Assessment of Eir's USO funding application – Direct net cost 2015-2016 - Non-Confidential

ComReg

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Contents

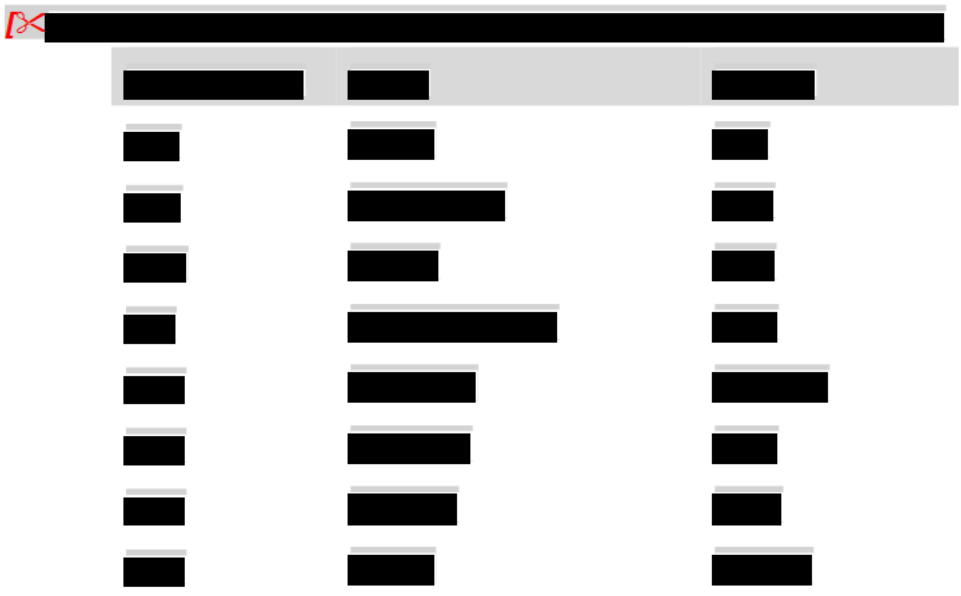
1 Abbreviations and Glossary

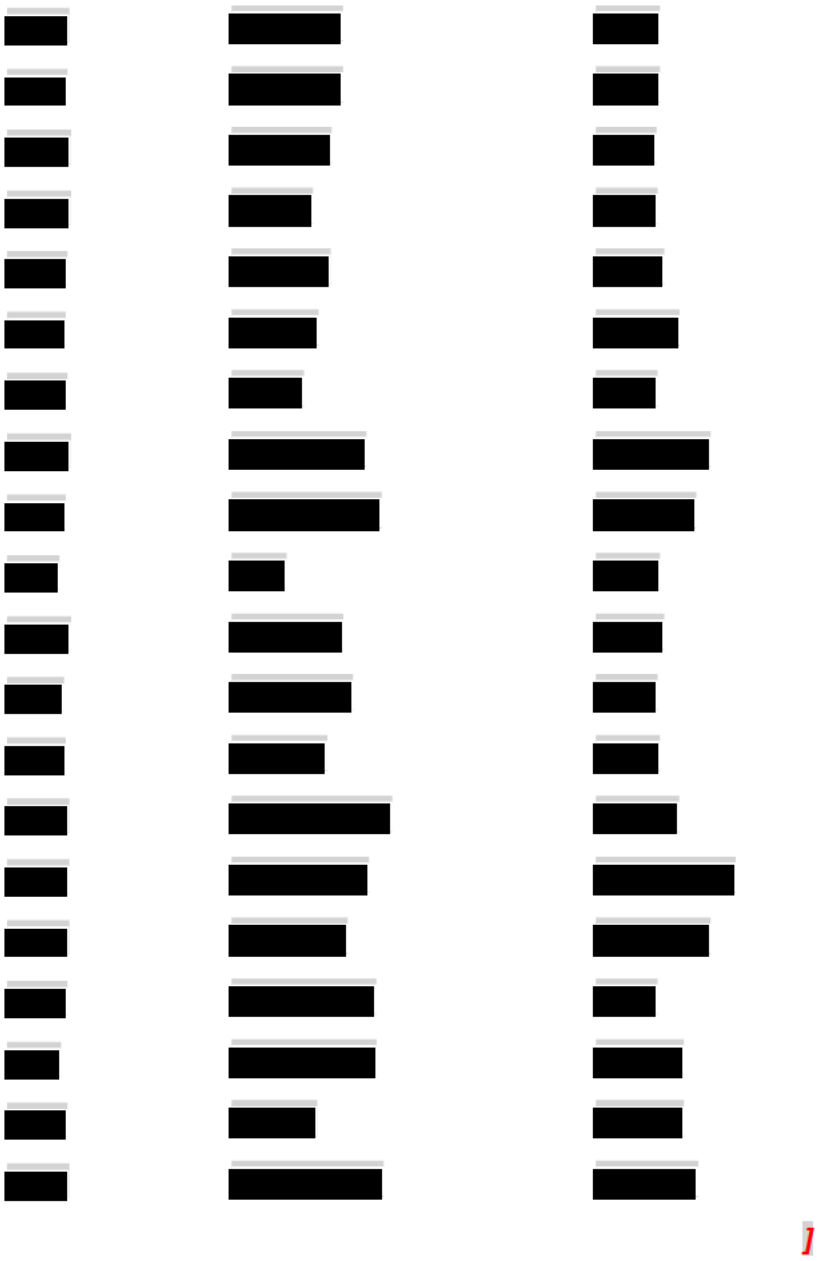
1.1 Abbreviations

BIP	Business IP
CAM	Copper Access Model
CAPEX	Capital Expenditure
CPE	Customer Premises Equipment
CPS	Carrier Pre-Selection
CVR	Cost-Volume Relationship
DSLAM	Digital Subscriber Line Access Multiplexer
DSL-B	Digital Subscriber Line-Bitstream
DSL-R	Digital Subscriber Line-Retail
FRA	Fractional Rate Access
FTTC	Fibre To The Cabinet
IP	Internet Protocol
IPC	Provisioning Control
ISDN	Integrated Services Digital Network
LFI	Line Fault Index
LLU	Local Loop Unbundling
MDF	Main Distribution Frame
NGN	Next Generation Network
OAO	Other Authorised Operators
OH	Overhead
OPEX	Operating Expenditure
POTS	Plain Old Telephone Service

PPC	Partial Private Circuits
PRA	Primary Rate Access
PSTN	Public Switched Telephone Network
RAT	Reasonable Access Threshold
SABB	Stand-Alone Broadband
SANS	Storage Area Network
SB-WLR	Single Billing - Wholesale Line Rental
STD	Subscriber Trunk Dialling
TD-LRIC	Top Down Long Run Incremental Cost
UAN	Universal Account Numbers
UG	Underground
ULMP	Unbundled Local Metallic Path
USO	Universal Service Obligations
USP	Universal Service Provider
WLR	Wholesale Line Rental
WSEA	Wholesale Symmetrical Ethernet Access

MDFs





1.2 Glossary of key terms (A to Z)[1]

"***calculated direct net cost***" means the final direct net cost figure that, in TERA's view and following TERA's assessment, should be allowed for the purposes of this application. The term may be used to describe either the calculated direct net cost for an individual USO model, or the total calculated direct net cost, as the context requires.

"***direct net cost"*** of USO is the difference between the avoidable costs attributable to the provision of the USO (both direct and indirect), minus revenues (both direct and indirect) attributable to the provision of the USO, before the deduction of intangible benefits which accrue to the USP by virtue of being the USP.

[1] Save where specified above, terms and abbreviations used by TERA in this report have the same meaning as those listed in the Glossary of D04/11.

"***2015/16 USO funding application***" is eir's USO funding application for the financial year 2015/16 submitted to ComReg in March 2017.

