p>2) Consumers who make high volumes of off-net calls would benefit less from LRAIC+ compared with pure LRIC (assuming that in each case the relevant reduction in off-net FTRs is passed through to the consumer).</p>

Eircom	Impact on other FSPs	Impact on MSPs	Consumers
	<p>5) Unlike the pure LRIC pricing methodology, LRAIC+ based FTRs allow FSPs to recover some common costs from other Service Providers through FTRs. FSPs other than Eircom would therefore potentially face lesser incentives to improve efficiency and reduce costs (particularly common costs).</p>		

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6.5.3 Mobile Termination (impacts based on the option of symmetry versus asymmetry)

Option 1: Symmetric Mobile Termination Rates

Impact on Large MSPs	Impact on Small MSPs	Impact on FSPs	Consumers
<p>1) Symmetric MTRs facilitate a level playing field which removes potential impediments to competition. For example, symmetric MTRs mean that MSPs do not risk incurring higher MTRs charged by competing networks and thus potentially reduces incentives for TMNEs. This is particularly so in the case of symmetric MTRs set at a pure LRIC level.</p> <p>2) Symmetric MTRs based on pure LRIC should help promote dynamic efficiency because they prevent inefficient MSPs from recovering inefficiently incurred costs from their competitors through MTRs.</p> <p>3) A symmetric MTR is simpler from a billing and retail product design perspective.</p>	<p>1) Since one small MSP (Virgin Media) currently has a MTR of 2.6 €cent/min (i.e. an asymmetric MTR), a move to symmetric pure LRIC MTRs would reduce the mobile termination revenues of that MSP.</p> <p>2) Symmetry means that the out-payments for the smaller MSP with higher MTRs would also reduce. However, the out-payments would not reduce as significantly as the wholesale revenues would for that smaller MSP (assuming equal amount of incoming and outgoing calls to and from mobile networks).</p> <p>3) Symmetric MTRs facilitate a level playing field by potentially removing impediments to competition. For example, symmetric MTRs reduce incentives for large MSPs to invoke TMNEs. This is particularly so in the case of symmetric MTRs set at a pure LRIC level.</p>	<p>1) Symmetric MTRs mean that FSPs benefit from having to make lower out-payments to MSPs, particularly to those smaller MSPs that have charged higher asymmetric MTRs to date.</p> <p>2) A symmetric MTR is simpler from a billing and retail product design perspective.</p> <p>3) Symmetric MTRs provide greater certainty for FSPs in designing retail products that include bundled minutes to mobile numbers. This in turn provides more flexibility for FSPs to design retail packages that include larger or even unlimited off-net bundles and possibly converged fixed-mobile offers. This is particularly so in the case of symmetric MTRs set at a pure LRIC level.</p>	<p>1) For the reasons discussed in this table, symmetry at pure LRIC or LRAIC-plus based MTRs is likely to promote competition and dynamic efficiency, and therefore offer broad benefits to consumers in terms of promoting competition.</p>

Impact on Large MSPs	Impact on Small MSPs	Impact on FSPs	Consumers
	<p>4) Symmetric MTRs based on pure LRIC should help promote dynamic efficiency because they prevent inefficient MSPs from recovering inefficiently incurred costs from their competitors through MTRs.</p> <p>5) A symmetric MTR is simpler from a billing and retail product design perspective.</p>		

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Mobile Termination (continued)

Option 2: Asymmetric Mobile Termination Rates

Impact on Large MSPs	Impact on Small MSPs	Impact on FSPs	Consumers
<p>1) Asymmetric MTRs can allow less efficient MSPs to recover inefficiently incurred costs from large MSPs through the imposition of MTRs.</p> <p>2) Large MSPs are therefore worse off under an asymmetric pricing approach, compared with small MSPs, assuming it is the small operators that implement the larger asymmetric MTRs.</p>	<p>1) Asymmetric MTRs may enable small MSPs to recover additional costs through MTRs (potentially subsidising retail prices initially). This could encourage entry and competition in the short term. However, asymmetric MTRs typically lead to an increase in off-net retail tariffs, which in turn cause TMNEs.</p> <p>2) Higher asymmetric MTRs allow less efficient MSPs to recover inefficiently incurred costs from competitors in the retail mobile calls market through the imposition of MTRs.</p>	<p>1) Asymmetric MTRs allow less efficient MSPs to recover inefficiently incurred costs from FSPs through the imposition of MTRs.</p> <p>2) Asymmetric MTRs mean that the FSPs may not have as much incentive to compete for calls to mobile telephone numbers since calls to certain mobile networks will carry a higher cost.</p> <p>3) Asymmetric MTRs provide less certainty for FSPs in designing retail products that include bundled minutes to mobile numbers, since calls to certain mobile networks would carry a higher cost. This may discourage FSPs from offering bundles that include fixed to mobile calls.</p>	<p>1) Higher rates through asymmetry may not be beneficial to consumers in terms of promoting competition.</p> <p>2) Large MSPs are likely to respond to asymmetric pricing by imposing higher tariffs for off-net calls, which can act as a barrier to entry/expansion in the retail market, and impose switching costs on consumers when changing Service Providers.</p> <p>3) Where inefficiently incurred costs are passed on from inefficient MSPs to other MSPs through MTRs, these costs are ultimately likely to be passed on to consumers through higher retail prices.</p>

6.5.4 Fixed Termination (impacts based on the option of symmetry versus asymmetry)

Option 1: Symmetric Fixed Termination Rates

Eircom	Impact on other FSPs	Impact on MSPs	Consumers
<p>1) Eircom currently charges a lower FTR than some other FSPs, and therefore is likely to be a net beneficiary of symmetric FTRs. Out-payments for termination of calls on other FSP networks would be likely to reduce.</p> <p>2) Symmetric FTRs create a level playing field which removes potential impediments to competition (for example, symmetric FTRs mean that Eircom no longer risks incurring higher FTRs charged by competing networks).</p> <p>3) Pure LRIC based symmetric FTRs should promote competition for larger FSPs, such as Eircom, because such FTRs prevent less efficient FSPs from recovering inefficiently incurred costs from competitors.</p> <p>4) A symmetric FTR is simpler from a billing and retail product design perspective.</p>	<p>1) A number of smaller FSPs currently charge a higher FTR (than Eircom), and therefore are likely to be worse off as a result of symmetric FTRs. In particular, revenues would be likely to reduce more than out-payments (assuming traffic flows remain constant).</p> <p>2) Symmetric FTRs create a level playing field which removes potential impediments to competition (for example, symmetric FTRs mean that FSPs no longer risk incurring higher FTRs charged by competing networks).</p> <p>3) Pure LRIC based symmetric FTRs should promote competition for the benefit of efficient FSPs because it prevents inefficient FSPs from recovering inefficiently incurred costs from Eircom or other competitors through FTRs.</p> <p>4) A symmetric FTR is simpler from a billing and retail product design perspective.</p>	<p>1) Symmetric FTRs mean that MSPs benefit from having to make lower out-payments to FSPs for off-net calls.</p> <p>2) A symmetric FTR is simpler from a billing and retail product design perspective.</p>	<p>1) For the reasons discussed in this table, symmetry at pure LRIC is likely to promote competition, and therefore offer broad benefits to consumers in terms of promoting efficiency and competition.</p>

Fixed Termination (continued)

Option 2: Asymmetric Fixed Termination Rates

Eircom	Impact on Other FSPs	Impact on MSPs	Consumers
<p>1) Asymmetric FTRs may allow less efficient FSPs recover inefficiently incurred costs from Eircom through FTRs.</p>	<p>1) Asymmetric FTRs may enable small FSPs to recover additional costs through FTRs (potentially subsidising retail prices initially). This could encourage entry and competition in the short term. However, asymmetric FTRs may ultimately lead to an increase in off-net retail tariffs, which in turn cause TMNEs. This may pose a barrier to entry and growth for small FSPs and new entrants when competing with large FSPs for retail customers.</p> <p>2) Higher asymmetric FTRs allow less efficient FSPs recover inefficiently incurred costs from competitors in the retail calls market through the imposition of FTRs.</p>	<p>1) Higher asymmetric FTRs allow less efficient FSPs recover inefficiently incurred costs from MSPs through the imposition of FTRs.</p> <p>2) Asymmetric FTRs provide less certainty for MSPs in designing retail products that include bundled minutes to fixed numbers, since calls to certain fixed networks would carry a higher cost.</p>	<p>1) Higher FTRs through asymmetry may not be beneficial to consumers in terms of promoting efficiency and competition.</p>

6.6 Step 4: Determine the Likely Impacts on Competition

Competition in general

- 6.30 Chapter 4 of this document discusses competition problems in the light of the various options available. Section 3.2 of the AM Decision Pricing Report discusses in detail the competitive issues associated with two-sided markets and how this explains the impact of wholesale termination on the level of competition in fixed and mobile telecoms markets.

LRIC vs LRAIC+ cost increment

- 6.31 Since pure LRIC only includes the incremental costs of call termination, the pure LRIC approach produces lower costs for FVCT and MVCT than the LRAIC+ for the corresponding service. MTRs derived using pure LRIC enable smaller MSPs to compete more easily with larger MSPs whereas MTRs that exceed incremental cost e.g. based on LRAIC+ can lead to more pronounced TMNEs, which may cause inertia in the retail market, and make it difficult for smaller MSPs to win customers from large MSPs. MTRs based on pure LRIC lower the floor for the retail pricing of off-net calls which strengthens the ability of smaller MSPs to construct competitive packages. This easing of barriers to entry/expansion (that are associated with large financial transfers at wholesale level and TMNEs at retail level) therefore facilitates a more competitively neutral framework.
- 6.32 Similarly, pure LRIC based MTRs reduce the cost faced by FSPs for terminating calls on mobile networks. Pure LRIC based MTRs better enable FSPs to offer packages that include bundled mobile minutes. Pure LRIC based MTRs are also conducive to the development of converged fixed and mobile products with inclusive 'any network' voice bundles.
- 6.33 ComReg considers that these combined impacts create a more competitively neutral environment which facilitates increased competition in mobile and fixed retail voice markets.
- 6.34 In terms of fixed–fixed competition pure LRIC based FTRs facilitate development of more innovative fixed calls packages, such as products that include more off-net bundled call minutes to fixed numbers at a lower retail price. Since pure LRIC based FTRs result in lower outpayments to other FSPs for FVCT, they give rise to greater retail pricing flexibility and a continued downward momentum in retail prices of calls to fixed numbers (depending on the level of pass-through).
- 6.35 In general, ComReg considers that a pure LRIC approach for Termination Rates facilitates a more efficient distribution of financial transfers between Service Providers and thereby contributes to a level playing field between all FSPs and MSPs. Pure LRIC based Termination Rates remove the opportunity for MSPs and FSPs to recover inefficiently incurred common costs from their competitors.

- 6.36 The competitive effects of pure LRIC, compared with LRAIC+, may differ across customer groups. Since the termination revenue per customer is lower under pure LRIC, FSPs and MSPs rely more on direct spend of customers to cover common costs. For this reason, FSPs and MSPs have the ability to manage a greater proportion of cost recovery through their practice of segmenting different user groups using indicators such as affordability and willingness to pay. However, ComReg considers that operators will still compete for low-spend customers due to the economies of scale associated with fixed and mobile networks, and network effects (externalities), both of which attribute value to amassing scale.
- 6.37 ComReg considers that symmetric Termination Rates create a level playing field which removes potential impediments to competition (for example, symmetric MTRs means that large MSPs no longer risk incurring higher MTRs charged by competing networks). Symmetry, in particular at the level of pure LRIC, also removes TMNEs, and therefore reduces switching costs faced by retail customers thereby facilitating the competitive process. Symmetric FTRs and MTRs also prevent inefficient FSPs or MSPs from passing on inefficiently incurred costs to other FSPs and MSPs, thereby enabling efficient FSPs and MSPs to compete more effectively in the retail markets.

6.7 Assess the Likely Impacts and Choose the Best Option

6.7.1 Fixed Termination

- 6.38 The preferred approach, having considered the Submissions to the Consultation, is for setting FTRs by means of a BU pure LRIC model. This is consistent with the 2009 Termination Rates Recommendation and ComReg's statutory objectives and, based on the impact assessment above, should not create a disproportionate burden on SMP FSPs given that regulated FTRs are already set using a BU pure LRIC model. In addition, setting FTRs at pure LRIC will only have a marginal impact on FSP revenue flows because it is a very small component of overall fixed revenues.
- 6.39 The BU pure LRIC model for FVCT is based on information obtained from Eircom and other FSPs (where available) in response to SIRs and adjusted to reflect the cost of FVCT for an efficient operator. The proposed cost modelling option is considered appropriate for setting the FTRs of Eircom and the other SMP FSPs given that an existing core model already exists for the fixed network. ComReg used the NGN Core Model, and added on a section for FVCT. This allowed pure LRIC FTRs to be calculated.

- 6.40 As discussed in Chapter 5, section 5.3.9 ('ComReg's Final Position – maximum FTRs), due to the uncertainty arising from the imposition of Eurorates expected in 2021, ComReg has decided to implement the maximum regulated FTRs calculated by FTR Decision Model using a glide path. ComReg considers that, due to the difference between the current maximum regulated FTR and the maximum regulated FTRs arising from this Decision, consumers and competition will benefit while fixed operators may have more stability in prices.

6.7.2 Mobile Termination

- 6.41 ComReg's preferred approach, having considered the Submissions to the Consultation, is for setting MTRs based on a BU pure LRIC model. This is consistent with ComReg's statutory objectives and the 2009 Termination Rates Recommendation and, based on the impact assessment above, this should not create a disproportionate burden on SMP MSPs given that current regulated MTRs have already been set using a BU pure LRIC model and the updated MTRs reflect developments in markets and costs since the previous model. As previously discussed, due to the uncertainty regarding the level of the Eurorate MTR in 2021, ComReg has decided to implement the results of the output of the MTR Decision Model using a glide path.
- 6.42 ComReg considers that in a dynamic context the overall impact of the pure LRIC approach for MVCT is positive in terms of mobile-to-mobile competition, as it facilitates a more competitively neutral framework for smaller MSPs to compete in. In addition, the proposed approach is positive for fixed-to-mobile competition by lowering the revenues paid by FSPs to MSPs and by allowing more competitive innovative offerings such as the inclusion of calls to mobiles in fixed call bundles. These positive results should therefore be to the benefit of consumers. Furthermore, to the extent that customer usage increases as a result of competition rendering calls more affordable, this would facilitate additional revenue opportunities for MSPs.
- 6.43 ComReg considers that, due to the difference between the current maximum regulated MTR and the maximum regulated MTRs arising from this Decision, consumers and competition will benefit while mobile operators will have more stability in prices.

6.7.3 Symmetry versus Asymmetry

- 6.44 ComReg considers that the preferred approach is that all SMP FSPs and MSPs should be subject to a symmetric pure LRIC FTR and a symmetric pure LRIC MTR respectively. This is in line with the 2009 Termination Rates Recommendation. It is also the approach recommended by our consultants AM.
- 6.45 ComReg proposed that symmetric MTRs should apply to all of the current SMP MSPs (MNOs and MVNOs) that ComReg proposed in the Market Review Consultation to designate with SMP. Of those MSPs the MNOs have been in the market for more than four years. ComReg is of the opinion that there is no justification for MTRs above the symmetric level for those MNOs. As regards the MVNOs, ComReg remains of the opinion that, in general, it is difficult to envisage a scenario as to why, absent any objective exogenous cost differences, an MVNO could be justified in levying an MTR that differs from that of its host network, particularly as the MVNO has obtained the scale economy advantages accruing to the host network.
- 6.46 The 2009 Termination Rates Recommendation allows for asymmetric rates for new entrants for a transitional period of up to four years, so that new entrants have sufficient time to recoup their higher incremental costs. However, ComReg considers that any asymmetry will only be allowed in exceptional circumstance where there is clear evidence of objectively higher costs and a sufficient economic rationale that demonstrates that such asymmetry would be in the interests of competition and consumers in the long term. Please refer to Chapter 4 of this consultation document for further details on symmetry.
- 6.47 The impact on the various stakeholders in terms of symmetry and asymmetry has already been assessed above. While a move from asymmetric MTRs for smaller MSPs will result in a reduction of their wholesale revenues, symmetry should provide competition benefits with associated revenue opportunities in the medium to long-term. Asymmetric MTRs may encourage or support entry and competition in the short term, but in the medium/long-term, symmetry reduces the scope for TMNEs by removing some of the justification for higher off-net retail charges. Therefore, symmetric MTRs should facilitate greater competition in the long-term. When small MSPs charge asymmetric MTRs, it provides larger MSPs with a justification for TMNEs. These impose switching costs on consumers, which favour larger MSPs, and act as a barrier to entry/expansion in the retail markets.
- 6.48 The impact on FSPs will not be significant in terms of moving to symmetric FTRs given that the FSPs already charge relatively low FTRs.

6.7.4 Recovery of Common Costs

- 6.49 ComReg considers that it is important to identify the amount of common costs unrecovered from voice call termination services (given the pure LRIC approach).
- 6.50 This has been discussed in Chapter 4 of this decision document with a summary of ComReg's views set out below.
- 6.51 For the SMP FSPs (excluding Eircom) and the SMP MSPs, which are not regulated across other markets, ComReg considers that they should have discretion to recover the costs from other wholesale services or to recover them from retail services.
- 6.52 Having considered the views of interested parties, ComReg is of the view that efficient costs unrecovered from Eircom's voice termination services could be recovered from other (regulated and unregulated) wholesale and/or retail voice/non-voice services as appropriate. ComReg has reviewed the returns in Eircom's Historical Cost Separated Accounts covering the financial years ending 2012 to 2018 and is of the view that the combined returns made between wholesale and retail services are sufficient to cover any under recovery of common costs for voice termination services.

6.8 Monitoring and Compliance

6.8.1 Complying with the Price Controls

- 6.53 ComReg, through the Market Review Decision, is imposing price control obligations of cost orientation on FSPs and MSPs found to have SMP in their respective markets and, through this Decision, basing those obligations on a pure LRIC methodology. The price control obligations mean that, at certain dates, as defined in decision instruments arising from the Market Review Decision and this Decision, those FSPs and MSPs will need to have ensured that their FTRs and MTRs respectively, will be priced at or below those prices set out in the Decision Instruments. ComReg considers that the proposed transparency obligations regarding amendments to Termination Rates, as set out in the decision instruments in the Market Review Decision, will ensure compliance with the proposed price controls.

6.8.2 Monitoring

- 6.54 ComReg will request confirmation from the FSP or MSP, at the dates where publication of new prices is due.

6.8.3 Enforcement Measures and Sanctions

6.55 Where there is *prima facie* evidence that a FSP or MSP has not complied with a price control obligation, ComReg will initiate a compliance investigation. Where justified, ComReg will take relevant enforcement action pursuant to either Regulation 19 or Regulation 21 of the Access Regulations.

6.8.4 Views on RIA

6.56 In the Consultation ComReg asked Respondents (question 18) if they had any views on the Regulatory Impact Assessment. ComReg also asked if there were other factors that ComReg should consider in completing its Regulatory Impact Assessment (question 18). Issues were raised by Respondents directly and indirectly saying the RIA was qualitative and speculative in nature, that consideration should be given as to how fixed and common costs are recovered and that the RIA did not consider the challenges faced by MVNOs. The Responses are considered in paragraphs A 4.251 - A 4.263 above. As detailed in those paragraphs ComReg considers that the RIA is a full assessment of the impacts of the using LRIC based termination rates on stakeholders (operators, consumers) and on competition. ComReg has considered the recovery of common costs in its response to Submissions concerning question 2. The challenges faced by MVNOs have been dealt with in the Market Review Decision in paragraph A11.135.

Annex: 1 Decision Instrument: Fixed Voice Call Termination

DECISION INSTRUMENT

1. STATUTORY POWERS GIVING RISE TO THIS DECISION INSTRUMENT

- 1.1 This Direction and Decision Instrument (hereinafter “**Decision Instrument**”) is made by the Commission for Communications Regulation (“**ComReg**”) and relates to the market for wholesale voice call termination on individual public telephone networks provided at a fixed location as identified by the European Commission in its 2014 Recommendation and relates to a further specification of the cost-orientation obligation imposed by ComReg under Section 12 of the Decision Instrument at Annex 16 of ComReg Decision D10/19.
- 1.2 This Decision Instrument is made:
- (i) Pursuant to, and having regard to, the functions and objectives of ComReg as set out in Sections 10 and 12 of the Communications Regulation Act 2002, as amended, and Regulation 6(1) of the Access Regulations, and Regulation 16 of the Framework Regulations; and
 - (ii) Having had regard to the market definition, market analysis and reasoning in ComReg Document 17/90 and in ComReg Decision D10/19; and
 - (iii) Pursuant to and having regard to the Significant Market Power (“**SMP**”) designations on each of the undertakings listed in Section 3.1 of this Decision Instrument in the Relevant Markets as provided for in Section 5.1 of the Decision Instrument at Annex 16 of ComReg Decision D10/19; and
 - (iv) Pursuant to and having regard to the cost-orientation obligation imposed on each of the Undertakings listed at Section 3.1 of this Decision Instrument as designated by Section 12.1 of the Decision Instrument at Annex 16 of ComReg Decision D10/19; and
 - (v) Having, where appropriate, pursuant to Section 13 of the Communications Regulation Act 2002, as amended, complied with Ministerial Policy Directions; and
 - (vi) Having taken the utmost account of the Termination Rates Recommendation; and

- (vii) Having had regard to the analysis and reasoning set out in ComReg Document 18/19; and
 - (viii) Having taken account of the submissions received from interested parties in relation to ComReg Document 18/19 following a public consultation pursuant to Regulation 12 of the Framework Regulations; and
 - (ix) Having had regard to the analysis and reasoning set out in the Analysys Mason Decision Pricing Report; and
 - (x) Having had regard to the analysis and reasoning set out in the TERA FTR Decision Specification Document; and
 - (xi) Having had regard to the analysis and reasoning set out in ComReg Document 14/136 and the Decision Instrument at Annex 2 of ComReg Decision D15/14; and
 - (xii) Having notified the draft measure and the reasoning on which same is based to the European Commission, BEREC and the national regulatory authorities in other EU Member States pursuant to Regulation 13 and 14 of the Framework Regulations and having taken the utmost account of any comments made by these parties; and
 - (xiii) Pursuant to Regulations 25, 26 and 27 of the Framework Regulations and Regulations 8, 13 and 18 of the Access Regulations.
- 1.3 The provisions of ComReg Document 17/90, ComReg Decision D10/19, ComReg Document 18/19 and ComReg Decision D11/19 shall, where appropriate, be construed with this Decision Instrument, however (save as provided in Section 1.4 of this Decision Instrument) if a conflict arises between the text of this Decision Instrument and ComReg Decision D10/19 and/or ComReg Decision D11/19, the text of this Decision Instrument shall prevail.
- 1.4 For the avoidance of doubt, to the extent that there is any conflict between a Decision Instrument dated prior to the Effective Date and obligations set out herein, it is the latter which shall prevail. However, the provisions of the Decision Instrument at Annex 16 of ComReg Decision D10/19 shall be construed with this Decision Instrument and in the event of a conflict between this Decision Instrument and the Decision Instrument at Annex 16 of ComReg Decision D10/19 the most restrictive provision or obligation shall apply.