"***Frontier Report"*** means the report prepared by Frontier, "USO Model Documentation - 2015/16, A Report prepared for Eir, March 2017 outlining eir's calculations and methodology for the direct net cost for the financial year 2015/16.

"**MDF area**" means a geographic area as described by the Main Distribution Frame map.

"***net cost"*** is calculated as the difference between the 'direct net cost' and the intangible benefits which accrue to the USP, by virtue of being the USP.

"***USO Model***" refers to the USO direct net cost model underpinning eir's USO funding applications to ComReg as a whole, including all calculations, data, spreadsheets, the model summary and the individual net cost models (Area, Customer, Payphone, Directories, and Disabled Users). These individual direct net cost models may be referred to cumulatively as "USO Models".

"Preliminary ComReg methodology" refers to the preliminary methodology developed by TERA in March 2017 setting out the manner in which the 2016 CAM could be applied to the Customer Model of eir's 2015-2016 USO funding application[2].

"Proposed ComReg methodology" refers to the proposed methodology developed by TERA in December 2019 setting out the manner in which the 2016 CAM should be applied to the Customer Model of eir's 2015-2016 USO funding application[3]

[2] "Tutorial: Using the bottom-up model for the USO net cost estimation" January 2017 Ref: 2016-62-ML-ComReg– USO 2014-2016.

[3] Set out in ComReg letters to eir dated (1) 24th December 2019 (Annex 1) and (2) 1st May 2020 (Annex 1).

2 Executive summary

TERA Consultants ("TERA") were engaged by ComReg to undertake an assessment of the direct net cost element of Eircom Limited's ("eir's") USO funding application for the financial year 2015/16 and to assess its adherence with the direct net cost calculation principles and methodology set out in ComReg Decision D04/11[4].

2.1 Background

eir's application for USO funding for the financial year 2015/16 was submitted on 31 March 2017, including the USO Model and a report prepared by Frontier Economics ("Frontier") outlining eir's methodology and calculations for the direct net cost. This entire application is referred to as eir's ***"2015/16 USO funding application"***.

2.2 TERA's assessment

TERA has reviewed PWC's Agreed Upon Procedures ("AUP") Report[5], and all aspects of eir's 2015/16 USO funding application. This involved a detailed review by TERA of the data sources, methodology and calculations in eir's USO models. The details of TERA's assessment process are set out in chapter 3, Methodological Overview.

The direct net cost figures claimed by eir under each of the individual USO models are summarised in Table 1 below. eir has also claimed an amount for consultancy fees.

Table 1 2015/2016 - USO Direct Net Cost

Net cost component, €	2015/2016 eir application	2015/2016 Assessment as validated by TERA
Area Model	444 959	444 959
Customer Model	11 970 982	6 289 628
Payphone Model	383 260	22 929
Directories Model	680 000	680 000
Disabled Users' Services Model	16 336	16 336
Consultancy fees	239 380	-
Total direct net cost	13 734 917	7 453 852

Source: USO Model, TERA Consultants Analysis

[4] Decision D04/11, 'Decision on the costing of universal service obligations: Principles and Methodologies', 31 May 2011 (hereinafter "D04/11")

[5] PwC – "Report of factual findings in connection with eircom's application for funding in respect of the universal service obligation for the year ended 30 June 2016 ("the USO Funding Application") in compliance with D04/11 Decision 22".

- eir used the 2016 CAM[6] to produce cost avoidability inputs in the Customer Model. These refer, in particular to (a) the border of the housing area and (b) the split of costs (capex) between housing areas and isolated areas by underground/overhead network.
- eir used the 2009 CAM to calculate the level of avoidability of capex within isolated areas.
- TERA considers eir's use of the 2016 CAM in its 2015/16 USO funding application is inappropriate, and in particular, its mixed use with elements of the 2009 CAM is incorrect. TERA notes in particular that eir's allocation of costs based on the "urban/rural" classifications in the 2016 CAM and the "housing/isolated areas" classifications in the 2009 CAM, is incorrect as these two classifications are not the same and are not directly substitutable.
- TERA considers that eir should have used the 2016 CAM for its 2015/16 funding application. The 2016 CAM is based on eir's access network (financial and network specific data) which models more precisely eir's network at a street/road level in order to calculate the cost for very specific geographic areas.
- TERA has calculated cost avoidability curves based on the 2016 CAM (see proposed ComReg methodology[7] in section 7.2.1) and applied them to eir's 2015/16 Customer Models. Using the proposed ComReg methodology TERA has estimated that a downward adjustment to the direct net cost of eir's 2015/16 Customer Model of circa €5.68M is required.

Table 1 illustrates eir's 2015/16 USO funding application, and TERA's downward adjustment to the direct net cost.

2.3 Calculated direct net cost

TERA's assessment concludes that the calculated direct net cost is approximately €6.28M lower than the direct net cost figure claimed by eir. TERA's assessment of **€7.45M** can be broken down as follows:

1. **The calculated direct net cost of the Area Model is €444,959.** The Area Model demonstrates that about [✂[redacted]] of MDF areas[8] appear to be entirely uneconomic while [✂[redacted]] of MDF's appear to be entirely economic (on a

[6] The 2016 CAM is the latest version of the Fixed Access Network LRAIC model developed by ComReg. Compared to the 2009 CAM, the 2016 CAM is based on more detailed and up to date data than that used in the 2009 CAM. The 2009 CAM has some limitations (e.g. the prevailing computer power to perform complex calculations the lack of available geomarketing data at that time) It contained financial data from 2009 to 2014.The 2016 CAM was finalised in May 2016.

[7] Refers to the proposed methodology developed by TERA in December 2019 setting out the manner in which the 2016 CAM should be applied to the Customer Model of eir's 2015-2016 USO funding application

[8] From a base of 1,064 MDFs

revenue less costs basis). [✂[redacted]] of MDFs contain *some level* of uneconomic customers[9] but TERA notes that the number of uneconomic customers as a percentage of total customers in each economic MDF is low.

2. **The calculated direct net cost of the Customer Model** (Uneconomic customers in economic areas) **is €6,289,628**. This constitutes 84% of the total direct net cost, which highlights the need for particular focus on the Customer Model and its methodological approach**.** This includes an adjustment made by TERA in light of eir's inappropriate use of the 2016 CAM, and its incorrect mixed use with elements of the 2009 CAM. .
3. **The calculated direct net cost of the Payphone Model is €22,929.** TERA made an adjustment to the Payphone Model in eir's 2015/16 USO funding application to include advertisement revenues in the direct net cost estimate. TERA, having considered the notification requirements set out in D08/14[10] has made a further adjustment to the calculated direct net cost of the Payphone Model, following which, the adjusted calculated direct net cost is €22,929.
4. **The calculated direct net cost of the Directories Model is €680,000.**
5. **The calculated direct net cost of the Disabled Users' Services Model is €16,336.**

   The calculated direct net cost does not include the cost of consultancy fees claimed by eir (€0.24M). This is based on the reasoning and principles set out in ComReg's Decision D04/11[11].

TERA's assessment is that:

- **the calculated direct net cost is €7.45M ;**
- **the calculation of the calculated direct net cost is accurate; and**
- **the calculations and methodology for the calculated direct net cost are in accordance with D04/11.**

[9] MDFs are either entirely uneconomic or only some of the customers in the MDF are uneconomic. (i.e. it contains economic and uneconomic customers).

[10] "Universal Service – Provision of Public Payphones: Review of Usage Threshold for Removals" ComReg Document No.16/43, Decision 08/14.