PART I – GENERAL PROVISIONS (SECTIONS 2 AND 3 OF THE DECISION INSTRUMENT)

2. Definitions

2.1. In this Decision Instrument, unless the context otherwise suggests:

“**Access**” shall have the same meaning as under the Access Regulations; for the purposes of this Decision Instrument it shall include (but shall not be limited to) Access to FVCT and Associated Facilities where appropriate;

“**Access Regulations**” means the European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (S.I. No 334 of 2011), as may be amended from time to time or replaced with equivalent effect;

“**Airspeed Communications**” means Airspeed Communications Unlimited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“**Analysys Mason Decision Pricing Report**” means the document entitled “Pricing principles and methodologies for future regulation of wholesale voice call termination services”, dated March 2019 and published as ComReg Document 19/48a;

“**Associated Facilities**” shall have the same meaning as under the Framework Regulations, and for the purpose of this Decision Instrument shall include information on call routing, which assists and/or has the ability to assist in the provision of Access to FVCT;

“**BEREC**” means the Body of European Regulators for Electronic Communications, as established pursuant to Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009;

“**Blueface**” means Blue Face Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“**Bottom Up Pure Long Run Incremental Costs**” or “**BU Pure LRIC**” means the methodology used to estimate the Pure LRIC of an efficient operator which is derived from an economic/engineering model of an efficient network;

“**BU Pure LRIC Glide Path**” means the approach whereby maximum FTRs are subject to graduated annual decreases determined by reference to the maximum FTR(s) in place immediately prior to the Effective Date pursuant to Section 4.6 and 4.7 of ComReg Decision D12/12 and the maximum FTR(s) for 2022 as calculated by the BU Pure LRIC Model;

“**BU Pure LRIC Model**” means the model, as may be amended from time to time, used by ComReg to set FTRs in Ireland. The operation and details of the BU Pure LRIC

Model are more particularly described in the TERA FTR Decision Specification Document and published as ComReg 19/48c;

“BT Communications” means BT Communications Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Colt Technology Services” means Colt Technology Services Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Communications Regulation Act 2002 (as amended)” means the Communications Regulation Act 2002 (no. 20 of 2002) (as amended);

“ComReg” means the Commission for Communications Regulation, established under Section 6 of the Communications Regulation Act 2002, as amended;

“ComReg Decision D10/19” means ComReg Document 19/47 entitled “Market Review – Fixed Voice Call Termination and Mobile Voice Call Termination, Response to Consultation and Decision”, ComReg Document 19/47, Decision D10/19” dated 23 May 2019;

“ComReg Decision D11/19” means ComReg Document 19/48 entitled “Decision - Price Control Obligations for Fixed and Mobile Call Termination Rates, Response to Consultation and Decision”, ComReg Document 19/48, Decision D11/19” dated 23 May 2019;

“ComReg Decision D03/09” means the Decision Instrument in ComReg Document 09/65 entitled “Review of the regulatory asset lives of Eircom Limited – Response to Consultation and Decision” dated 11 August 2009;

“ComReg Decision D12/12” means ComReg Document 12/125 entitled “Mobile and Fixed Voice Call Termination Rates in Ireland, Response to Consultations, Decisions and Decision Instruments”, dated 21 November 2012;

“ComReg Decision D15/14” means the decision instruments contained in annexes 1 to 4 of ComReg Document 14/136;

“ComReg Document 17/90” means ComReg Document 17/90 entitled “Market Review – Fixed Voice Call Termination and Mobile Voice Call Termination, Consultation and Draft Decision”, dated 27 October 2017;

“ComReg Document 18/19” means ComReg Document 18/19 entitled “Price Consultation – Further Specification of Proposed Price Control Obligations for Fixed and Mobile Call Termination Rates”, dated 13 March 2018;

“ComReg Document 14/136” means ComReg Document 14/136 entitled “Cost of Capital: • Mobile Telecommunications, • Fixed Line telecommunications, • Broadcasting (Market A and Market B)”, dated 18 December 2014;

“Dialoga Servicios Interactivos” means Dialoga Servicios Interactivos, SA and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Effective Date” means the date set out in section 8 of this Decision Instrument;

“Eircom” means Eircom Limited and its subsidiaries, and any Undertaking which it owns or controls, and any Undertaking which owns or controls it and its successors, affiliates and assigns;

“End-User(s)” shall have the same meaning as under Regulation 2 of the Framework Regulations;

“Equant Network Systems” means Equant Network Systems Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Finarea” means Finarea SA and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Fixed Number” means a number from the Irish national numbering scheme as set out in the Numbering Conditions of Use, which, within the meaning of this Decision Instrument, is terminated at a fixed location and means a Geographic Number, a Nomadic Number, or an emergency access number (112 or 999);

“Fixed Service Provider(s)” or **“FSP(s)”** means an Undertaking providing End-Users with publicly available voice telephony services using a Fixed Number at a fixed location, irrespective of the underlying technology over which such services are delivered;

“Fixed Termination Rate(s)” or **“FTR(s)”** means the wholesale charge(s) levied by a Fixed Service Provider for the supply of Fixed Voice Call Termination;

“Fixed Voice Call Termination” or **“FVCT”** means the provision by a Fixed Service Provider of a wholesale call termination service to other Undertakings from the nearest point to the End-User or level on that terminating FSP’s network at which incoming voice calls can be handed over for termination to Fixed Numbers in respect of which that Fixed Service Provider is able to set the Fixed Termination Rate;

“Framework Directive” means 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, as amended *inter alia* by Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009;

“Framework Regulations” means the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No 333 of 2011), as may be amended from time to time or replaced with equivalent effect;

“Geographic Number” shall have the same meaning as set out in the Numbering Conditions of Use;

“Imagine Communications” means Imagine Communications Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Intellicom” means Intellicom Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Interconnection” shall have the same meaning as under Regulation 2 of the Access Regulations;

“In2com” means In2com Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“IP Telecom” means Internet Protocol Telecom Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Magnet Networks” means Magnet Networks Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Magrathea Telecommunications” means Magrathea Telecommunications (Ireland) Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Ministerial Policy Directions” for the purposes of this Decision Instrument means Policy Directions made by Dermot Ahern TD, then Minister for Communications, Marine and Natural Resources, dated 21 February 2003 and 26 March 2004;

“Modeva Networks” means Modeva Networks Unlimited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Nomadic Number(s)” has the same meaning as under the Numbering Conditions of Use;

“Non-Geographic Number” has the same meaning as under the Numbering Conditions of Use;

“Numbering Conditions of Use” means the set of rules under which the Irish national numbering scheme is managed and administered as set out in the document entitled *Numbering Conditions of Use and Application Process*, ComReg 15/136R1, as may be amended by ComReg from time to time or replaced with equivalent effect;

“PlanNet 21 Communications” means PlanNet 21 Communications Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking

which owns or controls it, and its successors, affiliates and assigns, which for the avoidance of doubt includes 3Play Plus Limited;

“Pure Long Run Incremental Costs” or **“Pure LRIC”** means those costs and only those costs which would be avoided in the long run if a SMP Fixed Service Provider were to cease to provide FVCT. For the avoidance of doubt, it excludes all costs which are joint or common to the provision of FVCT and to other services;

“Relevant Market” means, in the context of a particular SMP Fixed Service Provider, the specific market relating to that SMP Fixed Service Provider’s supply of FVCT as identified in Section 4.2(i) to 4.2(xxii) and 4.3 of the Decision Instrument at Annex 16 of ComReg Decision D10/19;

“Relevant Markets” means all of the markets defined in Section 4 of the Decision Instrument at Annex 16 of ComReg Decision D10/19;

“Significant Market Power (SMP) Fixed Service Provider” or **“SMP FSP”** means a Fixed Service Provider designated with SMP in Section 5.1 of the Decision Instrument at Annex 16 of ComReg Decision D10/19 as may be amended from time to time;

“Significant Market Power Obligations” or **“SMP Obligations”** are those obligations as more particularly described in Part II of the Decision Instrument at Annex 16 of ComReg Decision D10/19 as may be amended from time to time;

“TERA FTR Decision Specification Document” means the document entitled “Assessment of PURE LRIC FTRs in Ireland, Specifications and results”, dated February 2019 and published as ComReg Document 19/48c;

“(the) Termination Rates Recommendation” means the European Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC) (OJ L124/67).

“Telcom” means Telcom Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns, which for the avoidance of doubt includes Agility Communications Limited;

“Undertaking(s)” shall have the same meaning as under Regulation 2 of the Framework Regulations;

“Verizon” means Verizon Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Viatel” means Viatel Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns, which for the avoidance of doubt includes Digiweb Telecom Ireland Limited;

“**Virgin Media**” means Virgin Media Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“**Vodafone**” means Vodafone Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“**Voxbone**” means Voxbone SA and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns.

“**(the) 2014 Recommendation**” means the European Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (OJ L 295, 11.10.2014, p.79)

3. SCOPE AND APPLICATION

3.1. This Decision Instrument applies to each of the following Undertakings in respect of activities falling within the scope of the Relevant Markets defined in Section 4 of the Decision Instrument at Annex 16 of ComReg Decision D10/19. Furthermore, this Decision Instrument is binding upon each such Undertaking in the manner now set out below and each such Undertaking shall comply with this Decision Instrument to the extent that it applies to that Undertaking.

- (i) Airspeed Communications;
- (ii) Blueface;
- (iii) BT Communications;
- (iv) Colt Technology Services;
- (v) Dialoga Servicios Interactivos;
- (vi) Eircom;
- (vii) Equant Network Systems;
- (viii) Finarea;
- (ix) Imagine Communications;
- (x) Intellicom;
- (xi) In2com;

- (xii) IP Telecom;
- (xiii) Magnet Networks;
- (xiv) Magrathea Telecommunications;
- (xv) Modeva Networks;
- (xvi) PlanNet 21 Communications;
- (xvii) Telcom;
- (xviii) Verizon;
- (xix) Viatel;
- (xx) Virgin Media;
- (xxi) Vodafone;
- (xxii) Voxbone.

3.2. This Decision Instrument relates to the imposition, amendment and withdrawal, pursuant to Regulation 8 of the Access Regulations, of certain obligations contained in the Decision Instrument at Annex 1 of ComReg Decision D12/12 as it relates to Fixed Voice Call Termination. This Decision Instrument also relates to the further specification, pursuant to Regulation 18 of the Access Regulations, of certain obligations contained in Section 12 of the Decision Instrument at Annex 16 of ComReg Decision D10/19.

PART II – SMP OBLIGATIONS IN RELATION TO SMP FIXED SERVICE PROVIDERS (SECTION 4 OF THE DECISION INSTRUMENT)

4. OBLIGATIONS RELATING TO PRICE CONTROL

- 4.1. Pursuant to Regulation 13(1) of the Access Regulations and in accordance with Section 12 of the Decision Instrument at Annex 16 of ComReg Decision D10/19, each SMP Fixed Service Provider is subject to a cost-orientation obligation as regards FTRs and prices charged by the SMP Fixed Service Provider to any other Undertaking for Access to or use of those products, services or facilities referred to in Section 8 of the Decision Instrument at Annex 16 of ComReg Decision D10/19.
- 4.2. For the purpose of further specifying requirements to be complied with relating to the cost-orientation obligations set out in Section 12 of the Decision Instrument at Annex 16 of ComReg Decision D10/19, and pursuant to Regulation 18 of the Access Regulations, and in accordance with Regulation 13 of the Access

Regulations, with effect from 1 August 2019, each SMP Fixed Service Provider is hereby directed to ensure that its Fixed Termination Rate(s) are set in accordance with a BU Pure LRIC Glide Path.

- 4.3. Without prejudice to the generality of Section 4.2 of this Decision Instrument, pursuant to Regulation 18 of the Access Regulations and in accordance with Regulation 13 of the Access Regulations, with effect from 1 August 2019, insofar as a SMP Fixed Service Provider charges other Undertakings for FVCT on both a “cost per minute” and a “cost per call” basis, it shall ensure that its “cost per minute” and “cost per call” Fixed Termination Rates are no more than the relevant Fixed Termination Rates determined for that period in accordance with the BU Pure LRIC Glide Path which are set out in the table below.

Date	Two-Part Charge	
	Maximum “cost per minute” FTR (euro cent per minute)	Maximum “cost per call - set up fee” FTR (euro cent per call)
From 1 August 2019 – 31 December 2019	0.043	0.061
From 1 January 2020 – 31 December 2020	0.037	0.061
From 1 January 2021 – 31 December 2021	0.030	0.062
From 1 January 2022	0.024	0.062

- 4.4. Without prejudice to the generality of Section 4.2 of this Decision Instrument, pursuant to Regulation 18 of the Access Regulations and in accordance with Regulation 13 of the Access Regulations, with effect from 1 August 2019, insofar as a SMP Fixed Service Provider charges other Undertakings for FVCT only on a “cost per minute” basis, it shall ensure that its “cost per minute” Fixed Termination Rate is no more than the relevant Fixed Termination Rate determined for that period in accordance with the BU Pure LRIC Glide Path, which is set out in the table below.

Dates	Maximum “cost per minute” FTR (euro cent per minute)
From 1 August 2019 – 31 December 2019	0.063
From 1 January 2020 – 31 December 2020	0.057
From 1 January 2021 – 31 December 2021	0.051
From 1 January 2022	0.045

- 4.5. With effect from 1 August 2019, each SMP Fixed Service Provider shall apply Section 4.3 or Section 4.4 (as appropriate) to all invoices and credit notes issued by it to any Undertaking in respect of FVCT.
- 4.6. Without prejudice to Section 4.3 and Section 4.4, ComReg may review and if necessary, due to circumstances that ComReg considers exceptional, amend the maximum FTRs referred to in Section 4.3 and 4.4.

PART III – OBLIGATIONS AND EFFECTIVE DATE (SECTIONS 5 TO 8 OF THE DECISION INSTRUMENT)

5. STATUTORY POWERS NOT AFFECTED

- 5.1. Nothing in this Decision Instrument shall operate to limit ComReg in the exercise and performance of its statutory powers or duties conferred on it under any primary or secondary legislation (in force prior to or after the Effective Date of this Decision Instrument).

6. MAINTENANCE OF OBLIGATIONS

- 6.1. Unless expressly stated otherwise in this Decision Instrument, all obligations and requirements contained in decision instruments, decision notices and directions made by ComReg applying to the SMP Fixed Service Providers and in force immediately prior to the Effective Date of this Decision Instrument, are continued in force by this Decision Instrument and the SMP Fixed Service Providers shall comply with same.
- 6.2. If any section, clause or provision or portion thereof contained in this Decision Instrument is found to be invalid or prohibited by the Constitution, by any other

law or judged by a court to be unlawful, void or unenforceable, that section, clause or provision or portion thereof shall, to the extent required, be severed from this Decision Instrument and rendered ineffective as far as possible without modifying the remaining section(s), clause(s) or provision(s) or portion thereof of this Decision Instrument, and shall not in any way affect the validity or enforcement of this Decision Instrument.

7. AMENDMENT AND WITHDRAWAL OF EXISTING SMP OBLIGATIONS

- 7.1. For the avoidance of doubt, Annex 2 of ComReg Decision D15/14 applies to the Relevant Markets under consideration in this Decision Instrument.
- 7.2. For the avoidance of doubt, ComReg Decision D03/09 shall apply in respect of this Decision Instrument.
- 7.3. For the avoidance of doubt, the Decision Instrument at Annex 1 of ComReg Decision D12/12 shall be withdrawn in accordance with Section 14.1 of the Decision Instrument at Annex 16 of D10/19.

8. EFFECTIVE DATE

- 8.1. The Effective Date of this Decision Instrument shall be, unless otherwise stated in this Decision Instrument, the date of its notification to the SMP Fixed Service Providers and it shall remain in force until further notice by ComReg.
- 8.2. Notwithstanding Section 8.1, Sections 4.1 to 4.5 of this Decision Instrument shall apply to each SMP Fixed Service Provider with effect from 1 August 2019.

GARRETT BLANEY

CHAIRPERSON AND COMMISSIONER

THE COMMISSION FOR COMMUNICATIONS REGULATION

THE 23 DAY OF MAY 2019.

Annex: 2 Decision Instrument: Mobile Voice Call Termination

DECISION INSTRUMENT

1. STATUTORY POWERS GIVING RISE TO THIS DECISION INSTRUMENT

- 1.1 This Direction and Decision Instrument (hereinafter “**Decision Instrument**”) is made by the Commission for Communications Regulation (“**ComReg**”) and relates to the market for wholesale voice call termination on individual mobile networks as identified by the European Commission in its 2014 Recommendation and relates to a further specification of the cost-orientation obligation imposed by ComReg under Section 12 of the Decision Instrument at Annex 17 of ComReg Decision D10/19.
- 1.2 This Decision Instrument is made:
- (i) Pursuant to, and having regard to, the functions and objectives of ComReg as set out in Sections 10 and 12 of the Communications Regulation Act 2002, as amended, and Regulation 6(1) of the Access Regulations and Regulation 16 of the Framework Regulations; and
 - (ii) Having had regard to the market definition, market analysis and reasoning in ComReg Document 17/90 and in ComReg Decision D10/19; and
 - (iii) Pursuant to and having regard to the Significant Market Power (“**SMP**”) designations on each of the undertakings listed in Section 3.1 of this Decision Instrument in the Relevant Markets as provided for in Section 5.1 of the Decision Instrument at Annex 17 of ComReg Decision D10/19; and
 - (iv) Pursuant to and having regard to the cost-orientation obligation imposed on each of the Undertakings listed at Section 3.1 of this Decision Instrument as designated by Section 12.1 of the Decision Instrument at Annex 17 of ComReg Decision D10/19; and
 - (v) Having, where appropriate, pursuant to Section 13 of the Communications Regulation Act 2002, as amended, complied with Ministerial Policy Directions; and
 - (vi) Having taken the utmost account of the Termination Rates Recommendation; and

- (vii) Having had regard to the analysis and reasoning set out in ComReg Document 18/19; and
 - (viii) Having taken account of the submissions received from interested parties in relation to ComReg Document 18/19 following a public consultation pursuant to Regulation 12 of the Framework Regulations; and
 - (ix) Having had regard to the analysis and reasoning set out in the Analysys Mason Decision Pricing Report; and
 - (x) Having had regard to the analysis and reasoning set out in the Analysys Mason MTR Decision Specification Document; and
 - (xi) Having had regard to the analysis and reasoning set out in ComReg Document 14/136 and the Decision Instrument at Annex 1 of ComReg Decision D15/14; and
 - (xii) Having notified the draft measure and the reasoning on which same is based to the European Commission, BEREC and the national regulatory authorities in other EU Member States pursuant to Regulation 13 and 14 of the Framework Regulations and having taken the utmost account of any comments made by these parties; and
 - (xiii) Pursuant to Regulations 25, 26 and 27 of the Framework Regulations and Regulations 8, 13 and 18 of the Access Regulations.
- 1.3 The provisions of ComReg Document 17/90, ComReg Decision D10/19, ComReg Document 18/19 and ComReg Decision D11/19 shall, where appropriate, be construed with this Decision Instrument, however (save as provided in Section 1.4 of this Decision Instrument), if a conflict arises between the text of this Decision Instrument and ComReg Decision D10/19 and/or ComReg Decision D11/19, the text of this Decision Instrument shall prevail.
- 1.4 For the avoidance of doubt, to the extent that there is any conflict between a Decision Instrument dated prior to the Effective Date and obligations set out herein, it is the latter which shall prevail. However, the provisions of the Decision Instrument at Annex 17 of ComReg Decision D10/19 shall be construed with this Decision Instrument and in the event of a conflict between this Decision Instrument and the Decision Instrument at Annex 17 of ComReg Decision D10/19 the most restrictive provision or obligation shall apply.