[11] "Decision on the Costing of universal service obligations: Principles and Methodologies" ComReg Decision D04/11 (31 May 2011) https://www.comreg.ie/csv/downloads/ComReg1142.pdf

2.4 Outline structure of TERA's report

The remainder of this report is structured as follows:

- **Section 3** - Methodological overview
- **Section 4** - Assessment of the treatment of revenue data, including:
  - Assessing which categories of revenues are relevant and how revenues are allocated.
- **Section 5** - Assessment of the treatment of costs, including:
  - Assessing which categories of costs are relevant, how they are allocated, which costs are avoidable and which are distance sensitive.
- **Sections 6 – 10** - Assessment of the methodology and review of the calculation of the direct net cost in each part of the USO Model as follows:
  - Area Model – uneconomic MDF areas
  - Customer Model – uneconomic customers in economic MDF areas
  - Payphone Model – uneconomic payphones
  - Directories Model – directory services
  - Disabled Users' Services Model – services to disabled users
- **Section 11:** Assessment of any overlaps between estimates of the direct net costs in the USO Model with estimates of the benefits in the intangible benefits model (Enhanced brand recognition, Ubiquity, Life cycle benefits, and Marketing benefits).

3 Methodological overview

This report summarises TERA's assessment of eir's 2015/16 USO funding application. It includes a description of all tasks performed by TERA for the assessment of eir's methodology and subsequent calculation of the direct net cost of each individual USO model, and a summary of TERA's analysis of potential overlaps with the intangible benefits model.

As part of TERA's assessment, TERA reviewed eir's 2015/16 USO funding application for consistency with the principles, methodologies and calculations for the direct net cost as set out in D04/11, in particular with Decisions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 25, 27, 29 and 36 of D04/11 (see Appendix 1, Section 12 of this report for all Decisions 1 to 36).[12] TERA's assessment followed the below general approach:

- **Step 1** - Review of the Agreed Upon Procedures ("AUP") Report[13] provided by PwC as per Decision 22 of D04/11. The AUP report summarises the procedures and checks performed by PwC on eir's cost and revenue input figures, including a comparison of the values in the USO Model input sheets back to eir's source workbooks and a reconciliation of the USO Model to the HCA regulatory accounts. TERA confirmed that the scope of the AUP report covers the agreed in scope USO Model inputs and contains the appropriate level of revenue and cost detail. This also involved a detailed review by TERA of the data sources, methodology and calculations in eir's USO model.

- **Step 2** - Gained an understanding of eir's approach to, and calculation of, the foregone revenue and avoidable operational expenditure ("OPEX") and capital expenditure ("CAPEX") cost data. In doing so, TERA had regard to the origination, interpretation and use of call volume data, and also took account of geographic allocations and efficiencies, and in particular, Decisions 1 to 9 of D04/11.

- **Step 3** - Assessment of eir's methodology and subsequent calculation of the direct net cost of each part of the USO model, in terms of ensuring that data is classified correctly, processing revenue and cost data, estimating the calculated direct net costs in uneconomic areas and of uneconomic customers in economic areas, as well as the calculated direct net cost of other USO services (Payphones, Directories etc.). As part of this assessment, TERA primarily considered methodology changes against eir's 2014/15 USO funding application.

- TERA also considered whether its previous recommendations, which arose from TERA's assessment of eir's 2009/10 USO funding application (and were in existence

[12] As a number of the individual Decisions within D04/11 are either matters for ComReg or are of a general nature (such as those relating to the format, timing or supporting documentation required for the USO funding application), while TERA was cognisant of such decisions, they are not directly analysed in this report.

[13] PwC – "Report of factual findings in connection with eircom's application for funding in respect of the universal service obligation for the year ended 30 June 2016 ("the USO Funding Application") in compliance with D04/11 Decision 22".

at the time eir's 2015/16 USO application was submitted), were taken into account and, where feasible, implemented.

- The Decisions relevant to the particular USO models are:
    - Area Model: Decision 11, Decision 12.
    - Customer Model: Decision 10, Decision 12, Decision 13, Decision 14 and Decision 25.
    - Payphone Model: Decision 16 and Decision 27.
    - Directories Model: Decision 17.
    - Services for Disabled Users Model: Decision 18.

ComReg requested[14] that eir use the 2016 CAM for all future funding applications, including the 2015-2016 Application. The 2016 CAM (the "2016 CAM")[15] is the appropriate CAM to be used for all TERA's cross checks of geographical cost allocations. The 2016 CAM is based on the most current and granular information provided by eir in relation to its network, and hence better reflects the actual eir network costs incurred.

eir has used a mixture of the 2009 CAM and the 2016 CAM in its 2015/16 USO Customer Model.

eir has used the 2016 CAM model to produce the cost avoidability inputs it has used in the 2015/16 USO Customer Model. These refer, in particular, to (a) the border of the housing area and (b) the split of costs (capex) between housing areas and isolated areas, by underground/overhead network.

eir has used the 2009 CAM (maintained at the FY 2013/14 level) to calculate the level of avoidability of capex within isolated areas.