PART I – GENERAL PROVISIONS (SECTIONS 2 AND 3 OF THE DECISION INSTRUMENT)

2. Definitions

2.1. In this Decision Instrument, unless the context otherwise suggests:

“**Access**” shall have the same meaning as under the Access Regulations; for the purposes of this Decision Instrument it shall include (but shall not be limited to) Access to MVCT and Associated Facilities where appropriate;

“**Access Regulations**” means the European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (S.I. No 334 of 2011), as may be amended from time to time or replaced with equivalent effect;

“**Analysys Mason MTR Decision Specification Document**” means the document entitled “*Specification for the new MTR model*”, dated March 2019 and published as ComReg Document 19/48b;

“**Analysys Mason Decision Pricing Report**” means the document entitled “Pricing principles and methodologies for future regulation of wholesale voice call termination services”, dated March 2019 and published as ComReg Document 19/48a;

“**Associated Facilities**” shall have the same meaning as under the Framework Regulations, and for the purpose of this Decision Instrument shall include information on call routing, which assists and/or has the ability to assist in the provision of Access to MVCT;

“**BEREC**” means the Body of European Regulators for Electronic Communications, as established pursuant to Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009;

“**Bottom Up Pure Long Run Incremental Costs**” or “**BU Pure LRIC**” means the methodology used to estimate the Pure LRIC of an efficient operator which is derived from an economic/engineering model of an efficient network;

“**BU Pure LRIC Model**” means the model, as may be amended from time to time, used by ComReg to set MTRs in Ireland. The operation and details of the BU Pure LRIC Model are more particularly described in the Analysys Mason MTR Decision Specification Document and published as ComReg Document 19/48b;

“**BU Pure LRIC Glide Path**” means the approach whereby maximum MTRs are subject to graduated annual decreases determined by reference to the maximum MTR in place on 31 December 2018 pursuant to Section 4.2 of ComReg Decision D02/16 and the maximum MTR for 2022 as calculated by the BU Pure LRIC Model;

“Communications Regulation Act 2002 (as amended)” means the Communications Regulation Act 2002 (no. 20 of 2002) (as amended);

“ComReg” means the Commission for Communications Regulation, established under Section 6 of the Communications Regulation Act 2002, as amended;

“ComReg Decision D10/19” means ComReg Document 19/47 entitled “Market Review – Fixed Voice Call Termination and Mobile Voice Call Termination, Response to Consultation and Decision”, ComReg Document 19/47, Decision D10/19” dated 23 May 2019;

“ComReg Decision D11/19” means ComReg Document 19/48 entitled “Decision – Price Control Obligations for Fixed and Mobile Call Termination Rates, Response to Consultation and Decision”, ComReg Document 19/48, Decision D11/19” dated 23 May 2019;

“ComReg Decision D02/16” means ComReg Document 16/09 entitled “Mobile Termination Rates Response to Consultation 14/29 and Supplementary Consultation 15/19 and Decision Document”, dated 12 February 2016;

“ComReg Decision D12/12” means ComReg Document 12/125 entitled “Mobile and Fixed Voice Call Termination Rates in Ireland, Response to Consultations, Decisions and Decision Instruments”, dated 21 November 2012;

“ComReg Decision D15/14” means the Decision Instruments contained in Annexes 1 to 4 of ComReg Document 14/136;

“ComReg Document 14/136” means ComReg Document 14/136 entitled “Cost of Capital: • Mobile Telecommunications, • Fixed Line telecommunications, • Broadcasting (Market A and Market B)” dated 18 December 2014;

“ComReg Document 17/90” means ComReg Document 17/90 entitled “Market Review - Fixed Voice Call Termination and Mobile Voice Call Termination, Consultation and Draft Decision”, dated 27 October 2017;

“ComReg Document 18/19” means ComReg Document 18/19 entitled “Price Consultation - Further Specification of Proposed Price Control Obligations for Fixed and Mobile Call Termination Rates”, dated 13 March 2018;

“Effective Date” means the date set out in section 8 of this Decision Instrument;

“End-User(s)” shall have the same meaning as under Regulation 2 of the Framework Regulations;

“Framework Directive” means 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, as amended *inter alia* by Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009;

“Framework Regulations” means the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No 333 of 2011), as may be amended from time to time or replaced with equivalent effect;

“Interconnection” shall have the same meaning as under Regulation 2 of the Access Regulations;

“Lycamobile” means Lycamobile Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Meteor” means Meteor Mobile Communications Limited, which is the mobile arm of the eir Group (which includes Eircom Limited and Eircom Holdings (Ireland) Limited), trading under the business name eir Mobile, and for the purpose of this Decision Instrument includes its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns¹;

“Ministerial Policy Directions” for the purposes of this Decision Instrument means Policy Directions made by Dermot Ahern TD, then Minister for Communications, Marine and Natural Resources, dated 21 February 2003 and 26 March 2004;

“Mobile Network” means a 2nd, 3rd, 4th, or 5th Generation digital wireless network, or any intermediate evolution of those, using Mobile Numbers, in which seamless handover and roaming features are provided;

“Mobile Number(s)” shall have the same meaning as set out in the Numbering Conditions of Use;

“Mobile Service Provider(s)” or **“MSP(s)”** means an Undertaking providing End-Users with land based/terrestrial publicly available mobile voice telephony services using a Mobile Network;

“Mobile Termination Rate(s)” or **“MTR(s)”** means the wholesale charge(s) levied by a Mobile Service Provider for the supply of Mobile Voice Call Termination;

“Mobile Voice Call Termination” or **“MVCT”** means the provision by a Mobile Service Provider of a wholesale call termination service to other Undertakings for the purpose of terminating incoming voice calls to a Mobile Number in respect of which that Mobile Service Provider is able to set the Mobile Termination Rate. For the avoidance of doubt, the provision of Mobile Voice Call Termination involves the provision of Interconnection;

¹ Meteor announced in July 2017 that its branding would be retired and replaced with Eircom branding from September 2017. At present Meteor is the licensed Mobile Service Provider and so for the purposes of this Decision Instrument, ComReg has continued to refer to Meteor, however this position should be understood to apply to Eircom Limited, or some other Undertaking, should it become a successor or assign of Meteor or in any other way the appropriate Undertaking to be designated with SMP.

“Numbering Conditions of Use” means the set of rules under which the Irish national numbering scheme is managed and administered as set out in the document entitled *Numbering Conditions of Use and Application Process*, ComReg 15/136R1, as may be amended by ComReg from time to time or replaced with equivalent effect;

“Pure Long Run Incremental Costs” or **“Pure LRIC”** means those costs and only those costs which would be avoided in the long run if a SMP Mobile Service Provider were to cease to provide MVCT. For the avoidance of doubt, it excludes all costs which are joint or common to the provision of MVCT and to other services;

“Relevant Market” means, in the context of a particular SMP Mobile Service Provider, the specific market relating to that SMP Mobile Service Provider’s supply of MVCT as identified in Sections 4.2(i) to 4.2(v) and 4.3 of the Decision Instrument at Annex 17 of ComReg Decision D10/19;

“Relevant Markets” means all of the markets defined in Section 4 of the Decision Instrument at Annex 17 of ComReg Decision D10/19;

“Significant Market Power (SMP) Mobile Service Provider” or **“SMP MSP”** refers to a Mobile Service Provider designated with SMP in Section 5 of the Decision Instrument at Annex 17 of ComReg Decision D10/19 as may be amended from time to time;

“Significant Market Power Obligations” or **“SMP Obligations”** are those obligations as more particularly described in Part II of the Decision Instrument at Annex 17 of ComReg Decision D10/19 as may be amended from time to time;

“(the) Termination Rates Recommendation” means the European Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC) (OJ L124/67).

“Tesco Mobile” means Tesco Mobile Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Three” means Three Ireland (Hutchison) Limited and its subsidiaries, and any Undertaking which it owns or controls and any undertaking which owns or controls it, and its successors, affiliates and assigns, which for the avoidance of doubt includes Three Ireland Services (Hutchison) Limited;

“Undertaking(s)” shall have the same meaning as under Regulation 2 of the Framework Regulations;

“Virgin Media” means Virgin Media Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns;

“Vodafone” means Vodafone Ireland Limited and its subsidiaries, and any Undertaking which it owns or controls and any Undertaking which owns or controls it, and its successors, affiliates and assigns.

“(the) 2014 Recommendation” means the European Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (OJ L 295, 11.10.2014, p.79)

3. SCOPE AND APPLICATION

3.1. This Decision Instrument applies to each of the following Undertakings in respect of activities falling within the scope of the Relevant Markets defined in Section 4 of the Decision Instrument at Annex 17 of ComReg Decision D10/19. Furthermore, this Decision Instrument is binding upon each such Undertaking in the manner now set out below and each such Undertaking shall comply with this Decision Instrument to the extent that it applies to that Undertaking.

- (i) Lycamobile;
- (ii) Meteor;
- (iii) Tesco Mobile;
- (iv) Three;
- (v) Virgin Media; and
- (vi) Vodafone.

3.2. This Decision Instrument relates to the imposition, amendment and withdrawal, pursuant to Regulation 8 of the Access Regulations, of certain obligations contained in the Decision Instrument at Annex 1 of ComReg Decision D02/16 as it relates to Mobile Voice Call Termination. This Decision Instrument also relates to the further specification, pursuant to Regulation 18 of the Access Regulations, of certain obligations contained in Section 12 of the Decision Instrument at Annex 17 of ComReg Decision D10/19.

PART II – SMP OBLIGATIONS IN RELATION TO SMP MOBILE SERVICE PROVIDERS (SECTION 4 OF THE DECISION INSTRUMENT)

4. OBLIGATIONS RELATING TO PRICE CONTROL

4.1. Pursuant to Regulation 13(1) of the Access Regulations and in accordance with Section 12 of the Decision Instrument at Annex 17 of ComReg Decision D10/19, each SMP Mobile Service Provider is subject to a cost-orientation obligation as regards MTRs and prices charged by the SMP Mobile Service Provider to any other Undertaking for Access to or use of those products, services or facilities referred to in Section 8 of the Decision Instrument at Annex 17 of ComReg Decision D10/19.

- 4.2 For the purpose of further specifying requirements to be complied with relating to the cost-orientation obligations set out in Section 12 of the Decision Instrument contained in Annex 17 of ComReg Decision D10/19, and pursuant to Regulation 18 of the Access Regulations, and in accordance with Regulation 13 of the Access Regulations, with effect from 1 August 2019, each SMP Mobile Service Provider is hereby directed to ensure that its Mobile Termination Rate(s) are set in accordance with a BU Pure LRIC Glide Path.
- 4.3 Without prejudice to the generality of Section 4.2 of this Decision Instrument, pursuant to Regulation 18 of the Access Regulations and in accordance with Regulation 13 of the Access Regulations, with effect from 1 August 2019, insofar as a SMP Mobile Service Provider charges other Undertakings for MVCT, it shall ensure that its Mobile Termination Rate(s) is no more than the relevant Mobile Termination Rate determined for that period in accordance with the BU Pure LRIC Glide Path, which are set out in the table below.

Dates	Regulated maximum MTRs (euro cent per minute)
From 1 August 2019 - 31 December 2019	0.67
From 1 January 2020 - 31 December 2020	0.55
From 1 January 2021 - 31 December 2021	0.43
From 1 January 2022	0.31

- 4.4 With effect from 1 August 2019 each SMP Mobile Service Provider shall apply Section 4.3 to all invoices and credit notes issued by it to any Undertaking in respect of MVCT.
- 4.5 Without prejudice to Section 4.3, ComReg may review and if necessary, due to circumstances that ComReg considers exceptional, amend the maximum MTRs referred to in Section 4.3.

PART III – OBLIGATIONS AND EFFECTIVE DATE (SECTIONS 5 TO 8 OF THE DECISION INSTRUMENT)

5 **STATUTORY POWERS NOT AFFECTED**

- 5.2 Nothing in this Decision Instrument shall operate to limit ComReg in the exercise and performance of its statutory powers or duties conferred on it under any primary or secondary legislation (in force prior to or after the Effective Date of this Decision Instrument).

6 **MAINTENANCE OF OBLIGATIONS**

- 6.2 Unless expressly stated otherwise in this Decision Instrument, all obligations and requirements contained in decision instruments, decision notices and directions made by ComReg applying to the SMP Mobile Service Providers and in force immediately prior to the Effective Date of this Decision Instrument, are continued in force by this Decision Instrument and the SMP Mobile Service Providers shall comply with same.
- 6.3 If any section, clause or provision or portion thereof contained in this Decision Instrument is found to be invalid or prohibited: by the Constitution, by any other law or judged by a court to be unlawful, void or unenforceable, that section, clause or provision or portion thereof shall, to the extent required, be severed from this Decision Instrument and rendered ineffective as far as possible without modifying the remaining section(s), clause(s) or provision(s) or portion thereof of this Decision Instrument, and shall not in any way affect the validity or enforcement of this Decision Instrument.

7 **AMENDMENT AND WITHDRAWAL OF EXISTING SMP OBLIGATIONS**

- 7.2 Pursuant to Regulation 8, 13 and 18 of the Access Regulations, the definition of relevant markets contained in Annex 1 of ComReg Decision D15/14 is hereby extended to include the Relevant Markets outlined in Sections 4.2(i) to (vii) and 4.3 of the Decision Instrument at Annex 17 of ComReg Decision D10/19. For the avoidance of doubt, Annex 1 of ComReg Decision D15/14 applies to the Relevant Markets under consideration in this Decision Instrument.
- 7.3 For the avoidance of doubt, the Decision Instrument at Annex 2 of ComReg Decision D12/12, the remainder of ComReg Decision D12/12, and ComReg Decision D02/16 shall be withdrawn in accordance with Section 14.1 of the Decision Instrument at Annex 17 of D10/19.

8 **EFFECTIVE DATE**

- 8.2 The Effective Date of this Decision Instrument shall be, unless otherwise stated in this Decision Instrument, the date of its notification to the SMP Mobile Service Providers and it shall remain in force until further notice by ComReg.
- 8.3 Notwithstanding Section 8.1, Section 4.1 to Section 4.5 of this Decision Instrument shall apply to each SMP Mobile Service Provider with effect from 1 August 2019.

GARRETT BLANEY

CHAIRPERSON AND COMMISSIONER

THE COMMISSION FOR COMMUNICATIONS REGULATION

THE 23 DAY OF MAY 2019.

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Annex: 3 Glossary

Acronym	Full Title
2G	Second generation of mobile telephony
3G	Third generation of mobile telephony
4G	Fourth generation of mobile telephony
APT	Access Packet Transport
B&K	Bill and Keep
BEREC	Body of European Regulators for Electronic Communications
BHE	Busy-hour Erlangs
BSC	Base station controller
BTS	Base Transceiver station <i>or</i> base station
BU LRIC	Bottom-up Long-Run Incremental Cost
BU Model	Bottom Up Model
CAGR	Compound Annual Growth Rate
CCA	Current Cost Accounting
CDR	Call detail record
CPI	Consumer price index
CSO	Central Statistics Office
CWDM	Code or coarse wavelength division multiplexing
DC-HSPA	Dual Carrier High Speed Packet Access
DSLAM	Digital Subscriber Line Access Multiplexers
E1	2Mbit/s unit of capacity
EC	European Commission
ED	Economic depreciation
EPC	Enhanced packet core
EPMU	Equi-proportionate mark-up
EU	European Union
DWDM	Dense wavelength division multiplexing
F&R	Fair and Reasonable
FA	Fixed Access
FCM	Financial Capital Maintenance
FL-LRIC	Forward Looking LRIC
FSP	Fixed Service Provider
FTR	Fixed Termination Rate
FTTH	Fibre To The Home
FVCT	Fixed Voice Call Termination
GGSN	Gateway GPRS Serving Node
GHz	Gigahertz
GPRS	General packet radio system
GSM	Global system for mobile communications
GSM MSC	Global system for mobile communications Mobile switching Centre

GSN	Gateway serving node
HCA	Historic Cost Accounting
HSDPA	High-speed downlink packet access
HSPA	High-speed packet access
HSUPA	High speed uplink packet access
HLR	Home Location Register
IP	Internet Protocol
I-SBC	Interconnect session border controller
IMS	IP multimedia subsystem
IMS CORE	Internet Protocol Multimedia Sub System Core
LMA	Last Mile Access
LRAIC+	Long-run average incremental cost plus
LRIC	Long Run Incremental Cost
LTE	Long-term evolution
MC	Marginal costc
MEA	Modern Equivalent Asset
MGC	Media Gateway Controller
MGW	Media gateway
MME	Mobility Management Entity
MMS	Multimedia Messaging Service
MMSC	MMS Centre
MNO	Mobile Network Operator
MSP	Mobile Service Provider
MSS	MSC server
MTR	Mobile Termination Rate
MVCT	Mobile Voice Call Termination
MVNO	Mobile Virtual Network Operator
NGA	Next Generation Access
NGN	Next-generation network
NodeB	Denotes the UMTS equivalent of a BTS
NPV	Net present value
NRA	National Regulatory Authority
OCM	Operating Capital Maintenance
OLT	Optical Line Terminal
PDP	Packet data protocol
PoI	Point of interconnect
PSTN	Public Switched Telephone Network
PV	Present value
ROADM	Reconfigurable optical add-drop multiplexer
RIA	Regulatory Impact Assessment
RNC	Radio network controller
RPP	Receiving Party Pays
S-RAN	Single radio access network
SAU	Simultaneously attached users

SBC	Session border controller
SGSN	Subscriber GPRS serving node
SGW	Serving gateway
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
SMP	Significant Market Power
SMS	Short Message Service
SMSC	SMS centre
STM	Synchronous transport module
TAS	Telephony application server
TDM	Time Division Multiplexing
TD – Model	Top down Model
TMNE	Tariff-Mediated Network Externality
UMTS	Universal mobile telecommunications systems
VMS	Voicemail system
VoWIFI	Voice over WIFI
VoIP	Voice over Internet Protocol
VoLTE	Voice over LTE
WACC	Weighted Average Cost of Capital
WDM	Wavelength Division Multiplexing

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Annex: 4 Review Of Consultation Submissions

- A 4.1 In the Consultation ComReg invited all interested parties to respond to the questions raised. ComReg said it would analyse and consider the comments received and in light of such would then review the proposals set out in the Consultation and amend them as necessary.
- A 4.2 This Annex now provides a summary and assessment of the four Submissions received in response to the Consultation. The Respondents to the Consultation were Eircom Limited (“Eircom”), Tesco Mobile Ireland Limited (“Tesco Mobile”), Verizon Ireland Limited (“Verizon”) and Vodafone Ireland Limited (“Vodafone”).
- A 4.3 A total of 18 questions were posed throughout the Consultation on which input was sought from interested parties on ComReg’s preliminary views in relation to the key topics discussed in the Consultation.
- A 4.4 The main sections in the Consultation and the associated questions on which feedback was sought were as follows:

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Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 4.21	Hypothetical operator / Bottom Up or Top Down Models	Q.1 Do you agree or disagree that the cost orientated models for setting maximum FTRs and MTRs should be bottom-up models of hypothetical efficient operators? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.	Annex 4 - Paragraph A 4.6 to A 4.20.
Section 4.22	Choice of Increment	Q. 2 Do you agree that cost orientation by means of a pure LRIC methodology is the most appropriate approach to set Termination Rates in Ireland? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position	Annex 4 – Paragraph A 4.26 to A 4.103

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 4.3	Economic Cost Recovery	Q. 3 Do you agree with the preliminary opinion of ComReg regarding the choice of depreciation methods used in the calculation of the MTRs and FTRs? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position	Annex 4 – Paragraph A 4.104 to A 4.113.
Section 4.4	Network Nodes	Q. 4 Do you agree with ComReg's preliminary view that a modified scorched node approach is appropriate for the modelling of mobile networks? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position	Annex 4 – Paragraph A 4.115 to A 4.119.

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 4.4	Network Nodes	Q. 5 Do you agree with ComReg's preliminary view that a scorched node approach is appropriate for the modelling of fixed networks? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.	Annex 4 – Paragraph A 4.121 to A 4.125.
Section 4.5	Symmetry of Termination Rates	Q. 6 Do you agree that regulated maximum Termination Rates should be symmetric? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position	Annex 4 – Paragraph A 4.127 to A 4.136.

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 4.6	Consistency in Approaches for FVCT and MVCT	Q. 7 Do you agree or disagree that there is a need for consistency in the setting of regulated Termination Rates between the FVCT and MVCT markets? Is there in your opinion any other aspects where there is a need for consistency between those markets? Please provide reasons for your response	Annex 4 – Paragraph A 4.138 to A 4.147.
Section 5.3	FTR Modelling	Q. 8 Do you agree or disagree with the proposed inputs and assumptions in the proposed BU pure LRIC FTR model for the purposes of determining the fixed termination rate? Please provide reasons for your response	Annex 4 – Paragraph A 4.149 to A 4.158.
Section 5.3	FTR Modelling	Q. 9 Do you believe that there is any other data that is relevant to the proposed BU pure LRIC FTR model? If so, this data should be provided to ComReg for consideration in any decision	Annex 4 - Paragraph A 4.159 to A 4.163.

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 5.36	Preliminary FTR Calculation Results	<p>Q. 10 Do you agree or disagree with ComReg's preliminary views regarding the maximum FTRs that FSPs should charge as set out in this 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.</p>	Annex 4 – Paragraph A 4.164 to A 4.172.
Section 5.36	Preliminary FTR Calculation Results	<p>Q. 11 Do you agree or disagree with the use of a mid-point of the proposed maximum rates as the maximum rate for the entire regulatory control period? 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</p>	Annex 4 – Paragraph A 4.173 to A 4.181.

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 5.36	Preliminary FTR Calculation Results	<p>Q. 12 Do you agree or disagree with ComReg's preliminary views regarding the implementation of any decision on maximum FTRs that can be charged by FSPs found to have SMP in their respective call termination markets? 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</p>	Annex 4 – Paragraph A 4.182 to A 4.188.
Section 5.4	MTR Modelling	<p>Q. 13 Do you agree or disagree with the proposed inputs and assumptions used in the development of the proposed BU pure LRIC MTR model for the purposes of determining the mobile termination rate as set out above and detailed in the MTR Specification Document? Please provide reasons for your response with references to specific paragraphs in this Consultation</p>	Annex 4 – Paragraph A 4.189 to A 4.207.

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 5.4	MTR Modelling	Q. 14 Do you believe that there is any other data that is relevant to the proposed MTR model? If so, this data should be provided to ComReg for consideration in the final decision	Annex 4 – Paragraph A 4.210 to A 4.222.
Section 5.46	Main Changes in the Proposed MTR Model	Q. 15 Do you agree with ComReg's preliminary views regarding the maximum regulated MTR that MSPs with SMP should charge for the forthcoming price control period? 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	Annex 4 – Paragraph A 4.223 to A 4.234
Section 5.46	Main Changes in the Proposed MTR Model	Q. 16 Is there any other issue raised in this Consultation for which you would like to provide a response? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence to support your opinion/position.	Annex 4 – Paragraph A 4.235 to A 4.243

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 5.46	Main Changes in the Proposed MTR Model	<p>Q. 17 Having considered this Consultation are there any further comments you would like to make on the proposed decision to impose a price control of cost orientation in the associated Market Review Consultation? If so can you please refer in your comments to the relevant paragraphs in that decision and support any comments with economics based argumentation and facts. Please note that the text of the draft decision instruments at Annexes 1 and 2 of this document may be subject to change to reflect any final decision taken in regard to the decision instruments proposed in the Market Review Consultation.</p>	Annex 4 – Paragraph A 4.244 to A 4.247.

Section of Consultation	Topic Discussed	Consultation Question	ComReg Response & Assessment of Responses Received
Section 6	Regulatory Impact Assessment ("RIA")	Q. 18 Do you have any views on the Regulatory Impact Assessment? Are there other factors that ComReg should consider in completing its Regulatory Impact Assessment? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all facts or argumentation supporting your position	Annex 4 – Paragraph A 4.251 to A 4.263.

A 4.5 ComReg now considers each of the above topics on a question by question basis. The approach is as follows:

- ComReg's preliminary view is summarised;
- The relevant question is then set out;
- Those Respondents who replied directly to the question are listed;
- The overall response of each Respondent to the question is referenced;
- The main issues raised by Respondents regarding the question are identified;
- For each issue, ComReg then summarises the points made by Respondents and assesses the issue and points made; and
- ComReg then concludes with its response to the issue.

Question 1 Responses - Bottom Up or Top Down Model (Section 4.2.1 of Consultation)

A 4.6 ComReg considered the use of BU and TD Models to determine the costs of call termination. Based on this ComReg came to the preliminary view that costs of call termination should be determined based on a BU Model of a hypothetical efficient operator.

A 4.7 ComReg asked the following question, Question 1, in the Consultation:

Do you agree or disagree that the cost orientated models for setting maximum FTRs and MTRs should be bottom-up models of hypothetical efficient operators? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.

A 4.8 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.9 Both replies were in general agreement with the use of BU models of hypothetically efficient operators for setting maximum call termination rates. Eircom was of the opinion that the use of a BU methodology is preferable to a TD approach and that the use of a hypothetical efficient operator was appropriate as long as it was based on a reasonable hypothesis. Vodafone had no issue with the theory of BU models which attempt to estimate the costs of a hypothetical efficient operator.

Issues raised regarding the use of BU Models

A 4.10 Issues were raised regarding the following:

- Accuracy of the model; and
- Whether rates are too low.

Issue raised - Accuracy of the Model

A 4.11 Vodafone (in paragraph 1 of its Submission) said that certainty as to the accuracy of a BU model is difficult to obtain. Vodafone also said that models should be calibrated against the expenditure of actual operators to ensure a reasonable result is achieved.

ComReg's Issue Assessment – Accuracy of the Model

A 4.12 ComReg and its consultants, TERA and AM, have experience and expertise in building cost models for call termination services.

A 4.13 Both sets of consultants carried out extensive calibration exercises and sensitivity checks on the inputs in the models. The TD validation of the proposed MTR model was described in Annex C of the MTR Consultation Specification Document, where AM validated the asset counts and expenditures based on the TD information provided by MNOs to the SIR. A TD validation was also performed (during the development of the NGN model) as set out in Section 1.4.2 of TERA's FTR Consultation Specification Document whereby the number of assets modelled was compared with the real number of assets in the network. In particular a comparison was made between data supplied by Eircom and the output from the NGN Core Model for the following elements: numbers of exchanges, aggregation nodes, edge nodes and core nodes, and DSLAMs/Chassis.

A 4.14 ComReg worked with its consultants to ensure the accuracy of the models and to understand the reasons for the change in Termination Rates since the previous consultations.

ComReg's Response to Issue – Accuracy of the Model

A 4.15 ComReg considers that the models produced are accurate based on the inputs provided by operators and the forecasts of future demand.

Issue raised – Whether rates are too low

A 4.16 Vodafone (in paragraph 1 of its Submission) urged ComReg to consider carefully whether the Termination Rates proposed are too low.

ComReg's Issue Assessment – Whether rates are too low

- A 4.17 AM (in Section A.3 of its AM Decision Pricing Report) while noting that the rates calculated by the MTR Decision Model lie at the low end of BEREC's benchmark as of July 2018, explains that the new MTR model contains several major updates to the modelling approach which will have a downward impact on the modelled costs of voice (e.g. 4G, Ethernet transmission, single RAN). It goes on to state that several inputs have been updated compared with the previous MTR model, including a higher data forecast, reduced cell radii and recalibrated unit costs based on more recent operator data.
- A 4.18 In comparing the results of the MTR Decision Model with other countries, AM (in Section A.3 of its AM Decision Pricing Report) produced Figure 2.1 which set out a benchmark of potential future MTRs for other countries for the 2019-2021 period and identified that the results calculated by the MTR Decision Model are not unduly low given the following:
- The MTR proposed for Portugal for 2021 of €0.0031 will be almost the same as modelled for Ireland that year;
 - The MTR rate for Norway for 2020 of €0.0034 will be comparable with that modelled for Ireland and would fall lower again in 2021;
 - The Models in other countries e.g. Denmark, Malta and Norway do not model 4G or S-Ran technologies and if included would reduce the cost of termination further;
 - The Model in Netherlands has excluded adjustments for assets where a contribution of their long-run average incremental cost is included. If these were excluded, which would be consistent with the modelling approach undertaken in ComReg's model, then the resulting per-minute costs would be comparable with those in ComReg's MTR model in 2020 and 2021; and
 - The Model in France is consistently producing much lower costs of termination compared to Ireland.
- A 4.19 Section 5.4.6 in this Decision details the main changes to the MTR Decision Model compared with the 2016 MTR model – paragraph 5.165 lists some of the key differences between the models that led to different pure LRIC MTRs. Paragraph 5.30 of this Decision goes through the key reasons for the reductions in MTRs since the 2016 MTR model.

ComReg's Response to Issue – Whether rates are too low

A 4.20 In light of the above discussion and given the fact that ComReg's model is the most recent one developed in the EU, it can be expected that it will reflect the latest developments on mobile data growth, single-RAN costs, etc. ComReg does not therefore consider that the modelled MTR rates are too low.

Other Issues/Comments Raised – Not directly related to the question

A 4.21 Tesco Mobile (on page 2, paragraph 2 of its submission) stated that the unique position and value of MVNOs have not been taken into account and the proposed MTR model is based on a hypothetical efficient operator that reflects a market in which only established mobile network operators (MNOs) operate and compete.

A 4.22 Verizon (on page 5, paragraph 1 of its submission) agrees with the continued adoption of a BU-LRIC based approach arguing that consistency of regulatory approach across the EU is of considerable benefit to both pan-European and even global Service Providers and consumers alike.

ComReg's Issue Assessment – Recognition of position and value of MVNOs

A 4.23 In responding to Tesco Mobile's concerns, AM (in section A.9 of its AM Decision Pricing Report) clarifies that MVCT is carried by the host network of the subscriber and the MTR cost model aims to capture all the relevant network costs of a hypothetical efficient network operator which carries network traffic. While some of this network traffic comes from its own retail services, and some from hosted MVNOs, all relevant network costs are however intended to be covered by the cost model. As set out in Figure 3.12 of the MTR Consultation Specification Document hosted MVCT traffic is included within the service definition.

A 4.24 AM further clarified that it has not received any evidence from any MVNO demonstrating that its cost of MVCT is materially different from the LRAIC+ and pure LRIC that has been calculated by the model. It goes on to note that BEREC and the European Commission have concluded in other Member States (e.g. France and Italy) that full MVNOs can benefit from the same economies of scale/scope as their host and so can achieve the same unit costs of termination.

ComReg's Response to Issue – Recognition of position and value of MVNOs

A 4.25 In light of the above discussion, ComReg is of the opinion that the unique position and value of MVNOs has been recognised in the development of the MTR cost model, therefore reflecting the entire market.

Question 2 Responses - Choice of Increment (Section 4.2.2 of the Consultation)

A 4.26 ComReg recognised in the Consultation the need to identify the additional or incremental costs to operators of providing wholesale termination services. ComReg put forward the following costing methodologies as candidates for determining the relevant increment:

- LRAIC
- LRAIC+
- (Pure) LRIC
- LRIC+
- Marginal Cost.

A 4.27 In determining the most appropriate approach, ComReg (in consultation with AM) proposed the following factors for consideration⁵³:

- Two-sided market structure
- Associated externalities
- Relationship to market competitiveness and efficiency
- Impact on relevant markets
- Regulatory best practice

A 4.28 Having considered the above, ComReg came to the preliminary opinion that cost orientated tariffs should be calculated by means of a BU pure LRIC approach.

A 4.29 ComReg then asked the following question, Question 2, in the Consultation:

Do you agree that cost orientation by means of a pure LRIC methodology is the most appropriate approach to set Termination Rates in Ireland? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.

List of Respondents

A 4.30 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.31 While only two direct replies were received to this question, another Respondent, Verizon, also discussed the choice of the LRIC standard in its Submission. Two of the Respondents (Eircom and Verizon) agreed with the choice of LRIC, stating that it was the most appropriate approach for fixed and mobile Termination Rates. Vodafone on the other hand did not agree with the choice of LRIC, favouring the use of LRAIC+ instead.

A 4.32 Two key issues were raised by Respondents to the question:

- Appropriateness of pure LRIC methodology; and
- Recovery of common costs.

Issue raised – Appropriateness of pure LRIC

A 4.33 Eircom (in paragraph 9 of its Submission) agreed that cost orientation by means of a pure LRIC methodology is the most appropriate approach to setting voice Termination Rates. Eircom further clarified that the operator terminating a call is entitled to recover at least the efficient level of incremental cost from charges for call termination.

A 4.34 Verizon (in paragraph 4 of its Submission) also agreed with the LRIC standard, stating that it is the most appropriate standard to choose in order to best sustain competition in Ireland, for both fixed and mobile Termination Rates.

A 4.35 Vodafone on the other hand (in paragraph 2 of its Submission) disagreed that pure LRIC is the most appropriate methodology for setting Termination Rates in Ireland and argued (in paragraph X of its Introduction) that material presented by ComReg based on efficiency, competition and equity consideration, in conjunction with the proposed rates, does not support this conclusion. It goes on to conclude (in paragraph XVII of its Introduction) that LRAIC+ would be a more appropriate and less intrusive cost standard in the Irish market.

A 4.36 In considering the factors discussed by ComReg in the Consultation, Vodafone made a number of comments (as set out in paragraphs 2 to 15 of its Submission) discussed below (in paragraphs A 4.37 to A 4.47). For ease of analysis, the comments raised by Vodafone and ComReg's assessment of such has being categorised according to the factors considered in the Consultation (and as set out in paragraph A 4.27 above).

Two-sided market structure

A 4.37 Vodafone (in paragraph 3 of its Submission) states that, given the current nature of the termination markets and the fact that termination revenue represents a low percentage of total service revenue, the objective of not causing market distortion is already being achieved. Vodafone goes on to state that ComReg has failed to demonstrate in this context why LRAIC or LRAIC+ are less appropriate than LRIC.

A 4.38 Vodafone (in paragraph 15 of its Submission) references the statement made by ComReg (in paragraph 4.32 of the Consultation document) in which ComReg states that the closer prices are set to an incremental cost (over the long term), the more likely the regulatory objectives of avoiding competitive distortions and encouraging efficient investment will be met. Vodafone believes that ComReg has, however, neglected to take the latter part of this statement into consideration when deciding on the proposed rates and considering the potential impact on all parties. Vodafone then goes on to state that, while the net effect of the decrease in MTRs may be small at the lower proposed rates, it still has an impact on Vodafone.

Associated Externalities

A 4.39 Vodafone (in paragraph 5 of its Submission) refers to ComReg's statement (in paragraph 4.40 of the Consultation) where ComReg states that "...LRIC of termination has been established as being at a level that is no longer particularly material to operators". Referring to the comment made by ComReg that for a mark-up to have any material effect it would have to be so large as to exacerbate competitive distortions, Vodafone argues that these competitive distortions do not exist and states that this further emphasises the fact that rates are currently very low. Vodafone also argues (in paragraphs VII and XVII of its Introduction) that the rates proposed are so much lower and considerably out of line with the figures calculated in other EU countries and this has not been explained or justified.

- A 4.40 Vodafone (in paragraph 6 of its Submission) discusses the comment made by ComReg (in paragraph 4.45 of the Consultation) that setting Termination Rates above incremental cost could result in the calling party initiating an inefficiently low number of calls from the receiving party's perspective. Vodafone argues that there is no evidence that this is the case for existing rates nor has ComReg demonstrated empirically the effect that marginal increases above existing rates have on existing retail rates.
- A 4.41 In conclusion, Vodafone (in paragraphs 6 and 7 of its Submission) is of the opinion that ComReg has not demonstrated why call externalities should not result in a mark-up of termination prices and why a LRAIC+ methodology should not apply nor that the application of pure LRIC will prevent distortive effects of TMNEs.

Relationship to market competitiveness and efficiency

- A 4.42 Vodafone (in paragraph 8 of its Submission) referred to comments (made in paragraph 4.53 of the Consultation) that increasing prices above marginal cost results in decline in call volumes and welfare and contended that, given the already low nature of termination prices, this would not happen and ComReg had not demonstrated the extent to which this is true.
- A 4.43 Vodafone referred to ComReg's statement (in paragraph 4.56 of the Consultation) that there is no evidence that pure LRIC based MTRs would have an adverse impact on competition for voice calling. Vodafone submitted (in paragraph 9 of its Submission) that ComReg had not demonstrated this nor had it demonstrated that the use of LRAIC+ would have an adverse effect on such.

Impact on relevant markets

- A 4.44 Vodafone (in paragraph 10 of its Submission) questioned the positive impact that lowering MTR further would have on the retail market and highlighted (in paragraph XVI of its Introduction) that a simple review of Eircom's per minute charges to mobile networks shows an increase in the per minute charge post the reductions in MVCT in recent years. In referring to the comment made by ComReg (paragraph 4.60 of the Consultation) that MSPs are not passing lower FTRs on to the consumer in the form of lower retail tariffs to call fixed networks, Vodafone suggested the same would apply to lowering MTRs. Vodafone (in paragraph XVI of its Introduction) go on to claim that ComReg has not demonstrated any link between increased volume in consumer bundles offered to customers and reducing MTR rates.

- A 4.45 Vodafone (in paragraph 11 of its Submission) referenced the comment made by ComReg (in paragraph 4.61 of the Consultation) that MTRs currently priced at pure LRIC are 'no longer' a significant barrier to MSPs offering competitive packages with unlimited off-net voice bundles. Vodafone contended that current rates do not present a barrier to unlimited off-net bundles and suggested that ComReg had not demonstrated the existence of barriers related to the creation of off-net calling packages at current rates (see paragraphs 13 and XVI of its Submission). Vodafone (in paragraphs XV, 12, 13 and 14 of its Submission) went on to state that ComReg had failed to demonstrate: any benefits to the market or consumers of pure LRIC; that existing rates had distorted the market, restricted competition or are above an efficient level of cost impacting carrier's ability to offer off-net calling plans; the existence of barriers related to the creation of off-net calling packages at current rates; or that a lower termination rate would lead to greater flexibility, competition and diversity in consumer offerings.
- A 4.46 In conclusion, Vodafone (in paragraph 14 of its Submission and referencing paragraph 4.75 of the Consultation) stated that ComReg had not demonstrated that lower Termination Rates than those that currently in place in the market would lead to greater flexibility, competition and diversity in consumer offerings.

Regulatory best practice

- A 4.47 Vodafone submitted no comments concerning this section.

ComReg's Issue Assessment – Appropriateness of pure LRIC

- A 4.48 ComReg notes Vodafone's view that pure LRIC is not the most appropriate methodology for setting Termination Rates in Ireland and that material presented by ComReg based on efficiency, competition and equity considerations, in conjunction with the proposed rates, do not support this conclusion (paragraphs X and 2 of its Submission).
- A 4.49 Having considered the views expressed in Respondents' Submissions, and having reviewed the argumentation presented in the Consultation document and the reports of its consultants ComReg remains of the view that pure LRIC is the best approach in order to achieve ComReg's statutory objectives including its objectives under Regulation 8 and 13 of the Access Regulations.

- A 4.50 In addition, as set out in the Consultation (see paragraphs 4.76 – 4.80), this approach is consistent with the existing pricing decisions (the 2012 Pricing Decision and the 2016 MTR Decision), takes utmost account of the 2009 Termination Rates Recommendation and is regarded as regulatory best practice given the fact that only one EU Member State (Finland) does not apply a costing (or benchmarking) approach that uses BU pure LRIC for MTRs (see Figure 6). Both in the Consultation in Section 4.2.2 and in the RIA in Sections 6.5.1 and 6.5.2, and in the AM Consultation Pricing Report in Section 3.2 ComReg demonstrated that pure LRIC is the most suitable methodology to promote efficiency and sustainable competition and to maximise consumer benefits. In particular, as stated in the Consultation in paragraph 4.83, ComReg makes the following points; pure LRIC best approximates marginal cost pricing which is the best means of achieving allocative efficiency; in principle first best pricing, i.e. the price levels found in a competitive market can be approximated by pure LRIC (paragraphs 4.51 to 4.56 of the Consultation); low termination rates resulting from pure LRIC leads to greater diversity in consumer offerings (paragraph 4.75 of the Consultation).
- A 4.51 ComReg also notes that the primary basis for the European Commission's 2009 Termination Rates Recommendation is that Termination Rates based on LRIC will promote efficient production and consumption and minimise competitive distortions². Further discussion of the points raised by Vodafone in paragraphs XII, XIII, XV and XVI of its Introduction are contained in paragraphs A 4.44, A 4.45, A 4.77 to A 4.81, A 4.92 and A 4.101 to A 4.102
- A 4.52 [X [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]]. ComReg is of the opinion that due to the two-sided nature of call termination (in both the fixed and mobile markets), a pure LRIC approach will eliminate competitive distortions in the termination markets by reducing the risk of cross-subsidisation between operators (by more efficient pricing). This in ComReg's view will contribute to ensuring a level playing field between all fixed operators, and also between all mobile operators. As set out by AM (see Section A.3 of AM Decision Pricing Report), ComReg's position is consistent with the 2009 Termination Rates Recommendation and the approach adopted by almost every other EU regulator in the last decade.

² European Commission, *Commission Recommendation of 7.5.2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU*, Article 13.

A 4.53 The Explanatory Note to the 2009 Termination Rates Recommendation stated that:

“...above-cost termination rates can give rise to competitive distortions between operators with asymmetric market shares and traffic flows. Termination rates that are set above an efficient level of cost result in higher off-net wholesale and retail prices. As smaller networks typically have a large proportion of off-net calls, this leads to significant payments to their larger competitors and hampers their ability to compete with on-net/off-net retail offers of larger incumbents. This can reinforce the network effects of larger networks and increase barriers to smaller operators entering and expanding within markets.”

A 4.54 While recognising that the modelled MTRs lie at the lower end of the BEREC’s termination rates report as at July 2018³, AM in Section A.3 of the AM Decision Pricing Report explains that the results for Ireland are not unduly low, particularly when one considers that models in other countries have not yet captured the efficiencies from more recent technologies (e.g. models in Denmark, Malta and Norway do not model the impact of 4G or S-RAN) and few regulators have explicitly set MTRs to 2021 thus far. AM in Figure 2.1 (of its AM Decision Pricing Report) presents a benchmark of mobile termination cost results to 2021 from other countries and highlights France, Portugal and Norway as potentially having lower rates than those in the MTR Decision Model. Paragraph A 4.18 above discusses these differences further.

A 4.55 ComReg next considers the comments made by Vodafone in terms of the factors discussed by ComReg in Section 4.2.2 of the Consultation document (and as set out in paragraphs A 4.37 to A 4.46 above).

Two-sided market structure

A 4.56 In response to Vodafone’s comment as summarised in paragraph A 4.37 above, where it stated that ComReg failed to demonstrate in the Consultation why LRAIC and LRAIC+ are less appropriate than LRIC in preventing market distortion, ComReg refers to its Consultation and the AM Consultation Pricing Report and further clarifies its position by making the following points.

³ BEREC report “Termination rates at European Level January 2018’ dates 14 June 2018.

- A 4.57 As set out in section 3.21 of the AM Consultation Pricing Report, the absence of regulation can lead to excessive pricing, where operators seek to discourage off-net calling and encourage on-net calling. In the case of unregulated on-net calling, each operator can determine how much of its common costs will be recovered from the termination service (in the form of the charges it levies to customers for on-net calls from mobile to mobile for example). Given the levels of on-net offers (i.e. charges for terminating mobile or fixed calls from/to customers within its network), low levels of common costs are recovered from such services.
- A 4.58 As discussed in paragraph 4.28 of the Consultation document, excessive pricing could have an impact at both wholesale and retail levels. At the wholesale level, operators that send more traffic off-net than they receive would face overall higher costs than operators that have a more favourable on-net / off-net profile. The use of a LRAIC approach, for example, for off-net calls, seeking to recover common costs in the termination rate charged by one network operator to another, may impose a significant burden on small operators / new entrants. ComReg is concerned that an over- allocation of such costs would impose a significant burden on small operators / new entrants in particular given such MSPs would have a higher proportion of off-net calls compared with bigger and more established network operators. This would increase barriers to entry by making it extremely difficult for such small operators / new entrants to compete.
- A 4.59 Similarly a LRAIC+ approach, which involves the calculation of a mark-up on the LRAIC cost to capture other costs (e.g. business overheads), would exacerbate the impact on smaller network operators as they would pay a disproportionate contribution to such costs by virtue of the fact that they have a higher proportion of off-net traffic than larger networks. Again this would make it extremely difficult for such operators to compete.
- A 4.60 In conclusion, while operators will always be incentivised to offer on-net and off-net price differentials to prevent its customers switching to other operators, ComReg remains of the opinion (as set out in paragraph 4.31 of the Consultation document) that setting termination rates on a LRIC basis will go some way to alleviating these problems.

- A 4.61 Vodafone's commented (see paragraph A 4.38 above) that ComReg had failed, in deciding on the proposed rates, to consider its regulatory objective of encouraging efficient investment. ComReg is of the opinion that it is appropriate to taken into account the impact on market investment as a whole when considering the impact of Termination Rates on investment. It is not appropriate to consider any one Service Provider in isolation as there is an interdependency between Service Providers. One Service Provider providing termination on its network to another Service Provider is also likely to be sending traffic for termination to the other Service Provider. There may be imbalances in traffic between Service Providers such that one Service Provider receives more termination traffic from another Service Provider than it sends, in which case, with equal Termination Rates, one Service Provider receives more in termination payments from the other Service Provider than it pays out to that Service Provider.
- A 4.62 If Termination Rates are set based on pure LRIC then the Service Provider, on balance, is a net recipient of termination income, is receiving payment based on efficiently occurred costs. The Service Provider that, on balance, is a net payer of termination charges, is only paying for efficiently incurred costs. If Termination Rates were based on LRAIC+ then the Service Provider that is the net payer would be paying not just for the efficiently occurred costs associated with call termination of its calls but would also be paying for joint and common costs associated with the business of the net recipient of termination income.
- A 4.63 ComReg considers that pure LRIC based Termination Rates have two key impacts on investment. One is that net payers of termination charges pay only for efficiently incurred costs. As a result those Service Providers have extra resources to invest. The second impact of pure LRIC based Termination Rates is that over the lifetime of a ComReg Decision, Service Providers have an incentive to invest to reduce their cost levels for providing call termination to below the rates determined for the ComReg Decision. When Termination Rates are set to decline there is an incentive for Service Providers that are net recipients of termination income to argue for Termination Rates to remain as they are currently (i.e. at higher levels). Any decrease in Termination Rates has a negative impact on the revenue and profitability of such Service Providers. Those Service Providers may then argue that this will impact their investments. However maintaining Termination Rates at higher levels in such a situation would also impact those Service Providers that are net payers as they would not obtain the positive impact of reduced termination rates (including the positive impact on investment).