TERA considers that eir should have used the 2016 CAM in its 2015/16 USO funding application, and in particular in its Customer Model. TERA was requested by ComReg to make an assessment of the USO net cost of uneconomic customers in economic areas based on the use of the 2016 CAM.

TERA proposed a methodology ((the "proposed ComReg methodology") presented in more details in section §7) is based on the sole use of the 2016 CAM.

As part of the Step 3 assessment, the 2016 CAM is used by TERA as a cross check to ensure that there is consistency in the application of network design rules. (i.e. that the same design rules are consistently applied, to avoid cherry picking or modelling of less favourable approaches).

- **Step 4** - TERA analysed and identified any potential overlaps with and double-counting between the USO direct net cost model and the intangible benefits model

[14] ComReg correspondence to eir of 21 March 2017

[15] The revised CAM published in 2016 - a bottom up model developed by TERA for ComReg which is used to determine wholesale access prices.

as per Decision 36. TERA considered whether eir's 2015/16 USO funding application is acceptable overall from a technical standpoint (e.g. technological choices, dimensioning and planning, etc.) and economic perspective (e.g. cost allocation choices, cost standards, etc.).

Furthermore, once all methodological changes were reviewed, in order to assess any input based changes and to quantify their impact on the calculated direct net cost, TERA compared the 2015/16 adjusted direct net cost results with the 2014/15 adjusted direct net cost results by comparing both the main inputs (revenues and costs incurred) and the total net cost calculated by the two models (after adjustments by TERA). It should be noted that any references to 2014/15 direct net cost results are for comparison purposes only.

TERA's key conclusions are summarised within text boxes throughout this report.

4 Revenue data

4.1 Section Overview

Revenue data consists of both direct and indirect revenues as outlined in D04/11, Decision 2, Decision 3, Decision 4, Decision 5, Decision 6 and Decision 7. In summary:

- Decision 2 sets out the basis for calculating avoidable costs relevant to the calculation of the direct net cost
- Decision 3 sets out the basis for calculating USO revenues related to these costs.
- Decisions 4 and 5 set out the scope of direct revenues to be included in the USO models
- Decision 6 sets out the scope of indirect revenues to be included in the USO models
- Decision 7 sets out the basis upon which the USP may use an alternative approach for the calculation of indirect revenues.

The full text of these decisions is listed below (and in Appendix 1, Section 12 of this report):

Decision 6: *Indirect revenues shall include those revenues which are not directly invoiced to a customer for the services provided directly by the USP. They include:*

• Wholesale interconnection revenues: fixed termination and transit services as a result of inbound calls from another fixed / mobile networks, where an OAO is invoiced for terminating and transiting a call on the USP network;

• Non-geographic numbers (e.g. 1800, 1850, 11811 and 1890 numbers);

• Economic USO customer calls to an uneconomic customer: firstly, the revenue of the economic customers' calls to uneconomic customers shall be allocated to the uneconomic customer. If the uneconomic customer is now economic, as result of the allocation, then a second stage is required to ensure that this treatment does not make the previously economic customer into an uneconomic customer as a result. If as a result of this second stage the economic customer becomes uneconomic, then it is only that portion of revenue which the economic customer can spare without making themselves uneconomic that should be allocated;

• Leased Lines: where initially all revenues associated with the leased line are allocated to the uneconomic line. If the uneconomic point is now economic, as a result of the allocation, then a second stage is required to ensure that this treatment does not make the previously economic point into an uneconomic point as a result. If as a result of this second stage the economic point becomes uneconomic, then it is only that portion of revenue which the economic point can spare without making themselves uneconomic should be allocated; and

• Replacement calls: where a net cost exists, replacement calls shall be estimated and added to the net cost calculation (but only in circumstances where "uneconomic" areas or customers have been firstly identified as commercially uneconomic).

Decision 7: *Where it is clearly demonstrated that due to a lack of information beyond the control of the USP, that it is not practicable for indirect revenues to be calculated in accordance with Decision No. 6, the USP may use an alternative approach, provided that it is properly supported with reasonable assumptions.*

The revenue data is sourced from eir's corporate data warehouse and includes revenues from connections, rentals, calls and other revenues.

This section assesses the treatment of the revenue data in terms of which categories of revenues are relevant for inclusion in /exclusion from the direct net cost calculation and how they are allocated (what share of total revenues is to be attributed to a specific MDF or customer, and in what time perspective (i.e. allocation of costs over time)). It is structured as follows:

- Revenue scope
    - Revenue exclusions
- Revenue data allocation
    - Allocation of revenues to MDFs
    - Allocation of one-off revenues
    - Identification and separation of NGA revenues
- Conclusion

4.2 Revenue Scope

4.2.1. Revenue exclusions

eir's 2015/16 USO funding application excluded certain revenues from the scope of the direct net cost estimation for a number of different reasons (e.g. the corresponding services are not based on the copper network; the revenues are not intrinsic to any specific MDF; unavailable data; immaterial value; or revenue that is not generated from eir lines).

TERA notes that eir has made several changes to the revenue data treatment aimed at improving the net cost model. These changes partially explain the changes in the model results.

TERA has checked the reasonableness of eir's 2015/16 exclusion of each of the revenue categories, with eir's 2009/10 USO funding application revenue exclusions. TERA has also checked any revenue category changes in 2015/16 with those excluded in eir's 2014/15 USO funding application.

TERA, in eir's 2009/10 USO funding application, considered that the exclusion criteria for 3 of 44 excluded revenue elements (National Freefone, International Freefone and Interconnect Links) were unclear. While TERA considered that it was acceptable for the 2009/10 USO funding application as these revenue elements constituted only [✂] of the total revenue and the possible impact on the net cost would have been marginal, TERA sought further clarification from eir regarding its reasoning for future submissions. This further rationale was provided in eir's 2015/16 USO funding application, which TERA notes is consistent with eir's approach in its final 2014/15 USO funding application.

In relation to the first two revenue types, National Freefone and International Freefone services, the services are first described below and then eir's rationale for their exclusion is set out:

1. National Freefone

National Freefone is a short number service (1800, 1850 or 1890 numbers) that allows special pricing, whereby the receiving party fully or partially pays for the cost of the call. This National Freefone service operates with calls from eir's network, from a fixed-line OAO[16] or from a mobile operator.

2. International Freefone

International Freefone service allows calls from abroad. International Freefone revenues correspond to charges paid by hosted retail operators of freefone numbers, including one-off connection charges, fixed access charges and traffic based charges.

eir's rationale for excluding part of the National and International Freefone revenues is as follows:

[16] Other Authorised Operator

- Part of the Freefone (National and International) revenues may be lost if the MDF where a Freefone call is terminated is disconnected. National Freefone revenues may also decrease if the MDF supporting the associated call origination is disconnected.

- To take account of this eir has checked whether the MDFs where freefone calls (National and International) are terminated, are generally MDF's classed as large economic exchanges, or whether they are uneconomic MDF's (which absent the USO, eir could choose to disconnect). To test this, a sample of 750 freefone calls (terminating on eir's fixed network) were checked. eir concluded that [✂] of the corresponding MDFs belonged to the top quartile[17] of MDFs in terms of the number of lines[18].

eir did not exclude all of the Freefone revenues – it only excluded the connection and fixed access revenues (because they are located in large MDFs that were proven to be less likely unprofitable).

eir did not exclude other traffic-based revenues associated with calls originating/terminating on eir's network.

TERA's view is that eir has justified its exclusion of parts of the National and International Freephone revenues from the USO Models. Based on eir's sampling of Freefone calls, Freefone revenues appear unlikely to be significantly impacted if eir was to disconnect an uneconomic MDF as the bulk of Freephone revenues are more closely linked to large economic MDF's, which absent the USO, eir would not choose to remove from its network.

TERA concludes that the revenues categories (not including traffic revenues):

- **International Freefone; and**
- **National Freefone,**

were excluded on reasonable grounds for the purpose of the USO direct net cost calculation, as only revenues related to large MDFs that are less likely to be uneconomic were excluded.

[17] The top quartile refers to MDFs ranked by size (based on the number of lines). In this instance [✂] of Freephone calls are terminating within the top 25% MDFs within eir's network.

[18] Frontier Supplemental Report.

3. Interconnect Links

Interconnect Links are high capacity transport links, interconnecting eir with carrier pre-select operators, the largest of whom is BT. eir explain that all the OAOs, except BT, are interconnected at a high level in the network while a significant proportion of BT's interconnection points are at tertiary exchange level.

eir considers that much of this traffic originates or terminates with mobile operators, and therefore it is not relevant to the USO revenue data. eir considers it is unlikely that Interconnect MDFs (supporting primary, tandem and double tandem interconnection) are located within uneconomic areas.

The demand for high-capacity links is unlikely to be impacted by the disconnection of some areas and/or end users disconnections. As a result only a significant change in the volume of traffic will result in a reduction in the number of interconnect voice circuits.

TERA concludes that the revenues category Interconnect links was excluded on reasonable grounds for the purpose of the USO direct net cost calculation, as they are only linked to large MDFs that are less likely to be uneconomic.

TERA also considered the exclusion criteria for the remaining 41 excluded revenue elements. These excluded revenue elements may be summarised into the following five categories; non-USO services; large MDF based services; non MDF specific services; competitive services; not relying on legacy copper loop.

eir's rationale for the excluded revenue elements is set out in more detail below:

1. Non USO services

eir consider it is possible to exclude the services that are not a part of USO on the condition that both the associated eir costs and eir revenues are excluded.

Fibre leased lines are not a part of the USO, therefore eir revenues and corresponding fibre costs and civil works are excluded.

'All ISS[19] revenue' are associated to access to Internet and are therefore excluded.

2. Large MDF based services

eir considers that large MDFs are likely to be economic and the exclusion of revenue and costs linked to these MDFs does not change the resulting net cost. Therefore, the following services linked to large MDFs and delivered by way of core network fibre are excluded from the net cost calculation:

- Leased lines: as they are either delivered by way of fibre or are international leased lines and they are linked to large urban MDFs and therefore unlikely to be uneconomic. TERA notes that this equals [✂] in excluded revenues.

[19] ISS: Internet Supply Services: Value added internet dependent – not intrinsic at a customer/exchange level- revenues not dependent on the customer base. As opposed to conveyance of dial-up internet traffic.