- A 4.64 Based on the argumentation in the previous paragraph ComReg's view is that a LRIC approach (as opposed to a LRAIC or LRAIC+) will ensure greater efficiency in the provision of the termination service, as only the incremental costs associated with the provision of these services can be recovered. Termination rates based on a LRAIC or LRAIC+ approach would act as a deterrent to efficient investment.
- A 4.65 AM also addresses this concern, from a different viewpoint, in Section A.5 of the AM Decision Pricing Report, stating that there would not be any material negative effects on investment, given the small net financial impact on operators of this regulation and given that most investment is focused on data services.
- A 4.66 Vodafone raised the concern (as set out in paragraph A 4.38) that ComReg had failed to consider the impact of the proposed rates on all parties. In reply ComReg would like to clarify that it is setting Termination Rates based to a large extent on information provided by MSPs under a SIR. Excessive MTRs could have a negative impact on consumers as they could distort competition in downstream retail markets and would act as a barrier to entry for new entrants and so restrict competition. A LRIC approach benefits consumer interests and facilitates more effective competition. ComReg would also like to point out (and as set out in Section A.5 of the AM Decision Pricing Report) that Vodafone will make savings on its termination payments (with the lower rates) and these savings will assist Vodafone to address the unrecovered common costs associated with pricing incoming MVCT at pure LRIC.

A 4.67 ComReg would also like to refer to section A.5 of the AM Decision Pricing Report, in which AM refers to a number of comments made by Vodafone which appear to be suggesting that maintaining the current rates is preferable to reducing them. As set out by AM, the 2009 Termination Rates Recommendation is not only concerned with the level of MTRs, but also that the costs used should reflect the technologies used to provide voice termination services during the regulatory period. In particular, Article 12 of the 2009 Termination Rates Recommendation states that “*the cost model should be based on the efficient technological choices available in the timeframe considered by the model, to the extent that they can be identified.*” AM goes on to state that the existing MTRs were set using the previous MTR model and reflected the technologies identifiable at that time of its development (i.e. 2G and 3G). At the time of the development of the new MTR model technologies such as 4G, Ethernet transmission and single RAN were identifiable and acknowledged as efficient, and therefore suitable for capturing in the new MTR model. AM makes the point in that these new, more efficient technologies will inevitably lead to a reduction in the efficient unit costs of traffic and it is entirely reasonable to reflect these reductions in forward-looking termination rate setting.

Associated Externalities

A 4.68 In response to Vodafone’s comments (as summarised in A 4.39) that competitive distortions do not exist and rates are currently very low already, ComReg is of the opinion that competitive distortions can be caused by high MTRs, where for example high termination rates lead to an increase in a Service Provider’s rival’s costs in order to give the charging Service Provider a competitive advantage. ComReg is therefore not in favour of a mark-up on termination rates (e.g. a LRAIC+ approach) as it would have a negative impact on competition.

A 4.69 As regards the rates being 'very low already', ComReg would point out that other countries (e.g. Malta, Portugal and Norway) have MTRs moving towards or already at the rates in the MTR Decision Model, and most EU regulators have set rates on a declining path for a number of years. MTRs in some other countries which operate a bill and keep regime (such as Singapore) have zero MTRs. In response to the comment made by Vodafone in paragraph XVII of its Submission that the rates proposed by ComReg are considerably out of line with the figures calculated in other EU countries, please refer to paragraph A 4.18 above for a discussion of this point.

- A 4.70 Vodafone's commented (as summarised in A 4.40) that there is no evidence that setting termination rates marginally above incremental cost could result in the calling party initiating an inefficiently low number of calls. ComReg considers that, in general, high termination rates could place a customer outside its call allowance and so reduce the number of calls to customers on other networks.
- A 4.71 Regarding the effect of marginal increases above existing MTR levels on existing retail rates, ComReg is of the opinion that high termination rates would have the effect of increasing the margin earned by an operator with large market share but would have a negative effect on its competitors by increasing their costs and so reducing their margins. If a rival operator decided to pass on this cost in the form of higher retail charges, this would have the effect of reducing its competitiveness so benefitting the SMP operator further. Lower termination rates on the other hand will in ComReg's opinion tend to lead to lower retail prices resulting in an increase in the consumption of minutes of use per month.
- A 4.72 AM in section A.5 of its AM Decision Pricing Report notes that Vodafone's claim that "*ComReg has not justified why call externalities should not result in a mark-up of termination prices*" is incorrect. As set out in Section 3.2.2 of the AM Decision Pricing Report, the presence of call externalities should result in the receiving party having to charge for answering a call i.e. an effective decrease in the net payment of the calling party, rather than an increase. The existence of call externalities means that the efficient call termination rate should be lower than the terminating cost.
- A 4.73 Finally, in response to Vodafone's comment as summarised in A 4.41 that ComReg has not demonstrated that applying pure LRIC will further prevent distortive effects of TMNEs. ComReg would like to clarify that the existence of TMNEs can lead to inefficiencies and competition problems, where for example incumbent operators charge higher off-net prices compared to on-net prices. A new entrant would therefore find it hard to attract customers since the prices for terminating calls on its network would be high and therefore fewer calls would be made to the new entrant's networks. This can act as a barrier to entry or expansion or force such operators out of the market thus creating problems for consumers. A termination rate based on a pure LRIC approach will have the effect of reducing the size of the possible differential between off-net and on-net tariffs and so reduce the scope for TMNEs.

Relationship to market competitiveness and efficiency

- A 4.74 In responding to Vodafone's concerns (as set out in paragraph A 4.42), ComReg would like to refer to paragraph 4.53 of the Consultation document where it discussed the effect of marginal increases in Termination Rates. ComReg remains of the view that higher Termination Rates would lead to a reduction in the number of calls made by the consumer which would lead to welfare declining. The consumer (and the new entrant) would therefore benefit less from high termination rates.
- A 4.75 Vodafone pointed to ComReg's statement (as set out in paragraph A 4.43), that there is no evidence that pure LRIC based MTRs would have an adverse effect on voice calling competition for voice calling. Vodafone asserted that ComReg have not demonstrated this nor that the use of LRAIC+ would have an adverse effect. ComReg would argue that higher Termination Rates will distort competition by raising, for example, new entrants' costs. As termination rates can affect retail prices, any increase in rates arising from above cost termination rates could have the effect of reducing called minutes and therefore consumer welfare.
- A 4.76 It is also notable that according to the European Commission, MTR/FTR tariff regulation based on BU pure LRIC is the only effective measure to counteract the competition problem due to market power for call termination and to provide investment incentives (2009 Termination Rates Recommendation, Point 6).

Impact on relevant markets

- A 4.77 In response to Vodafone's questioning of the positive impact that further lowering the MTR will have on the relevant retail market (in paragraph 10 and 12 of its Submission and as set out in paragraph A 4.44 and A 4.45), ComReg considers that lowering MTRs will further assist and encourage operators in offering bundles of inclusive minutes (see below for further discussion of this point).

A 4.78 AM in section A.4 of its AM Decision Pricing Report provided a detailed response to Vodafone's comment (as set out in paragraph A 4.44) that Eircom's per minute charges to mobile networks shows an increase in the per minute charge post the reductions in MVCT. AM argue that Eircom's fixed line packages with voice in 2018 include unlimited calls to Irish mobiles, implying that the effective per-minute rate is zero. As regards the rates quoted in Fig 3 of Vodafone's Submission, AM is of the opinion that the rates quoted are misleading and unlikely to be charged in many instances. In response to Vodafone's comment that there is no evidence that reducing MTR rates produces any customer benefit, ComReg would point to Section A.4 of the AM Decision Pricing Report in which it observes that the European Commission undertook a study in 2016 to assess the impact of the 2009 Termination Rates Recommendation and whether its implementation has produced any benefits (**'2016 Assessment of the Termination Rates Recommendation'**)⁴. The European Commission states that the study suggests that, where the 2009 Termination Rates Recommendation has been implemented:

- termination rates have decreased significantly;
- the difference between mobile and fixed termination rates has been reduced, addressing the issue of fixed operators subsidising mobile operators;
- the resulting level playing field has contributed to a decrease in retail prices, an increase in traffic volumes and the launch of new offers; and
- this has led to important benefits for competition, consumers and social welfare.

A 4.79 In response to Vodafone's claim (as set out in paragraph A 4.44) that ComReg has not demonstrated any link between increased volume in consumer bundles offered to customers and reducing MTR rates, ComReg would like to refer to Section A.4 of the AM Decision Pricing Report, where it refers to a previous report produced for ComReg over Q3 2012- Q2 2014 (**'2016 Report on Changes in the Mobile Market in Ireland'**)⁵, which identified an increase by 40% in the average bundled minutes and stated that:

⁴ See <https://ec.europa.eu/digital-single-market/en/news/termination-rates-recommendation-helps-achieve-lower-and-more-consistent-rates-new-study-shows> 'Assessment of the 2009 Termination Rates Recommendation and costing methodologies for estimating termination rates'

⁵ See <https://www.comreg.ie/publication/mobile-termination-rates-analysis-mason-final-report/>

Relatively few mobile and fixed retail packages in Ireland include unlimited calls to off-net mobile networks. However, these offers are beginning to emerge as mobile termination rates decline, both in Ireland and overseas.

A 4.80 Vodafone (as set out in paragraph A 4.45) contends that current rates do not currently present a barrier to unlimited off-net bundles. This, in AM's opinion, is not a justifiable reason for not updating cost results using a new model for the next regulatory period.

A 4.81 Vodafone in its Submission (see paragraph A 4.45) stated that ComReg had not demonstrated the impact of current rates on a number of factors, including the market, consumers, competition, off-net plans, flexibility, and diversity of consumer offerings. AM in Section A.5 of its AM Decision Pricing Report notes that the potential positive impacts on competition and consumer welfare were examined by the European Commission before the 2009 Termination Rates Recommendation was finalised, and it concluded that there would be such benefits.⁶ The European Commission has continued to consider these impacts as Member States have revisited their market analysis in relation to voice termination over the last decade. For example, in its letter regarding the mobile termination market review in Germany in 2014⁷, the European Commission states that evidence at that time appeared to confirm that the introduction of wholesale MTRs based on pure LRIC resulted in significant consumer welfare gains. The studies it cited were:

- *“The welfare effects of mobile termination rate regulation in asymmetric oligopolies: The case of Spain”*, by Sjaak Hurkens and Angel L. Lopez (October 2011); and
- *“Welfare Analysis of Regulating Mobile Termination Rates in the UK (with and Application to the Orange/T-Mobile Merger)”* David Harbord and Steffen Hoernig (March 2010). This has since been republished in December 2015.

A 4.82 AM also referred to a study in 2013 by SEO Economic Research which also concluded that pure LRIC is a proportionate measure.⁸

⁶ See, for example, the Working Document regarding Implications for Industry, Competition and Consumers, available at http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2009/sec_2009_0599_en.pdf, Chart 7

⁷ See [https://circabc.europa.eu/webdav/CircaBC/CONNECT/e-cctf/Library/01%20-%20Commission%20Decisions/Commission%20Decisions%202014/DE-2014-1605%20Adopted_EN\(0\).pdf](https://circabc.europa.eu/webdav/CircaBC/CONNECT/e-cctf/Library/01%20-%20Commission%20Decisions/Commission%20Decisions%202014/DE-2014-1605%20Adopted_EN(0).pdf)

⁸ See <http://www.seo.nl/pagina/article/regulation-of-fixed-and-mobile-termination-charges/>

- A 4.83 The wide-ranging study undertaken by the European Commission in 2016 (as set out in Section A.4 of the AM Decision Pricing Report and paragraph A 4.78 above), also concluded that implementing a pure LRIC-based MTR in accordance with the 2009 Termination Rates Recommendation has led to important benefits for competition, consumers and social welfare across Member States. In particular, one conclusion was that the implementation has helped to level the playing field for competition i.e. it has helped to “alleviate competitive distortions”.
- A 4.84 Therefore, we can see that multiple analyses, including several by the European Commission, have concluded that there are clear benefits from the approach taken in the 2009 Termination Rates Recommendation.
- A 4.85 ComReg would also add that it considers that rates based on LRIC have been proven to lead to those benefits. The actual maximum rate based on LRIC comes from a consulted upon model. It stands to reason that if rates based on LRIC from previous decisions have been shown to confer benefits then lower rates based on the updated BU Model in this Decision would at the least confer those same benefits and could be expected to lead to an improvement in the level of benefits.

ComReg’s Final Position – Question 2: Appropriateness of pure LRIC

- A 4.86 ComReg’s final position with regard to Question 2 is set out in paragraph 4.107 above.

Issue raised – Recovery of Common Costs

- A 4.87 In the Consultation (paragraphs 4.35 and 4.137), ComReg noted that common costs, unrecovered through LRIC, in the case of MNOs and FNOs other than Eircom, can be allocated to other services by operators as they see fit. ComReg also said that, in Eircom’s case, they may need to be recovered, at least in part, from other regulated services and that this would be considered under separate price setting exercises. Paragraphs A 4.88 to A 4.92 below set out a number of related comments made by Eircom and Vodafone. ComReg’s assessment of such comments is then set out in paragraphs A 4.93 to A 4.102.

- A 4.88 Eircom (in paragraph 10 of its Submission) states that it is imperative that it is allowed to recover all of its efficiently-incurred fixed and common costs. It goes on to state that neither the Consultation nor the AM Consultation Pricing Report gave clarity as to where these fixed and common costs ought to be recovered by Eircom and therefore leaves open the prospect of stranded costs which is detrimental to Eircom being able to compete fairly. Eircom also states that this issue should be clarified before the finalisation of the ComReg Decision.
- A 4.89 In referencing ComReg's statement (in paragraph 4.137 of the Consultation document) that Eircom can recover common costs, at least in part from other regulated services, Eircom (in paragraph 11 of its Submission) claims that this approach is too vague and demonstrates that ComReg has not adequately considered the issue of Eircom's potentially stranded costs.
- A 4.90 Vodafone (in paragraph 4 of its Submission) states that ComReg suggests that operators have in the past, or can in the future, recover under-recovered common costs through increased charges but that no in-depth analysis or attempt to prove this statement is offered. Vodafone (in paragraph V of its Introduction) highlights that this approach will have a larger effect on operators who do not have other regulated products with SMP against which price increases can be imposed without being moderated by competition effects.
- A 4.91 Vodafone also made the point (in paragraph 4 of its Submission) that ComReg suggested that Eircom could recover some of these costs in part from other regulated services. Vodafone said that this could potentially increase costs for MSPs and FSPs.

A 4.92 Vodafone goes on to argue (in paragraph XII and XIII of its Introduction) that a costing methodology based on the application of the marginal cost rule, which includes Pure LRIC, will inevitably lead to an under-recovery of costs which ultimately leads to a distortion of market forces and existing market equilibria. Vodafone states that the “waterbed” effect may be the result of such a measure together with reduced profitability which in its opinion will have a knock-on effect on investment as well as innovation and ultimately overall welfare. It goes on to state that the implementation of LRAIC+ 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. Vodafone (in paragraph XIV of its Introduction) states that ComReg has failed to provide sound empirical evidence for the effects it ascribes to lower termination rates. Vodafone goes on to state that there will be some detriment to mobile operators (who will stand to lose money which would otherwise be available for investment in innovation or network quality). While there is evidence that fixed operators gain from a decrease in termination rates, Vodafone is of the opinion that it is less clear that consumers have actually benefitted.

ComReg’s Issue Assessment – Recovery of Common Costs

A 4.93 In response to comments made by Eircom (as set out in paragraphs A 4.88- A 4.89 above) and Vodafone (in paragraph A 4.90), AM and TERA make a number of points as set out below.

A 4.94 AM in Section A.7 of its AM Decision Pricing Report makes a distinction between MNOs and Eircom. In the case of MNOs, MTRs are the only regulated service and so MNOs can recover any unrecovered costs from their other unregulated services. In the case of Eircom, AM is of the opinion that it should be able to recover the unrecovered costs of its mobile arm from other services sold by its mobile arm. AM point out that this issue is raised by the European Commission in their Explanatory Note to the 2009 Termination Rates Recommendation, which states “*even if wholesale termination rates were set at zero, terminating operators would still have the ability to recover their costs from non-regulated retail services.*”⁹ This is because mobile operators have numerous degrees of pricing freedom in the retail market. Regarding Vodafone’s point that a lack of SMP in other areas will mean that a mobile operator’s ability to increase prices will be moderated by competition effects ComReg note that this should not be an issue as the competing mobile operators will also be trying to recover common costs.

⁹ See http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2009/sec_2009_0600_en.pdf, page 17

- A 4.95 AM concludes that the issue is more complicated in circumstances where there are multiple regulated services (e.g. for the Eircom fixed arm, especially if origination is regulated); stranded costs could therefore occur if Eircom is prevented from being able to recover those costs from another service.
- A 4.96 AM in Section A.5 of its AM Decision Pricing Report point out that operators including Eircom and Vodafone will make savings on their interconnect payments which will provide them with additional revenues to address unrecovered costs associated with MVCT and FVCT.
- A 4.97 TERA in Section 2 of its TERA Decision Specification Report identifies that it is very difficult to specify what share of common costs are specific to FVCT and in its opinion there is unlikely be to a reduction in total common costs if an operator stops providing a fixed termination service.
- A 4.98 BEREC in its opinion on Case NL2012/1284 – Fixed call termination Netherlands, also considered the issue of common cost recovery and identified (p. 13) that:
- “There is an objective reason to recover common costs on retail markets rather than on the wholesale termination markets. By taking into account pure incremental costs when determining termination rates operators are being encouraged to recover their common costs on retail markets (on which there is a price constraint) and not on a monopolistic market (on which there is a risk of excessive prices).”*
- A 4.99 In the 2012 Pricing Decision, ComReg was of the view that in the case of the regulated fixed incumbent Eircom, efficient costs no longer recovered from voice termination services could be recovered from other wholesale and/or retail voice/non-voice services as appropriate. That Decision concluded that no particular service should require a significant price increase in order to recover the cost of the network. Having considered the views of interested parties, ComReg is of the view that efficient costs unrecovered from Eircom’s voice termination services could be recovered from other (regulated and unregulated) wholesale and/or retail voice/non-voice services as appropriate. ComReg has reviewed the returns in Eircom’s Historical Cost Separated Accounts covering the financial years ending 2012 to 2018 and is of the view that the combined returns made between wholesale and retail services are sufficient to cover any under recovery of common costs for voice termination services.
- A 4.100 In response to the comment made by Vodafone (as set out in paragraph A 4.91) that there could be a potential increase in costs for MSPs and FSPs, TERA in Section 2 of the FTR Decision Specification Document points out that FVCT should be a sum-zero game between operators.

A 4.101 AM in Section A.3 of its AM Decision Pricing Report agrees with the statement made by Vodafone (as set out in paragraph A 4.92 above) that any costing based on the application of the marginal cost rule to a single service in a multi-service firm when there are large fixed costs will lead to that single service not recovering its allocated total (average) costs, only its marginal costs. AM identifies however that in a multi-service firm, there are other services which are available to bear the burden of cost recovery by pricing such services in such a way as to balance overall cost recovery in the presence of one service regulated at pure LRIC. This has been discussed further in paragraphs A 4.94 to A 4.95 above.

A 4.102 Regarding Vodafone's concerns as to the impact of Pure LRIC on profitability, investment, innovation and consumer welfare, AM in Section A.3 of its AM Decision Pricing Report identifies that given that substantial proportions of the payments net off through two-way traffic flows, there is a very small impact on profitability for the operators. This in AM's opinion will have a negligible effect on investment incentives for those operators that may be slightly negatively affected. As regards innovation, AM make that point that innovation for voice services in the Irish market is very limited as of 2018 as voice is a saturated and stable market, and innovation for mobile is focused on non-voice services, which are largely unaffected by the net MVCT position which an operator may face. AM also points out that lower MTRs have led to a reduction in retail charges for off-net calls which has increased the propensity for consumers to make off-net calls, with off-net calls increasing by over 50% between 2012 and 2017. Such changes, in AM's opinion, are beneficial for consumers as they have increased the utility of retail offers. In response to Vodafone's concerns that lower termination rates will be detrimental to mobile operators, AM in Section A.3 of its AM Decision Pricing Report identifies that given the domestic Irish interconnection market is a 'closed system', network operators will stand to gain cashflow that would otherwise have been paid out to other operators. AM in Section A.5 of its AM Decision Pricing Report discusses the potential positive impacts on competition and consumer welfare which has been examined by the European Commission since before 2009 (this is summarised in paragraph A 4.81 to A 4.84 above).

ComReg's Response to Issue – Recovery of Common Costs

A 4.103 ComReg is of the view that efficient costs no longer recovered from Eircom's voice termination services could be recovered from other (regulated and unregulated) wholesale and/or retail voice/non-voice services as appropriate.

Question 3 Responses - Economic Cost Recovery (Section 4.3 of Consultation)

A 4.104 In the Consultation ComReg discussed the methods that could be used to determine the level of costs to be recovered each year. ComReg was of the preliminary view that economic depreciation is appropriate for the MVCT market and that depreciation determined on the basis of a tilted annuity approach is appropriate for the FVCT market.

A 4.105 ComReg asked the following question:

Q. 3 Do you agree with the preliminary opinion of ComReg regarding the choice of depreciation methods used in the calculation of the MTRs and FTRs? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.

A 4.106 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.107 Eircom said that it would have been preferable to use a consistent approach in the case of FVCT and MVCT. Vodafone expressed its reservations concerning the complexity of the model and the potential for wrong assumptions or data being used.

Issues raised economic cost recovery

A 4.108 Issues were raised concerning the following points:

- Consistent approach between FVCT and MVCT
- Complexity of model and potential for wrong assumptions/data

Issue raised – Consistent approach between FVCT and MVCT

A 4.109 Eircom (in paragraph 13 of its Submission) said that it did not see a compelling case for moving to economic depreciation in the case of MVCT. Eircom (in paragraph 15 of its Submission) said that it would not expect the volume of minutes terminated on mobile networks to vary significantly over the forecast period. It was unclear to Eircom why ComReg did not follow a consistent approach for both FVCT and MVCT and apply tilted annuity in both cases – thereby avoiding the complexities that may be associated with the economic depreciation approach.