- Ancillary products: this category includes mainly wholesale revenues from access to Eir 1850/90, access to OAO (Other Authorised Operators) 1800 numbers and access to Universal Access numbers. These calls do not originate in any particular MDF, and called numbers are likely to be located in larger MDFs. TERA notes that this equals [✂] in excluded revenues.
- 'Co-location' services: as their revenues could not be easily allocated to MDFs and in practice are located in larger, economic MDFs. TERA notes that this equals [✂] in excluded revenues.
- Property services: their revenues are only associated with office buildings and some large Dublin MDFs. TERA notes that this equals [✂] in excluded revenues.

3. Non MDF specific services

eir considers that some categories of eir's services are not associated with any particular MDF. The corresponding revenues would not therefore change if an uneconomic MDF is removed.

Repayable works orders and wholesale managed services (relating to white label services) are not associated with any specific MDF and have therefore been excluded.

4. Competitive services

eir considers that revenue from apparatus supply is the revenue associated with corporate equipment, which is provided in competitive conditions, it is not a part of USO and therefore is excluded.

5. Services not reliant on copper loop

eir considers that revenue of services delivered by way of the core network fibre (such as VOIP) and do not rely on the copper loop (such as FTTH) are not included in its direct net cost as these services are provided by eir on commercial basis.

In relation to the above five revenue categories TERA concludes that it is reasonable to exclude these revenues based on the following rationale:

(1) As the service is not within the scope of USO (and is provided by eir on a commercial basis); or
(2) As the service is highly likely to be profitable (and as a consequence would not lead to any change in the net cost calculation).

For the above reasons TERA considers that eir's rationale for exclusion of these 5 revenue categories is reasonable and that they can be excluded from the USO model.

4.3 Revenue data allocation

4.3.1. Allocation of revenues to MDFs

TERA is of the view that the allocation of revenues to MDFs is properly performed for 2015/16 and is in accordance with the requirements of Decision 6 and Decision 7 of D04/11. TERA notes that for 2015/16, revenue data for the all 12 months of the financial year was provided by eir. This is in line with ComReg's recommendations in Consultation D13/45 and in Decision D01/14[20] that complete indirect revenue data should be provided.

4.3.2. Allocation of one-off revenues

Decision 4 sets out the scope of direct revenues to be included in the USO models:

> ***Decision 4:*** *Direct revenues shall include those revenues which are directly invoiced to a customer for the services provided directly by the USP. They include:*
>
> *• One-off connection charges: where the revenue should be allocated over the expected life of the customer. In circumstances where a line is permanently disconnected, the remaining unallocated one-off connection charges should be allocated to that year of disconnection;*
>
> *• Revenues associated with access (e.g. line rental);*
>
> *• Calls (e.g. local, national, mobile, international, directory enquiries ("DQ") and premium rate services); and*
>
> *• Complementary services, such as, broadband services.*

In accordance with Decision 4, eir, in its 2015/16 USO funding application allocated all the one-off revenue categories to the year in which they were incurred[21], except PSTN connections which were recognised in the same period as the initial connection, without amortization (see Table 2). The PSTN connection charges are offset by the corresponding costs, which are treated in a similar manner. eir explain that the margin of the PSTN connection service is close to zero.

Table 2. Time allocation of one-off revenues

One-off revenue category	TERA's 2015/16 assessment
RAT connection revenues	Amortised over customer lifetime[22] in the Area Model
PSTN connections	Not amortised
Other one-off revenues	Amortised over customer lifetime

Source: TERA analysis

[20] ComReg Document 13/45: Consultation and Draft Determination on the Assessment of Eircom's Universal Service Fund Application for 2009-2010, section 4.3.2; and ComReg Document 14/03, Decision D01/14: Assessment of Eircom's Universal Service Fund Application for 2009-2010– Response to Consultation and Determination, section 4.14.

[21] Frontier Report page 13

[22] Not amortised in regulatory accounts but is amortised in Area Model over a [✂] customer lifetime.

eir states that all the connection revenues (excluding RAT and PSTN) are already amortised within the regulatory accounts, over expected customer lifetime[23]. Thus regulatory amortisation is already incorporated within the USO model input data.

RAT connection revenues are not amortised within the regulatory accounts. The RAT connection revenues are however amortised within the Area Model, over a [✂] lifetime of a customer. The PSTN connection cost was not included in the amortisation. As the treatment for costs is similar to the treatment of revenues, this approach is acceptable.

TERA considers that this treatment of one off revenues is acceptable and in line with Decision 4 of D04/11.

4.3.3. Identification of NGA revenues

Eir's final 2014/15 USO funding application noted that costs and revenues related to Next Generation Access (NGA) Network were broken out separately in eir's regulatory accounts. These NGA costs and revenues were then broken out further into more granular asset classes in eir's 2015/16 USO funding application. This provides greater granularity on costs and associated revenues within cost categories, however the overall scope of the costs included in the USO model remains the same.

TERA is of the view that it was appropriate to update the cost categories to:

(1) reflect the change in the categorisation of cost/revenues associated to the NGA network; and
(2) then reflect the actual costs and revenues included in the USO model as outlined in Decisions 2, 3 and 6 of D04/11.