ComReg’s Issue Assessment

A 4.110 AM (Section A.8 of AM Decision Pricing Report) reviewed Eircom’s point and said that the modelled mobile-terminated minute volumes in fact do vary considerably over the lifetime of the modelled business and also migrate between the 2G and 3G networks. Therefore, the economic recovery of avoided costs over the different technologies in the pure LRIC calculation is best captured by economic depreciation. ComReg remains of the opinion that the most suitable form of ensuring cost recovery for MVCT is economic depreciation and the most suitable form for FVCT is tilted annuity.

ComReg’s Response to Issue – Consistent approach between FVCT and MVCT

A 4.111 ComReg considers that for economic cost recovery choosing the most suitable form of depreciation takes precedence over using the same methodology for consistency (for FVCT and MVCT markets).

Issue raised – Complexity of model and potential for wrong assumptions/data

A 4.112 Vodafone (in paragraph 16 of its Submission) quoted from paragraphs 4.97 and 4.98 in the Consultation to support its points that the output of the model is dependent on a number of key assumptions and at best is a complex forecasting tool. Vodafone added that it was not clear that ComReg had analysed the risk associated with such a model nor conducted any sensitivity analysis to gauge the impact of changed assumptions.

ComReg's Issue Assessment

A 4.113 AM (MTR Decision Specification, Annex D4) reviewed Vodafone's point and noted that operator data was used where it had been provided, and that inputs from the 2016 MTR model were used where there were gaps. AM noted that Vodafone has not raised any specific issues with forecasts or projections, despite having the opportunity to consider the parameters in the model and to make alternative suggestions if it considered the assumptions or data to be materially out of line. Vodafone also did not provide any additional recent information on its mobile business over the course of the Consultation.

ComReg's Response to Issue – Complexity of model and potential for wrong assumptions/data

A 4.114 In response to the concerns of Vodafone, ComReg would like to clarify that it presented the results of various sensitivity tests in the Consultation and went into detail as to what the differences between the results of the MTR Consultation Model and the 2016 MTR model related to.

NON-CONFIDENTIAL

Question 4 Responses - Modified Scorched Node Approach – Mobile Networks (Section 4.4 of Consultation)

A 4.115 In the Consultation ComReg discussed a number of options that could be used to determine the number of nodes for the MTR model. ComReg came to the preliminary opinion that the proposed MTR model should be based on data provided by MSPs using a modified scorched node approach.

A 4.116 ComReg asked the following question:

Q. 4 Do you agree with ComReg's preliminary view that a modified scorched node approach is appropriate for the modelling of mobile networks? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.

A 4.117 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.118 Eircom agreed with the use of the modified scorched node approach for the modelling of mobile networks. Vodafone had no observations to make.

Issues raised regarding Scorched Node Approach – Mobile Networks.

A 4.119 No issues were raised concerning using a modified scorched node approach.

Question 5 Responses - Scorched Node Approach – Fixed Networks (Section 4.5 of Consultation)

A 4.121 In the Consultation ComReg discussed a number of options that could be used to determine the number of nodes for the FTR model. ComReg came to the preliminary opinion that the proposed FTR model should be based on Eircom's current deployment of NGN nodes.

A 4.122 ComReg asked the following question:

Q. 5 Do you agree with ComReg's preliminary view that a scorched node approach is appropriate for the modelling of fixed networks? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.

A 4.123 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.124 Eircom agreed with the use of the scorched node approach. Vodafone had no observations to make.

Issues raised regarding Scorched Node Approach – Fixed Networks.

A 4.125 No issues were raised concerning the scorched node approach.

Question 6 Responses - Symmetry of Termination Rates (Section 4.5 of Consultation)

A 4.127 In the Consultation ComReg expressed its opinion that symmetric termination rates create a level playing field that removes impediments to competition. ComReg came to the preliminary view that termination rates should be set based on the costs incurred by an efficient operator and hence should be symmetric.

A 4.128 ComReg asked the following question:

Q. 6 Do you agree that regulated maximum Termination Rates should be symmetric? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual or other evidence supporting your position.

A 4.129 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.130 Eircom provided argumentation supporting the symmetry of termination rates. Vodafone had no observation to make in this regard.

Issues raised regarding symmetry of termination rates.

A 4.131 Issues were raised concerning the following:

- Deviation from symmetry
- Practicality, stability and predictability

Issue raised – Deviation from symmetry

A 4.132 Eircom (in paragraph 21 of its Submission) said that any proposal to deviate from symmetry or allow the operators of smaller networks to charge higher rates than the appropriate symmetric rates simply supplies incentives to game the Decision by managing the criteria where symmetry would not apply.

ComReg's Issue Assessment

A 4.133 ComReg sees no reasons to deviate from symmetry or allow operators of smaller networks to charge higher rates than those derived from the relevant models.

ComReg's Response to Issue – Deviation from symmetry

A 4.134 ComReg is of the opinion that there is no reason to deviate from symmetry.

Issue raised – Practicality, stability and predictability

A 4.135 Eircom (in paragraph 22 of its Submission) said that for reasons of practicality, stability and predictability of outpayments for fixed and mobile calling, symmetry should apply in the case of voice call termination.

ComReg's Issue Assessment

A 4.136 ComReg concurs with Eircom's assessment regarding practicality, stability and predictability.

ComReg's Response to Issue – Practicality, stability and predictability

A 4.137 ComReg agrees with Eircom on this point.

NON-CONFIDENTIAL

Question 7 Responses - Consistency in Approaches to FVCT and MVCT (Sections 4.6 of the Consultation)

A 4.138 In the Consultation ComReg discussed the need for consistency of treatment between FVCT and MVCT and set out its preliminary opinion regarding specific aspects where there was a need for consistency between these markets.

A 4.139 ComReg asked the following question:

Q. 7 Do you agree or disagree that there is a need for consistency in the setting of regulated Termination Rates between the FVCT and MVCT markets? Is there in your opinion any other aspects where there is a need for consistency between those markets? Please provide reasons for your response.

A 4.140 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.141 Eircom agreed with ComReg's approach to consistency. Vodafone, while agreeing that there was a need for consistency in the approach between MTRs and FTRs, noted that the structure for MVCT and FVCT can be different.

Issues raised regarding consistency in the approaches to FVCT and MVCT

A 4.142 Issues were raised concerning the following aspects:

- Treatment of common costs not recovered under pure LRIC
- Model updating

Issue raised – Treatment of common costs not recovered under pure LRIC

A 4.143 Vodafone (in paragraph 20 of its Submission) said that it agreed that LRAIC+ should identify common costs but did not agree that operators can allocate such unrecovered costs to other services in a competitive market. Nor was it clear to Vodafone “*what the impact of increased regulated services would be as a result of ‘other price-setting exercises’*”.

ComReg’s Issue Assessment

A 4.144 This issue has been dealt with in the response to question 2, paragraph A 4.93 to A 4.102 above.

ComReg’s Response to Issue – Treatment of common costs not recovered under pure LRIC

A 4.145 ComReg’s response to this issue is set out in paragraphs A 4.93 to A 4.103 above.

Issue raised – Model updating

A 4.146 Vodafone (in paragraph 21 of its Submission) suggested that as a prudent and fair regulator ComReg should build in a 'safety margin' to the proposed rates. This would allow for later adjustment if required but should, in theory and in practice, protect against the need to increase rates. Vodafone further emphasises the need for certainty in the market combined with confidence that investment in the market would be rewarded at a predictable rate.

ComReg’s Issue Assessment

A 4.147 AM (in section 3.5 of its AM Decision Pricing Report) states that the safety margin proposed by Vodafone will already be present in the results of the model, through the application of conservative assumptions e.g. exclusion of VoLTE in the model even though it is becoming more widespread in Ireland. Analysys Mason goes on to add that Vodafone’s net revenues from call termination will be a relatively small part of Vodafone’s cashflow. In light of the above and given that the model already incorporates a reasonable return on investment through the WACC, adding an additional safety margin is therefore not reasonable in ComReg’s view.

ComReg's Response to Issue – Model Updating

A 4.148 In light of the above discussion, ComReg's does not agree with the proposal to build in a safety margin to the proposed rates. Termination Rates are set for a number of years into the future and should only be updated if there is evidence of significant divergence of model inputs and assumptions from reality. This will in ComReg's opinion provide certainty in the market.

NON-CONFIDENTIAL

Question 8 - Responses Inputs and Assumptions in FTR Model (Sections 5.3.1 to 5.3.5 of Consultation)

A 4.149 In the Consultation ComReg set out the proposed inputs and assumptions for the FTR model.

A 4.150 ComReg then asked the following question:

Q. 8 Do you agree or disagree with the proposed inputs and assumptions in the proposed BU pure LRIC FTR model for the purposes of determining the fixed termination rate? Please provide reasons for your response.

A 4.151 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.152 Eircom agreed in broad terms with the inputs and assumptions. It raised an issue regarding the attribution of fixed costs amongst different traffic types. It also put forward a correction regarding the use of off-net international in-payment volumes. Vodafone replied that it had no observation to make.

Issues raised regarding FTR model's inputs and assumptions

A 4.153 The following issues were raised:

- Attribution of fixed costs amongst different traffic types
- Suggested correction regarding termination minutes

Issue raised – Attribution of fixed costs amongst different traffic types

A 4.154 Eircom stated (in paragraph 25 of its Submission) that the Core NGN model continues to treat all of the (wholesale) broadband traffic as being either national handover or regional handover and this assumption of future volumes is incorrect given that a large share of the current traffic is now VUA and there is no real economic justification for an OAO to switch back to Bitstream once the costs of unbundling at Aggregation Nodes have been sunk. Eircom therefore considered that more of the fixed NGN costs would be attributable to non-broadband traffic, including external primary termination.

ComReg's Issue Assessment

A 4.155 The above issue has been addressed in the update of the NGN model where volumes have been reviewed. In addition, the impact on FTR is limited since FTR is costed in pure LRIC, therefore additional investments at this level of the network is not in the scope of pure LRIC.

ComReg's Final Position

A 4.156 ComReg has reviewed the modelling of wholesale broadband traffic and has made appropriate adjustments.

Issue raised – Correction regarding termination minutes

A 4.157 Eircom stated (in paragraph 26 of its Submission) that the volumes of national call termination are combined with the off-net (international) in-payment volumes. Eircom went on to explain that this is incorrect given that off-net volumes are handed over to national/international OAOs at the tertiary switches on the TDM network. Therefore they would not be, contrary to on-net (International) in-payment volumes, availing of national termination.

ComReg's Issue Assessment

A 4.158 The volumes used are correct. TERA used on-net (international) in-payment volumes based on a break-down provided by Eircom. The label on the row in question was incorrect resulting in the point made by Eircom. This labelling has been corrected in the version of the model made available with this Decision.

Question 9 Responses - Any other data relevant to FTR Model (Sections 5.3.1 to 5.3.5 of Consultation)

A 4.159 In the Consultation ComReg set out the proposed inputs and assumptions for the FTR model.

A 4.160 ComReg tasked the following question:

Q. 9 Do you believe that there is any other data that is relevant to the proposed BU pure LRIC FTR model? If so, this data should be provided to ComReg for consideration in any decision

A 4.161 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.162 Eircom did not consider that there was any other data that was relevant for the purpose set out by ComReg. Vodafone replied that it had no observation to make.

Issues raised regarding any other data relevant to the FTR model

A 4.163 No issues were raised.

Question 10 Responses - FTR Calculation Results (Section 5.3.8 of Consultation)

A 4.164 In the Consultation ComReg presented the preliminary results of the BU pure LRIC modelling of fixed termination.

A 4.165 ComReg asked the following question:

Q. 10 Do you agree or disagree with ComReg's preliminary views regarding the maximum FTRs that FSPs should charge as set out in this 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.

A 4.166 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.167 Eircom agreed in broad terms with the maximum FTRs calculated by the FTR model. It raised an issue regarding the recovery of fixed costs of the NGN network and more generally of common costs. It also raised an issue that the levels of FTRs create uncertainty as to where they may be set in the near future. Vodafone replied that it had no observation to make.

Issues raised regarding proposed maximum FTRs

A 4.168 The following issues were raised:

- Clarity regarding recovery of NGN fixed costs and more generally of common costs
- Uncertainty regarding termination rates in the near future

Issue raised – Recovery of fixed and common costs

A 4.169 Eircom stated (in paragraph 29 of its Submission) that it was of the view that a further reduction in call termination rates poses an immediate concern in terms of the cost recovery of fixed costs of the NGN network and more generally of common costs. Eircom added that ComReg's consultation had not provided any clarity as to how recovery of such costs would be addressed. No analysis was provided by Eircom of the materiality of the issue.

ComReg's Issue Assessment

A 4.170 In the Consultation ComReg said in paragraph 4.137 that the issue of the recovery by Eircom of common costs would be considered in separate price-setting exercises. In order to give clarity on this ComReg has looked at this issue in detail. Having considered the views of interested parties, ComReg is of the view that efficient costs no longer recovered from Eircom's voice termination services could be recovered from other (regulated and unregulated) wholesale and/or retail voice/non-voice services as appropriate. ComReg has reviewed the returns in Eircom's Historical Cost Separated Accounts covering the financial years ending 2012 to 2018 and is of the view that the combined returns made between wholesale and retail services are sufficient to cover any under recovery of common costs for voice termination service.

Issue raised – Uncertainty regarding termination rates

A 4.171 Eircom said (in paragraph 30 of its Submission) that the abatement of fixed termination rates narrows the scope for changes in the model inputs and assumptions (effectively setting a lower bound close to the zero level). Eircom was of the view this will create uncertainty amongst operators as to where the rates may be set in the near future.

ComReg's Issue Assessment

A 4.172 ComReg has taken account of the planned introduction of Eurorates for fixed termination, expected to take place in 2021. As the level of these rates are unknown at present, ComReg's considers that to reduce the possibility of maximum regulated Termination Rates decreasing through this Decision and then increasing through the implementation of Eurorates it would be better to use a glide path for the implementation of the maximum regulated FTRs derived from the FTR Decision Model and the previous rate i.e. the rate in force prior to this Decision.

Question 11 Responses - FTR Calculation Results (Section 5.3.8 of Consultation)

A 4.173 In the Consultation ComReg proposed using one single maximum FTR for the regulatory control period in recognition of the cost of implementing rate changes where there would be relatively small changes in maximum rates on an annual basis.

A 4.174 ComReg asked the following question:

Q. 11 Do you agree or disagree with the use of a mid-point of the proposed maximum rates as the maximum rate for the entire regulatory control period? 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.

A 4.175 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.176 Eircom agreed in principle with the setting of one single maximum rate for the entire regulatory control period which will provide the market with predictability provided the calculation of the rate is set to be 'revenue neutral'. Vodafone had no observation to make in this regard.

Issues raised regarding using a single mid-point rate for FTRs

A 4.177 The following issues were raised:

- Revenue Neutrality
- Mid-term review of volumes

Issue raised – Revenue Neutrality

A 4.178 Eircom agreed (in paragraph 31 of its Submission) with the setting of one maximum rate for the entire control period provided the calculation of this single rate is set to be 'revenue neutral'. Eircom said (in paragraph 32) that it considered that a simple arithmetic average did not achieve this but that in this case the use of a weighted average did not result in a materially different (maximum) fixed termination rate.

ComReg's Issue Assessment

A 4.179 ComReg has decided to implement the LRIC outputs of the FTR Decision Model via a glide path approach. Using this approach the changes in each year are important and hence using a single maximum FTR is not as relevant. As a result ComReg has decided that the maximum FTRs based on a glide path approach should be implemented on an annual basis.

Issue raised – Mid-term review of volumes

A 4.180 Eircom said (in paragraph 32 of its Submission) that the acceptance of the principle of a single maximum rate introduces future risks to achieving full recovery of Eircom's pure LRIC call termination costs in the period should the decline in termination volumes turn out to be steeper than forecast. Eircom considered (in paragraph 33 of its Submission) that ComReg should incorporate provisions in its final decision to allow a mid-term review or similar of the single rate and mitigate this risk, in the case where termination volumes are materially lower than forecast. No analysis was provided by Eircom of the potential impact.

ComReg's Issue Assessment

A 4.181 Setting a mid-point review would create uncertainty about rates in the near future. In addition, the planned implementation of Eurorates for fixed termination in 2021 cuts short the original period of time for which the results of this Decision were envisaged to remain in force. This makes a mid-point review less relevant.

Question 12 Responses - FTR Calculation Results (Section 5.3.8 of Consultation)

A 4.182 In the Consultation ComReg proposed that any change to the FTR be implemented within 90 days of the effective date.

A 4.183 ComReg asked the following question:

Q. 12 Do you agree or disagree with ComReg's preliminary views regarding the implementation of any decision on maximum FTRs that can be charged by FSPs found to have SMP in their respective call termination markets? 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.

A 4.184 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.185 Eircom was in general agreement. Vodafone had no observation to make in this regard.

Issues raised regarding implementation of maximum FTRs

A 4.186 The following issue was raised:

- Symmetric implementation by all FSPs

Issue raised – Symmetric implementation by all FSPs

A 4.187 Eircom stated (in paragraph 35 of its Submission) it was of the view that the Decision on maximum FTRs should be implemented symmetrically to all FSPs, including Eircom.

ComReg's Issue Assessment

A 4.188 The implementation of the Decision on maximum FTRs will apply to all FSPs found to have SMP in their respective fixed termination market with the same implementation time-period for all. In addition, ComReg considers that the implementation should be on the first working day of the month following at least two calendar months from the published date of the Decision so that implementation periods for fixed and mobile termination rates are at the same time.

Question 13 Responses - MTR Modelling (Sections 5.4.1 to 5.4.5 of Consultation)

A 4.189 In the Consultation ComReg provided an overview of the MTR Consultation Model (section 5.4.1), and described the proposed operator-related parameters (section 5.4.2), the proposed service-related parameters (section 5.4.3), the proposed technology-related parameters (section 5.4.4) and the proposed implementation-related parameters (section 5.4.5).

A 4.190 ComReg asked the following question:

Q. 13 Do you agree or disagree with the proposed inputs and assumptions used in the development of the proposed BU pure LRIC MTR model for the purposes of determining the mobile termination rate as set out above and detailed in the MTR Specification Document? Please provide reasons for your response with references to specific paragraphs in this Consultation.

A 4.191 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.192 Eircom in general considered the inputs and assumptions to be appropriate. Vodafone had a number of concerns with respect to the assumptions and inputs used.

Issues raised regarding MTR modelling

A 4.193 Issues were raised regarding the following:

- Market share of operator used in model
- Forecast used of voice traffic
- Including part of spectrum fees as direct cost of call termination
- The modelling timeframe
- The choice of cost drivers
- Assumption that additional sites are used to provide data services

Issue raised – Market share of operator used in model

A 4.194 Eircom said (in paragraph 38 of its Submission) that it would be worth considering increasing the 33% market share of the modelled operator to be more in line with the fixed scenario.

ComReg’s Issue Assessment

A 4.195 ComReg (and AM in its MTR Decision Specification Document) considers that there is no justification for this as there are three mobile network operators in Ireland having near 100% national population coverage and not just one operator as is the case for the fixed line network.

Issue raised – Forecast used of voice traffic

A 4.196 Eircom said (in paragraph 40 of its Submission) that the approach used to forecast voice traffic would appear to over-estimate such traffic in that no account appeared to be taken of the substitution of voice traffic by “Over the Top” applications such as WhatsApp and Skype. Eircom said that if there were lower traffic volumes then it would be expected that MTRs would increase.

ComReg’s Issue Assessment

A 4.197 The quarterly data up to 2017 indicates that average mobile-to-mobile voice usage per mobile subscriber (excluding MBB/M2M) fell for 2017 compared to 2016. Even with this fall it has been relatively static for the period 2014-2017. AM has updated the MTR model to assume voice usage per subscriber to be static after 2017. AM notes however, that with the expected growth in subscribers overall, voice usage is still expected to increase over time.

Issue raised – Including part of spectrum fees as direct cost of call termination

A 4.198 Eircom said (in paragraph 42 of its Submission) that ComReg should consider including part of the spectrum fees as a direct cost of call termination i.e. assuming a different spectrum fee would be incurred if wholesale voice call termination is not provided.

ComReg's Issue Assessment

A 4.199 ComReg considers that there are practical reasons against using the approach suggested by Eircom. If the assumption was made that spectrum is avoided when voice termination is not present then more radio equipment would be needed in that state. As AM say in the MTR Consultation Specification Document, Section D.9, *"This would lead to an increase in network costs that would offset any reduction in spectrum fees paid. By not avoiding spectrum, the network design avoids radio equipment, which will appear in the avoidable cost base instead."* Eircom did not provide any proposals for modelling spectrum fees as a direct cost of call termination. As spectrum fees are established through an auction process ComReg considers that it would not be possible to determine with reasonable accuracy the scale of spectrum fees that could be assigned as a direct cost of call termination. ComReg considers that the approach taken in the MTR Decision Model, where network avoided in the absence of MVCT is considered, rather than spectrum avoided, is reasonable. AM has not observed the spectrum avoided approach currently being undertaken in other countries.

Issue raised – The modelling timeframe

A 4.200 Eircom said (in paragraph 43 of its Submission) that a 50 year modelling timeframe is excessive.

ComReg's Issue Assessment

A 4.201 AM said¹⁰ that Eircom may be correct that sites have infinite lives, as the land area does not degrade. This would point to a long lifetime model with a terminal value. The AM assumption on the modelling period is that it is long enough that any terminal value is negligible after discounting. AM also said that a short-term model would require a terminal value to address any remaining life value. The model developed by AM is not predicting how the world of MTRs will look 50 years from now. It is modelling MTRs as if the current technologies continued into the future, a simplifying assumption. ComReg expects that new, more efficient technologies would in reality be deployed that will have lower costs of carrying voice than the MTR Decision Model. Furthermore, although the model calculates the costs over the full modelling period, it is only intended to set prices for the short-term future (2019–2022).

¹⁰ See MTR Consultation Specification Document, Section D.10

Issue raised – Choice of Cost Driver

A 4.202 Vodafone (in paragraph IX of its Submission) states that achieving the 2% Grade-of-Service for voice has always been a key driver of network site capex spend. It goes on to argue that the proposed MTR model uses a very simple methodology to combine voice and data traffic on 2G and 3G networks, with voice considered to be equivalent to a 12kb/s data stream which is added to data traffic and costs apportioned by examining the ratio of voice traffic to total traffic. This in Vodafone's opinion is a significant oversimplification of the cost drivers in building and operating a mobile network and vastly overstates the relevance of data traffic. Vodafone suggested therefore that the cost drivers used in the model must be changed to reflect the real world drivers of network capacity build.

ComReg's Issue Assessment

A 4.203 AM (in Section 3.2 of its AM Decision Pricing Report) has considered Vodafone's comments. AM clarified that while it assumed a 2% grade-of-service for voice in the 2G network design, it assumed a 1% grade-of-service for voice in the 3G network (which was based on information provided by operators under a 13D Information Request from ComReg).

A 4.204 As regards the statement by Vodafone that voice is considered to be equivalent to a 12kbit/s data stream, AM explains that this is incorrect in several ways. First, 12kbit/s is the value for 3G only, whilst 9.6kbit/s is 2G. Secondly this input is only used in dimensioning the backhaul layer, which is dimensioned using Mbit/s drivers, whereas the model dimensions the radio layer in terms of voice channels requiring all traffic streams to be converted to a Mbit/s equivalent. However, the 2G and 3G radio access networks are dimensioned in terms of voice channels, with a fixed allocation of channels for 2G data and HSPA traffic carried by HSPA asset upgrades in the 3G network.

A 4.205 In responding to Vodafone's comment that the relevance of data traffic has been vastly overstated, AM notes that while Vodafone had not provided any details of its current network planning decisions, or the accompanying decisions to purchase additional spectrum for data services, it believes that voice is not the main driver of real-world network capacity deployment.

Issue raised – Assumption regarding additional sites

A 4.206 Vodafone said (in paragraph 28 of its Submission) that the assumption in the MTR Consultation Model that additional sites are used to provide data is fundamentally incorrect and said that mobile operators build new sites for voice coverage purposes.

ComReg's Issue Assessment

A 4.207 ComReg considers that operators are increasingly concerned with investing for data (spectrum, equipment, and in the long-run, the sites to hold that data equipment). It is incorrect to describe data services as a secondary effect when voice volumes are saturated/declining, and data volumes and data revenues are growing to exceed voice. As noted in the MTR Consultation Specification Document in Section D.1, Vodafone's site deployments were relatively static over the period 2013-2016 whereas NodeB (3G access node) deployments increased significantly¹¹. In the same period voice volumes have not increased significantly whereas data volumes have grown substantially¹¹.

A 4.208 As per the D.1 of the MTR Decision Specification Document, the MTR Decision Model is not deploying significant numbers of new sites over time. It is placing more equipment in existing sites, with the equipment deployment increasingly being driven by data traffic. ComReg also notes Vodafone's statements in separate public documents regarding 4G rollout Project Spring where it said "*This highly complex and capital-intensive network expansion programme will increase the number of European 4G sites we operate to more than 80,000*"¹² and "*customers data usage has been soaring amid an on-going shift to fourth-generation (4G) devices*"¹³. The 2018 Annual Report from Vodafone, page 16, has mobile data as one of the growth engines for Vodafone¹⁴.

¹¹ Source from Vodafone's response to a SIR.

¹²

https://www.vodafone.com/content/dam/group/policy/downloads/vodafone_europe_investing_for_future_feb_2015.pdf, page 9

¹³ <https://www.irishtimes.com/business/technology/vodafone-to-invest-500m-over-next-three-years-in-ireland-1.2998543>

¹⁴ https://www.vodafone.com/content/annualreport/annual_report18/index.html

Question 14 Responses - MTR Modelling (Sections 5.4.1 to 5.4.5 of Consultation)

A 4.210 In the Consultation ComReg provided an overview of the proposed MTR Consultation Model (section 5.4.1), and described the proposed operator-related parameters (section 5.4.2), the proposed service-related parameters (section 5.4.3), the proposed technology-related parameters (section 5.4.4) and the proposed implementation-related parameters (section 5.4.5)

A 4.211 ComReg asked the following question:

Q. 14 Do you believe that there is any other data that is relevant to the proposed MTR model? If so, this data should be provided to ComReg for consideration in the final decision.

A 4.212 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.213 Eircom said that in the context of its response that it did not consider that there is other data that is relevant for the purpose set out by ComReg. Vodafone said that model does not correctly model the roll-out of a mixed voice and data network.

Issues raised regarding any other data relevant to the proposed MTR model.

A 4.214 While recognising that there were some shortcomings in relation to data availability, issues were raised concerning the following points:

- Updating of indirect capex mark-up and volume of opex as proportion of capex;
- Possible changes to worksheets in model; and
- Correct modelling of roll-out of a mixed voice and data network.

Issue raised – Updating of indirect capex mark-up and volume of opex as proportion of capex

A 4.215 Eircom said (in paragraph 46 of its Submission) that in the case of both the volume of indirect capex mark-up and volume of opex as proportion of capex, the model simply imports the corresponding values from the previous version and that it would have been preferable if these had been updated.

ComReg's Issue Assessment

A 4.216 AM noted that the data received from operators was extremely limited and did not allow for any kind of comprehensive update (Annex C.2, MTR Decision Specification Document). AM cross-referenced the modelled opex to current operator TD operating expenditures and it was found to be reasonable, as described in Annex C of the MTR Decision Specification Document. ComReg also notes that Eircom did not provide any additional data concerning this matter during the consultation period.

Issue raised – Possible changes to worksheets in model

A 4.217 Eircom (in paragraph 47 of its Submission) said that there were three aspects of the model that may require some attention before the rates are finalised. In particular Eircom asked why there are individual columns for "Three" and "O2" in 2016 in the worksheet "CalibChks" when these companies had been merged since 2014. For the same worksheet, cell ranges G83 to J83 Eircom asked if the "Divide by zero" cells should be deleted. In the worksheet "pA" Eircom says there is a graph that is consistent around 350 from 2005 up to 2045 before suddenly falling to zero. Eircom did not believe that such a metric was a sound basis for modelling any scenario.

ComReg's Issue Assessment

A 4.218 There are individual columns for "Three" and "O2" in 2016 in the worksheet "CalibChks" because some of the data was provided by Three in this way. It has no impact on the model.

A 4.219 The "Divide by zero" message appears in some cells in the worksheet "CalibChks" because some data has been deleted.

A 4.220 The graph in the worksheet "pA" is only intended to show the number of a chosen asset that is avoided over time. The model is set up to not consider the costs of the modelled network beyond 2045.

Issue raised – Correct modelling of roll-out of a mixed voice and data network

A 4.221 Vodafone said (in paragraph 29 of its Submission) that there had been inadequate time in the Consultation to model alternative routing factors in ComReg's new model to properly reflect the real drivers of network investment and that this additional work should be completed before a decision is made on the model outcome.

ComReg's Issue Assessment

A 4.222 ComReg considers that it is not clear if Vodafone wants more time to study this, or if it is recommending that ComReg study alternatives. AM does not see a need to model other routing factors, as AM has used its standard routing factor table applied in a similar form in several other countries. ComReg considers that Vodafone has not provided any persuasive evidence from management and network planning reports which proves that voice and not data is the driver of network investment which it could have done over the Consultation period.

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Question 15 - Responses MTR Calculation Results (Sections 5.4.6 to 5.4.7 of Consultation)

A 4.223 In the Consultation ComReg detailed the main changes to the MTR Consultation Model since the 2016 MTR model (section 5.4.6). ComReg then presented the preliminary MTR calculation results (section 5.4.7).

A 4.224 ComReg asked the following question:

Q. 15 Do you agree with ComReg's preliminary views regarding the maximum regulated MTR that MSPs with SMP should charge for the forthcoming price control period? 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.

A 4.225 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.226 Eircom said that the basic structure of the model was sound. It believed that the outputs would be reasonable once ComReg had taken account of the various issues that Eircom had raised in response to previous questions.

A 4.227 Vodafone said that it believed that ComReg should evaluate the proposed rates for the reasons that Vodafone had outlined in response to previous questions.

Issues raised regarding implementation of maximum MTRs

A 4.228 Issues were raised regarding the following:

- Use of a glide path; and
- Re-evaluation of the proposed rates.

Issue raised – Use of a glide path

A 4.229 Eircom said (in paragraph 50 of its Submission) that the Consultation proposed sharp drops in MTRs at the end of 2018 and that in order to avoid the possibility of instability and significant market disruption it believed that ComReg should move MTRs to its desired end point at the end of the control period by means of a glide path.

ComReg's Issue Assessment

A 4.230 Due to the planned implementation of Eurorate Termination Rates in 2021 ComReg, for the reasons given in paragraph 2.22, considers that there is merit in using a glide path to implement the modelled outputs from the BU LRIC models. ComReg has therefore decided to implement a glide path approach to the implementation of the maximum MTRs as discussed in the Executive Summary and in Chapter 5.

Issue raised – Re-evaluation of the proposed rates

A 4.231 Vodafone said (in paragraph 30 of its Submission) that a more conservative approach may be in the best interests of industry and ComReg as it encourages investment strategies of MSPs, allows for a degree of uncertainty created by Brexit, protects consumers and minimizes the risks associated with basing rates on the exact outcome of a very complex model and process.

ComReg's Issue Assessment

A 4.232 As previously discussed in the Executive Summary and Chapter 5 ComReg has decided to implement the maximum MTRs using a glide path approach.

A 4.233 ComReg agrees with the assessment by AM of Vodafone's contention that the proposals on MTRs create a disincentive to further investment. AM says in its AM Decision Pricing Report, Section A.1, that given widespread expectations of MTR declines, there should be no material impact on investment incentives with the proposed MTRs as they are following an expected path (of continued declines) and are not critical to an investor's overall investment decision.

A 4.234 The benefits are detailed in paragraphs A 4.77 to A 4.85. This includes consumer and social welfare benefits. ComReg considers that the conclusions of the reports regarding benefits i.e. the 2016 Assessment of the Termination Rates Recommendation, the 2016 Report on Changes in the Mobile Market in Ireland, and the other reports cited by AM, see paragraphs A 4.81 to A 4.82 help solidify the arguments for basing regulated maximum MTRs on BU pure LRIC.

Question 16 Responses - Any other issues raised in the Consultation (Section 5.4.7)

A 4.235 In the Consultation ComReg posed questions on a range of issues. In order to allow responders to raise issues not covered in the previous questions ComReg asked the following question:

Q. 16 Is there any other issue raised in this Consultation for which you would like to provide a response? Please provide reasons for your response, clearly indicating the relevant paragraph numbers to which your comments refer, along with relevant factual evidence to support your opinion/position.

A 4.236 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.237 Eircom raised issues regarding the treatment of common costs and the implementation date of the FTR Decision. Vodafone had no further comments to make.

A 4.238 While not in direct response to this question, Eircom identified that the Fixed Access and Call Origination/FACO and Retail Line Rental markets are due a review and should be progressed by ComReg in tandem. As regards the FACO market, Eircom stated that it should be de-regulated so as to put it on an even footing with others in terms of flexibility for cost recovery. ComReg has responding to Eircom's concerns in its Market Review Decision (see paragraph A11.70 – A11.73).

A 4.239 Tesco while not responding directly to Q16 (in paragraph 3, page 1 of its submission) expressed disappointment that the opportunity to stimulate competition by means of MVNOs will be lost if the Consultation position is implemented unchanged. The position and value of MVNOs have been discussed in paragraphs A 4.21 to A 4.25 above.

Other issues raised

A 4.240 Issues were raised regarding the following:

- Treatment of common costs; and
- Effective date for FTRs under this Decision.

Issue raised – Treatment of common costs

A 4.241 This issue has already been covered in the response to question 2, see paragraphs A 4.87 to A 4.103 above.

Issue raised – Effective date of FTR Decision

A 4.242 Eircom said (in paragraph 52 of its Submission) that in the interests of consistency, Eircom believes that the revised FTRs pursuant to this Decision should come into effect on the same date as the revised MTRs.

ComReg's Issue Assessment

A 4.243 ComReg agrees that for consistency the revised maximum FTRs pursuant to this Decision should come into effect on the same date as the revised maximum MTRs.

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Question 17 - Responses Further comments on the Market Review Consultation (Section 5.4.7)

A 4.244 The Consultation was issued after the Market Review Consultation.

A 4.245 ComReg asked the following question:

Q.17 Having considered this Consultation are there any further comments you would like to make on the proposed decision to impose a price control of cost orientation in the associated Market Review Consultation? If so can you please refer in your comments to the relevant paragraphs in that decision and support any comments with economics based argumentation and facts. Please note that the text of the draft decision instruments at Annexes 1 and 2 of this document may be subject to change to reflect any final decision taken in regard to the decision instruments proposed in the Market Review Consultation.

A 4.246 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.247 Eircom had nothing further to add in response to this question. Vodafone had no further comments to make.

A 4.248 Eircom, Tesco Mobile and Verizon made a number of comments in their submission but not directly in response to Q17. Eircom (in paragraph 6, page 4 of its Submission) and Verizon (at page 2 of its Submission and attached reports) commented on the treatment of calls originated within and outside the European Economic Area (EEA). Tesco Mobile (in paragraph 2, page 3 of its Submission) commented on the EU Roaming Regulation, the lack of response to its issues raised in response to the Market Review Consultation (see paragraph 4, page 1 of its Submission), the designation of Tesco Mobile and other MVNOs as “dominant in the market” (see paragraph 4, page 3 of its Submission) and the need for ComReg to consider a more targeted approach to intervention to create conditions for investment (see paragraph 3, page 3 of its Submission).

A 4.249 Such topics are outside the scope of this Decision but have however been discussed and considered in the Market Review Decision.

Question 18 Responses - Regulatory Impact Assessment (Chapter 6 of Consultation)

A 4.251 In the Consultation ComReg presented the results of its Regulatory Impact Assessment.

A 4.252 ComReg asked the following question:

Q. 18 Do you have any views on the Regulatory Impact Assessment? Are there other factors that ComReg should consider in completing its Regulatory Impact Assessment? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all facts or argumentation supporting your position.

A 4.253 ComReg received two direct replies to the question:

Eircom	Tesco Mobile	Verizon	Vodafone
✓			✓

A 4.254 Eircom raised various issues saying that the RIA was deficient in a number of areas. While Vodafone stated that it had no further comment to make in response to this question it stated elsewhere (in paragraph IV, page iii of its Submission) that ComReg had not carried out an analysis that the impact of the very significant proposed changes in the MTR LRIC rate will have on the market, sustainable competition, and on consumer benefits. Tesco Mobile did not specifically respond to question 18. ComReg has taken some of the issues raised by Tesco Mobile and replied to them as part of this section.

Issues raised regarding the Regulatory Impact Assessment question

A 4.255 Issues were raised regarding the following:

- Qualitative nature of the RIA;
- Speculative nature of the RIA, rooted in conjecture;
- Consideration of how fixed and common costs are recovered; and
- Challenges faced by MVNOs.

Issue raised – Qualitative nature of the RIA

A 4.256 Eircom said (in paragraph 55 of its Submission) that the approach adopted by ComReg is wrong because the RIA is little more than a qualitative discussion that is subjective and cursory in nature. Eircom also said in paragraph 57 that no attempt has been made to quantifiably assess the efficiency or cost of ComReg's proposals.

ComReg's Issue Assessment

A 4.257 ComReg considers that it has carried out a RIA that is neither subjective nor cursory. ComReg engaged regulatory experts AM who carried out a full analysis of the economic reasons for imposing price regulation on termination rates. In response to Vodafone's comment (see paragraph A 4.254 above) ComReg also carried out a detailed analysis of the likely impacts on stakeholders and on competition in the RIA.

A 4.258 Eircom is incorrect when it says that ComReg did not quantifiably assess the efficiency or cost of its proposals. ComReg assessed the cost difference between using termination rates based on LRIC as opposed to LRAIC+.

Issue raised – Speculative nature of the RIA, rooted in conjecture

A 4.259 Eircom (in paragraph 56 of its Submission) gave various examples which it said showed how the RIA was speculative in nature and rooted in conjecture.

ComReg's Issue Assessment

A 4.260 ComReg cannot predict with absolute certainty all the effects of lower MTRs. However, using reasoning and results already obtained, it has to consider the likely impacts of lower MTRs in a regulatory impact assessment. A study¹⁵ by TERA for the European Commission has shown that *'.....the resulting level playing field and lower wholesale rates in the termination markets have in addition contributed to a decrease in retail prices, an increase in traffic volumes and the launch of new offers.'*

¹⁵ <https://ec.europa.eu/digital-single-market/en/news/termination-rates-recommendation-helps-achieve-lower-and-more-consistent-rates-new-study-shows>

Issue raised – Consideration of how fixed and common costs are recovered

A 4.261 This issue has already been covered in the response to question 2, see paragraphs A 4.87 to A 4.103 above.

Issue raised – Challenges faced by MVNOs

A 4.262 In its general Submission letter Tesco Mobile (at paragraph 4 and 5, Page 2 of its Submission) said that there are a number of material factors and challenges faced specifically by MVNOs that are not faced by MNOs. Tesco Mobile (at paragraph 1 and 2, page 4 of its Submission) also urged ComReg to give adequate consideration to the distinct challenges and issues facing MVNOs going forward, and to engage with these market players, actual and potential competitors, in order to develop a more robust and dynamic regulatory regime.

ComReg's Issue Assessment

A 4.263 The purpose of the Consultation was to consult on the proposed further specification of the price control obligations for fixed and mobile call termination for Service Providers provisionally found to have SMP in the FVCT and MVCT markets respectively. Tesco Mobile raised issues that were outside the scope of the Consultation – issues relevant to the Market Review Consultation have been dealt with in the Market Review Decision. As regards the further specification of the price control obligations, ComReg has not received any evidence from MVNOs which demonstrates that an MVNO's cost of MVCT is materially different from the LRAIC+ and pure LRIC that has been calculated by the MTR Decision Model. As AM point out in the AM Decision Pricing Report (Section A.9,) both BEREC and the European Commission have concluded in other Member States that full MVNOs can benefit from the same economies of scale/scope as their host and hence can achieve the same unit costs of termination. Examples of such Member States include Italy¹⁶ and France¹⁷.

¹⁶ See https://circabc.europa.eu/sd/a/59fcfcad-2ae3-42eb-a8b3-7b1c5250ad4b/IT-2016-1885%20Recommendation_adopted_publication_EN.pdf, page 6 (for the European Commission response) and https://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/6182-berec-opinion-on-phase-ii-investigation-_0.pdf, pages 9 and 10 (for the BEREC response).

¹⁷ See <https://circabc.europa.eu/d/d/workspace/SpacesStore/001eb961-c5c4-49d9-bb04-74af823e4bc4/FR-2012-1304%20withdrawal%20letter-non-confidential-EN.pdf>, page 8.

Annex: 5 Consideration of EC Comments

- A 5.1 Annex 6 contains a copy of the EC response to ComReg's notified draft measures for fixed and mobile call termination markets, EC case IE/2019/2150, wholesale call termination on individual public telephone markets provided at a fixed location in Ireland, and case IE/2019/2151, wholesale voice call termination on individual mobile networks in Ireland (the '**Comments Letter**').
- A 5.2 The EC commented on the efficient level of termination rates, see section 3.1 of the Comments Letter, and on delays in the market review of the fixed termination markets, see section 3.2 of the Comments Letter. The consideration of the latter comment is dealt with in Annex 3 to the Market Review Decision.
- A 5.3 The comment from the EC on the efficient level of termination rates was as follows:

The Commission takes note of ComReg's proposal to set fixed and mobile termination rates based on a four-year glide-path, despite having updated its pure BU-LRIC models for calculating fixed and mobile termination rates in order to determine the efficient symmetric termination rates for the years 2019-2022.

The Commission further takes note of the fact that the Irish fixed and mobile termination rates are already below the average of the pure BU-LRIC termination rates as calculated by NRAs in the EU. The glide-path proposed by ComReg will lower FTRs and MTRs even further.

In addition, the Commission acknowledges the justifications given for ComReg's approach and its aim of reducing market disruptions and instability which could be caused by sudden significant reductions in the level of termination rates (from 0.79 to 0.33 EUR cent/min in 2019 for MTRs). It also acknowledges that, in the run-up to the introduction of the Eurorates in 2021, ComReg wishes to mitigate the risk of instability caused by termination rates potentially being lowered and later increased when the Eurorates enter into force.

The Commission also acknowledges that, in the past, whenever an NRA proposed to set termination rates at levels that did not reflect recent market conditions, the Commission expressed serious doubts as to the compliance of such measures with the EU Regulatory Framework.

However, considering the proposed levels of the Irish fixed and mobile termination rates and that the current measure would apply only in the interim period before the Eurorates enter into force, the Commission distinguishes this case from its previous practice. In fact, contrary to the situation underlying case RO/2017/2017-2018, the rates that ComReg proposes to apply are low compared to the EU average. Therefore, setting termination rates at the levels proposed by ComReg would not have a negative effect. Based on this, the Irish draft notified measures do not raise the same serious concerns for the Commission.

- A 5.4 The EC has thus concluded that the levels of the rates proposed by ComReg would not have a negative effect and do not raise the same serious concerns for the Commission as certain previous submissions by other NRAs. ComReg has therefore, on the basis of the reasoning set out in this Decision (see in particular paragraph 2.22) and taking into account the comments from the EC, decided to set maximum regulated fixed and mobile termination rates at the levels as notified to the EC.

Annex: 6 EC Response to ComReg's Notified Draft Measures

- A 6.1 This Annex contains a copy of the letter from the EC to ComReg dated 10 April 2019.
- A 6.2 ComReg's consideration of the comment received from the European Commission in relation to efficient level of termination rates is set out in Annex 5.
- A 6.3 ComReg's consideration of the comment received in relation to delays in the market review of the fixed termination markets is dealt with in Annex 3 to the Market Review Decision.

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EUROPEAN COMMISSION

Brussels, 10.4.2019
C(2019) 2908 final

Commission for Communications
(ComReg)
One Dockland Central, Guild Street
D01 E4X0 Dublin 1
Ireland

For the attention of:
Mr Garrett Blaney
Chairperson of the Commission

Fax: +35318788193

Dear Mr Blaney,

Subject: Commission Decision concerning case IE/2019/2150: Wholesale call termination on individual public telephone networks provided at a fixed location in Ireland, and

Case IE/2019/2151: Wholesale voice call termination on individual mobile networks in Ireland

Comments pursuant to Article 7(3) of Directive 2002/21/EC

1. PROCEDURE

On 11 March 2019, the Commission registered two notifications from the Irish national regulatory authority, the Commission for Communications (ComReg)¹, concerning the markets for wholesale call termination on individual public telephone networks provided at a fixed location and wholesale voice call termination on individual mobile networks² in Ireland.

¹ Under 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.

² Corresponding to markets 1 and 2 in Commission Recommendation 2014/710/EU of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (Recommendation on Relevant Markets), OJ L 295, 11.10.2014, p. 79.

The national consultation³ ran from 2 October 2017 to 10 January 2018 for the fixed and mobile termination market analysis decision and from 13 March 2018 to 2 May 2018 for the decision specifying the price control remedies for both markets.

On 19 March 2019, a request for information⁴ was sent to ComReg and a response was received on 22 March 2019. A supplementary request for information was sent to ComReg on 21 March 2019 and a response was received on 25 March 2019.

Under Article 7(3) of the Framework Directive, national regulatory authorities (NRAs), the Body of European Regulators for Electronic Communications (BEREC) and the Commission may make comments on notified draft measures to the NRA concerned.

2. DESCRIPTION OF THE DRAFT MEASURE

2.1. Background

Fixed termination

The review of the market for call termination on individual public telephone networks provided at a fixed location in Ireland was previously notified to and assessed by the Commission under cases IE/2007/0701⁵ and IE/2013/1469⁶.

In the 2007 market review, ComReg defined seven relevant markets and stated that all fixed telecommunication operators providing call termination services had significant market power (SMP) in their respective networks⁷. ComReg proposed to impose on Eircom the obligations of access, transparency, non-discrimination, accounting separation, cost orientation and cost accounting. Alternative operators (ANOs) were made subject to transparency, non-discrimination and price control obligations⁸. The specific obligation imposed on Eircom was to ensure that fixed termination rates (FTRs) were calculated using a forward-looking, long-run incremental costs (FL-LRIC) model. ANOs designated as having significant market power were exempt from cost orientation until they reached a 5 % share of total direct access paths. If the ANO did not reach the 5 % share of the market within five years, ComReg would impose a price control regulation on them.

³ In accordance with Article 6 of the Framework Directive.

⁴ In accordance with Article 5(2) of the Framework Directive.

⁵ SG-Greffe (2007) D/207013.

⁶ C(2013) 4628.

⁷ These operators were: Eircom, BT Ireland, Colt Telecom, Magnet Communications, Ntl Ireland and Chorus (merged under UPC heading and then rebranded Virgin Media), Smart Telecom (now Viatel) and Verizon.

⁸ ComReg considered that imposing the access obligation on ANOs would be disproportionate because it was in the commercial interests of ANOs to interconnect with Eircom and with other ANOs, and therefore it was highly unlikely for them to have an incentive not to interconnect. ComReg also explained that an ANO's failure to provide interconnection could be the subject of a dispute notification submitted to ComReg. It also considered that failure to provide a new entrant access to markets where access was already being provided to other operators could constitute a breach of the ANO's non-discrimination obligation and ComReg could intervene in a timely fashion to remedy non-compliance.

In its comments on the 2007 market review, the Commission considered ComReg’s approach to alternative operators as inconsistent with EU practice and invited ComReg to revisit its market analysis. The Commission also invited ComReg to align its forthcoming review with the Commission’s Termination Rates Recommendation and set FTRs for all SMP operators at the level of costs incurred by an efficient operator to achieve symmetric price control remedies on the relevant market. Finally, the Commission underlined the need for a coherent EU approach to using the cost accounting method.

In case IE/2012/1372⁹, ComReg proposed to impose on all SMP operators a cost-orientation obligation based on a pure bottom-up long-run incremental cost (BU-LRIC) methodology, and to set a glide-path¹⁰ (2012 Pricing Decision).

The Commission asked ComReg to review its proposed glide-path for fixed termination rates and called upon ComReg to implement the target FTR levels by the deadline set in the Termination Rates Recommendation. However, the Commission considered that a short delay in implementing the cost-oriented fixed termination rates could exceptionally be acceptable in this case.

ComReg notified the Commission of a new market analysis under case IE/2013/1469. However, ComReg never adopted the final decision due to an appeal against similar provisions in its mobile termination decision (2012)¹¹. Therefore, the fixed voice call termination markets remained regulated under the 2007 Decision. In addition to the 2012 Pricing Decision, ComReg introduced amendments to remedies that were notified to the Commission under cases IE/2009/0917¹² and IE/2011/1220¹³.

In particular, in case IE/2011/1220, ComReg proposed to: (i) supplement the existing price control obligation by a margin squeeze test between the price of the components of the wholesale switchless voice service¹⁴ and the pricing of the corresponding wholesale call origination and call termination products for interconnected alternative operators, and (ii) further specify the details of the

⁹ C(2012) 8381.

¹⁰ The proposed BU-LRIC based FTRs are set out in the table below:

BU-LRIC FTR		
Start date	Blended rate (EURcent per minute)	Efficient network technology
1 July 2013	0.098	TDM
1 July 2014	0.085	TDM/NGN
1 July 2015	0.072	NGN

¹¹ In its reply to a Commission request for information, ComReg explained that this appeal was not resolved until February 2016 and so ComReg did not introduce measures related to fixed voice call termination markets during this period. In the second half of 2016, ComReg commenced the review that ultimately has resulted in the current market analysis notification. As that review had already commenced, ComReg did not explore the possibility of addressing the high FTRs through any different procedure.

¹² C(2009) 4570.

¹³ C(2011) 4377.

¹⁴ Eircom offers a wholesale switchless voice service which allows service providers to provide retail voice services at a fixed location without the need to invest in their own interconnection infrastructure. This service, known as ‘white label’ voice, allows fixed operators to purchase end-to-end wholesale voice services. Eircom terminates these calls on behalf of those operators who purchase white label voice on Eircom’s network.

transparency obligation. On the margin squeeze test, the Commission commented that ComReg should ensure that its proposed measures did not lead to different regulated prices for the same wholesale products depending on whether they are sold independently or in a bundle. The Commission also urged ComReg to align its model with the Commission's Termination Rates Recommendation.

Mobile termination

The second review of the market for mobile voice call termination was notified to and assessed by the Commission under case IE/2012/1371¹⁵. ComReg designated six mobile operators as having SMP¹⁶ and imposed the following obligations on all of them: access, non-discrimination, transparency, and price control. Moreover, ComReg chose a pure BU-LRIC methodology as the most appropriate price control remedy for setting mobile termination rates (MTRs) in Ireland¹⁷. For the period from 1 July 2013 until the adoption of a pure BU-LRIC model (expected at the time by 1 July 2014 at the latest), ComReg had proposed to set MTRs in Ireland on the basis of a benchmarking method based on those countries that had at that time notified the Commission of using pure BU-LRIC models under Article 7 of the Framework Directive¹⁸. The resulting pure BU-LRIC benchmark to be achieved as of 1 July 2013 was 1.02 EURcents/min¹⁹. The Commission called upon ComReg to implement the target benchmarked MTR already by 31 December 2012, and commented that the benchmark should be based on the rates that are set by the NRAs by way of final decisions in the respective Member States, instead of notified rates as proposed by ComReg.

Both decisions (cases IE/2012/1371 and IE/2012/1373) were appealed to the High Court. Following the High Court's judgment of July 2013, a Court's Order²⁰ was issued in October 2013 imposing an interim maximum MTR of EURcents/min 2.60 applicable as of 1 July 2013. This rate corresponded to the MTR in place at the time of the Order.

In July 2015, ComReg notified the Commission of a proposed two-year extension of the period for conducting a new analysis of the markets for voice call termination on individual mobile networks in Ireland, pursuant to Article 16(6)(a) of the Framework Directive. The Commission did not object to the requested extension.

¹⁵ C(2012) 8381.

¹⁶ Hutchison 3G Ireland Limited (H3G), Lycamobile Ireland Limited (Lycamobile), Meteor Mobile Communications Limited (Meteor), Tesco Mobile Ireland Limited (TMI), Vodafone Ireland Limited (Vodafone) and Telefónica Ireland Limited (O2).

¹⁷ Case IE/2012/1373, C(2012) 8381.

¹⁸ UK, Belgium, Portugal, Spain, France, Denmark and Italy.

¹⁹ The intermediate rates proposed for the periods July 2012-January 2013 and January 2013-July 2013 were 4.15 EURcents/min and 2.58 EURcents/min, respectively.

²⁰ In its judgment of 14 August 2013, the High Court ruled in part against ComReg, namely in relation to the benchmarking. However, it deferred its ruling on Vodafone's challenge to the legality of ComReg's choice of pure LRIC as the relevant cost standard pending the adoption of the model. The court's order was made on 11 October 2013 (and perfected on 17 October 2013) and a further statement of reasons for the judgment was provided by the High Court on 21 November 2013.

In case IE/2015/1812²¹, ComReg specified the price control and transparency obligations previously imposed on the operators identified as having SMP. In particular, ComReg developed a new cost model and imposed new pure BU-LRIC rates²². The Commission did not have any comments.

2.2. Market definition

Fixed termination

ComReg defines the relevant fixed termination markets as including the provision by a fixed service provider of a wholesale fixed voice call termination service to other service providers from the nearest point to the end-user or level on that terminating fixed operator's network at which incoming voice calls can be handed over for termination to fixed numbers, and for which that fixed operator is able to set the FTR²³. ComReg includes in the market the provision of fixed termination services to all geographic numbers, as well as to nomadic 076 numbers and to emergency 112/999 numbers, which share sufficiently similar competitive conditions as termination for geographic numbers. ComReg considers that termination services provided to geographic numbers in the fixed networks numbering range, using mobile technology should also be included in the product market definition, as these services share similar functionality characteristics (limited mobility) and similar pricing structures as voice call services delivered via narrowband technology to end users at a fixed location. ComReg excludes self-supply from the relevant product market, as self-supply is unlikely to constrain rate-setting behaviour in supplying termination to other service providers.

The geographic scope of the relevant market is national and corresponds to the geographic coverage of each individual fixed network.

Accordingly, ComReg identifies 22 separate national fixed termination markets²⁴.

Mobile termination

ComReg defines mobile termination markets as including the provision by a mobile service provider of a wholesale mobile voice call termination service to other service providers for the purpose of terminating incoming voice calls to mobile numbers, and for which that mobile service provider is able to set the MTR. ComReg considers that calls made on managed, partially-managed or unmanaged

²¹ C(2015) 9591.

²² The symmetrically applicable MTR caps are as follows: 0.84 EURcents/min for 2016; 0.82 EURcents/min for 2017; and 0.79 EURcents/min for 2018.

²³ For this, ComReg also includes in the relevant product market definition calls to fixed numbers using managed or partially-managed VoIP technology, as well as termination services provided for calls to fixed numbers using unmanaged VoIP technologies where either the unmanaged VoIP service provider or a host service provider has the ability to set the level of the FTR.

²⁴ Airspeed Communications, BT Communications, Blueface, Colt Technology, Dialoga Servicios, Eircom, Equant, Finarea, Imagine, In2com, Intellicom, IP Telecom, Magnet Networks, Magrathea, Modeva Networks, PlanNet 21 Communications, Telcom, Verizon, Viatel, Virgin Media, Vodafone, and Voxbone. Until now, 15 of these operators have been providing fixed termination services charging unregulated rates. In its reply to the second Commission request for information, ComReg explains that the fixed operators designated as having SMP account for approximately over 90 % of all sales of fixed voice call termination, with the remainder accounted for by the newly designated SMP fixed operators with very limited market share.

voice-over-IP (VoIP) services fall outside the relevant market as no mobile termination service is required and no MTR is levied.

The geographic scope of the relevant market is national and corresponds to the geographic coverage of each individual mobile service provider's network.

Accordingly, ComReg identifies six separate national mobile termination markets²⁵.

2.3. Finding of significant market power

Fixed termination

ComReg proposes to designate 22 SMP operators based on the following main criteria: (i) market share, (ii) control of infrastructure not easily duplicated and subject to significant barriers to entry, (iii) absence of potential competition, and (iv) absence of, or low, countervailing buying power. Historical and likely pricing behaviour are also taken into account.

ComReg intends to ascertain within six months from the adoption of the final decision whether the additional fixed termination providers (Phone Pulse, Goldfish and Nuacom) are operating within a relevant fixed voice termination market, whether they have SMP and, if so, whether they should have regulatory obligations imposed upon them.

Mobile termination

ComReg proposes to designate six SMP operators based on the following main criteria: (i) market shares, (ii) control of infrastructure not easily duplicated and subject to significant barriers to entry, (iii) absence of potential competition, and (iv) absence of, or low, countervailing buying power. Historical and likely pricing behaviour are also taken into account.

2.4. Regulatory remedies

Fixed termination

ComReg proposes to impose on all 22 SMP operators (including Eircom) the following obligations: (i) access, (ii) non-discrimination, (iii), transparency, including the requirement to publish a reference offer, and (iv) price control. In addition, ComReg proposes to impose additional transparency²⁶ and access obligations²⁷ only on Eircom. It also proposes to lift the obligations of cost accounting and accounting separation currently imposed on Eircom.

²⁵ Meteor (trading as eir Mobile, a business name of Eircom), Lycamobile, Tesco Mobile Ireland (TMI), Three, Virgin Media and Vodafone.

²⁶ ComReg requires Eircom to publish detailed documentation on all terms (other than price), conditions, SLAs, guarantees and other product-related assurances associated with the provision of fixed termination within its wholesale switchless voice services. In its reply to the Commission request for information, ComReg clarified that the fixed voice call termination component of the margin squeeze test notified in case IE/2011/1220 is to be withdrawn and replaced by these transparency obligations.

²⁷ ComReg requires Eircom to provide access to interconnection services as an associated facility given its ubiquitous network coverage and network hierarchy. ComReg's concern is that Eircom could impede/raise the costs of effective handover of calls for termination to fixed numbers on its network. Therefore, there would be a

Regarding the price control obligation, ComReg developed a cost model to calculate pure LRIC fixed termination rates on the basis of hypothetical efficient established operators (FTR Model). The FTR Model calculated costs of fixed termination on an annual basis over a multi-year period. The model calculated rates: (i) on a call set up fee and per minute call duration rate basis (two-part charge)²⁸, and (ii) on a pure per minute basis (one-part charge)²⁹. However, ComReg proposes to implement FTRs using a glide-path based on the consideration that EU-wide fixed termination rates (Eurorates) will enter into force as of 2021 as the European Commission is currently working on the adoption of a delegated act pursuant to the recently adopted European Electronic Communications Code (EECC)³⁰. The glide-path, as per the table below, would reduce the possibility of FTRs being lowered under the current national decision and then raised by operators when the Eurorates come into effect, and would be applicable until the Eurorates enter in force.

FTRs	Current rates	2019	2020	2021	2022
Two-part charge: call set-up fee (EURcent)	0.060	0.061	0.061	0.062	0.062
Two-part charge: per minute fee (EURcent)	0.049	0.043	0.037	0.030	0.024
One part charge: per minute fee (EURcent)	0.072	0.063	0.057	0.051	0.045

Table 1: Fixed termination rates based on glide-path

need to ensure that alternative operators can reach all points on the Eircom network to which they need to interconnect. Eircom is also required to conclude, maintain and update as appropriate, legally binding SLAs for the provision of interconnection services.

²⁸ A very high percentage of minutes of traffic are billed on a 'cost per minute and a cost per call' basis. ComReg explains that the one-part charging fee is derived from the two-part charges on the basis that the average call duration of terminated fixed calls is 2.98 minutes. This is done using the following equation: 'One-part charge per minute rate = Call set-up fee/average call duration + pure per minute rate'.

²⁹ The results of the FTR cost model are shown below:

FTRs	Current rates	2019	2020	2021	2022
Two-part charge: call set-up fee (EURcent)	0.060	0.071	0.068	0.065	0.062
Two-part charge: per minute fee (EURcent)	0.049	0.025	0.025	0.028	0.024
One part charge: per minute fee (EURcent)	0.072	0.049	0.047	0.050	0.045

³⁰ Article 75 of the European Electronic Communications Code provides that the Commission will adopt a delegated act setting a single maximum EU-wide mobile voice termination rate and a single maximum EU-wide fixed voice termination rate (together referred to as 'the EU-wide voice termination rates'), applicable as of 31 December 2020.

Mobile termination

ComReg proposes to impose on all six SMP operators the following obligations: (i) access, (ii) transparency, (iii) non-discrimination, and (iv) price control. ComReg proposes to remove the cost accounting and accounting separation obligations.

Regarding the price control obligation, ComReg developed a cost model to calculate pure LRIC mobile termination rates on the basis of hypothetical efficient established operators (MTR Model). The MTR Model calculated costs of mobile termination on an annual basis over a multi-year period³¹. ComReg noted that if the maximum regulated MTRs were applied at the level of the modelled costs, Irish MTRs would be the lowest in the EU (0.33 EURcent/min in 2019). ComReg considers that such a steep decrease (from 0.79 EURcent/min to 0.33 EURcent/min) could be very disruptive and potentially introduce instability in the market. Therefore, also in order to reduce the possibility of MTRs being lowered and then potentially raised again by operators when the Eurorates come into effect, ComReg proposes to implement MTRs using a glide-path, as per the table below.

Year	Current rates	2019	2020	2021	2022
MTR (EURcent/min)	0.79	0.67	0.55	0.43	0.31

Table 2: Mobile termination rates based on glide-path

Treatment of non-EEA originated calls

ComReg proposes to allow designated SMP operators to differentiate between EEA and non-EEA originated calls. However, in order to avoid negative consequences for non-EEA operators, ComReg proposes that any flexibility afforded to termination rates charged for non-EEA originated traffic be limited to those instances where the termination rates of non-EEA operators are 'unreasonably high'. Termination rates are considered to be unreasonably high when they are above the highest EEA pure BU-LRIC termination rate. In particular, the notified measure provides for the following:

(i) SMP operators must charge the prevailing Irish regulated termination rate when terminating traffic originated by non-EEA operators who charge termination rates that do not exceed the highest EEA pure BU-LRIC termination rate.

(ii) If non-EEA operators charge termination rates above the highest EEA pure BU-LRIC termination rates, SMP operators may charge FTRs above the Irish regulated termination rate. In this case, the termination rate charged shall be no higher than the prevailing Irish regulated termination rates plus the difference between the rate charged by the non-EEA operator and the highest EEA pure BU-LRIC rate.

³¹ The results of the MTR cost model are shown in the table below:

Year	Current rates	2019	2020	2021	2022
Modelled cost per minute (EURcent)	0.79	0.33	0.32	0.31	0.31

3. COMMENTS

The Commission has examined the notification and the additional information provided by the ComReg and has the following comments³²:

3.1 Efficient level of termination rates

The Commission takes note of ComReg's proposal to set fixed and mobile termination rates based on a four-year glide-path, despite having updated its pure BU-LRIC models for calculating fixed and mobile termination rates in order to determine the efficient symmetric termination rates for the years 2019-2022.

The Commission further takes note of the fact that the Irish fixed and mobile termination rates are already below the average of the pure BU-LRIC termination rates as calculated by NRAs in the EU³³. The glide-path proposed by ComReg will lower FTRs and MTRs even further.

In addition, the Commission acknowledges the justifications given for ComReg's approach and its aim of reducing market disruptions and instability which could be caused by sudden significant reductions in the level of termination rates (from 0.79 to 0.33 EURcent/min in 2019 for MTRs). It also acknowledges that, in the run-up to the introduction of the Eurorates in 2021, ComReg wishes to mitigate the risk of instability caused by termination rates potentially being lowered and later increased when the Eurorates enter into force.

The Commission also acknowledges that, in the past, whenever an NRA proposed to set termination rates at levels that did not reflect recent market conditions, the Commission expressed serious doubts as to the compliance of such measures with the EU Regulatory Framework.

However, considering the proposed levels of the Irish fixed and mobile termination rates and that the current measure would apply only in the interim period before the Eurorates enter into force, the Commission distinguishes this case from its previous practice. In fact, contrary to the situation underlying case RO/2017/2017-2018, the rates that ComReg proposes to apply are low compared to the EU average³⁴. Therefore, setting termination rates at the levels proposed by ComReg would not have a negative effect. Based on this, the Irish draft notified measures do not raise the same serious concerns for the Commission.

3.2 Delays in the market review of the fixed termination markets

The Commission notes that the last market review of the fixed voice call termination markets dates back to 2007. The Commission acknowledges that ComReg conducted a market review of these markets in 2012, but that the measure notified to the Commission in July 2013 was ultimately not adopted. The Commission also acknowledges that ComReg will adopt the notified draft measures as soon as possible and that it will conduct a new market analysis to assess whether

³² In accordance with Article 7(3) of the Framework Directive.

³³ BEREC Report on termination rates (July 2018).

³⁴ In the Romanian case, the level of termination rates was above the average pure BU-LRIC MTRs in the EU.

three additional fixed operators should be designated as SMP operators, as confirmed by ComReg in its reply to the request for information.

Timely market reviews are of utmost importance to ensure appropriate regulatory measures and market predictability. Therefore, the Commission calls on ComReg to ensure that all operators active on fixed termination markets are adequately regulated in a timely manner.

Pursuant to Article 7(7) of the Framework Directive, ComReg shall take the utmost account of the comments of other NRAs, BEREC and the Commission and may adopt the resulting draft measure; where it does so, shall communicate it to the Commission.

The Commission's position on this particular notification is without prejudice to any position it may take *vis-à-vis* other notified draft measures.

Pursuant to Point 15 of Recommendation 2008/850/EC³⁵ the Commission will publish this document on its website. The Commission does not consider the information contained in this letter to be confidential. You are invited to inform the Commission³⁶ within three working days following receipt whether you consider that, in accordance with EU and national rules on business confidentiality, this document contains confidential information which you wish to have deleted prior to such publication³⁷. Please give reasons for such a request.



Yours sincerely,

For the Commission,
Roberto Viola
Director-General

³⁵ Commission Recommendation 2008/850/EC of 15 October 2008 on notifications, time limits and consultations provided for in Article 7 of Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, OJ L 301, 12.11.2008, p. 23.

³⁶ Your request should be sent either by email: CNECT-ARTICLE7@ec.europa.eu or by fax: +32 2 298 87 82.

³⁷ The Commission may inform the public of the result of its assessment before the end of this three-day period.