4.4 Conclusion

TERA concludes that the approach to the treatment of the revenue data in eir's 2015/16 USO funding application is reasonable and that it is consistent with Decisions 2 to 7 of ComReg Decision D04/11. A summary of eir's rationale for revenue exclusions, revenue allocation and TERA's assessment is also set out in Table 3 below.

[23] Frontier Report, Page 13

Table 3 – Summary - Revenue Data Changes

Change	eir's rationale for the change	TERA's assessment
Revenue data exclusions	Non USO services Large MDF based Services (this includes Freefone (national and international) and Interconnect links) Non MDF specific services Competitive services	May be excluded for the purpose of USO direct net cost calculation.
Allocation of one-off revenues	One-off revenue categories are allocated to the year in which they were incurred[24] except PSTN connections which are recognised in the same period as the initial connection, without amortization. The PSTN connections are offset by the corresponding costs, which are treated in a similar manner. All the connection revenues (excluding RAT and PSTN) are already amortised within the regulatory accounts, over expected customer lifetime[25]. Thus regulatory amortisation is already incorporated within the model input data. RAT connections are amortised in the Area model.	The PSTN connection cost was not included in the amortisation. As eir's treatment for costs is similar to the treatment of revenues, this approach is acceptable.
Identification of NGA revenues separately	'Re-categorisation' of NGA associated costs separately to follow the change in the FAR categorisation	TERA agrees with this change as it ensures that eir is taking into account "all" capital costs and "all" operating costs as per the Decision 2 of D04/11

Source: Frontier Report, USO Model Documentation 2015/16; and TERA analysis

[24] Frontier Report, page 13

[25] Frontier Report, Page 13

5 Cost Data

5.1 Section Overview

Decisions 1, 2, 8 and 9 of D04/11 apply to the cost data used by eir in its calculation of avoidable costs. Cost data includes OPEX and CAPEX of access networks and of core networks. In summary:

- Decision 1 states that the HCA methodology, with certain adjustments, is the cost methodology that must be used to calculate the net cost.
- Decision 2 sets out the basis for calculating avoidable costs relevant to the calculation of the direct net cost.
- Decision 8 and Decision 9 set out the basis for determining avoidable costs for inclusion in the net cost calculation, and the methodologies to determine the appropriate level of costs that would have been incurred by an efficient operator.

The full text of these decisions is as follows:

> ***Decision 1:*** *The HCA methodology, properly adjusted for efficiencies and taking account of the costs that could have been avoided by the USP without having the USO, is the cost methodology that must be used to calculate the net cost of the USO.*

> ***Decision 2:*** *USO net costs shall be calculated on the basis of "all" capital costs and "all" operating costs that could be avoided on a HCA basis, as if the provision of services to uneconomic customers by a commercial operator was not required under a USO. It is only the portion of costs, both capital and operational expenditure for the given financial year, that can be directly attributed to the USO service (i.e. the service activity creates the cost) and which could have been avoided without the USO, which are included in the net cost calculation.*

> ***Decision 8:*** *The avoidable costs included in the net cost calculation, shall be those costs reflecting the provision of the USO which a commercial operator would not ordinarily have provided, and which were incurred in the most efficient way. These costs shall relate to: (a) the avoidable capital costs associated with CAPEX i.e. depreciation; (b) OPEX; and (c) overheads for the appropriate financial year.*

Decision 9: *ComReg may use a number of methodologies to determine the appropriate level of costs that would have been incurred by an efficient operator, in order to determine the quantum of adjustments necessary to the USP's net cost calculation. These methodologies may include, but are not limited to, the use of:*

• The review of supporting documentation available, such as: cost-benefit analysis reports; engineering reports; fault reports of geographical areas, and other documents in relation to the business case / investment decisions associated with the network roll-out and upgrade;

• A line fault efficiency rate: applying the national LFI target rate (corresponding to the financial year in question) at a regional level (and allowing for appropriately reasoned variances) ;

• Independent survey report regarding the USP's efficiency;

• Regulatory decisions from other jurisdictions that provide relevant precedents and benchmarks; and

• The development of a model to assess the appropriateness of the efficiency adjustment proposed by the USP.

This section reviews eir's 2015/16 USO funding application cost data for adherence with Decision 1, 2, 8 and 9 of D04/11 under the following headings:

- Cost methodology
  - Included Cost Categories
  - Cost avoidability
    - Access network OPEX; and
    - Avoidable Costs Analysis.
    - OPEX efficiency
  - Cost Allocation
  - Efficiency adjustments
  - "Distance-sensitive" categorisation
  - Cost curves for Core Network
- Conclusion

TERA assessed the treatment of costs in terms of which categories of costs are relevant to the different decisions stated above, how they are allocated between MDFs and lines, which costs are avoidable, and which costs are distance sensitive.

5.2 Cost Methodology

As required by Decision 1 of D04/11, the cost data is taken from eir's historical cost accounts (HCA) and is adjusted for efficiencies and to take account of avoidable costs, calculated in accordance with Decision 2 and Decision 8.

When analysing costs, TERA paid particular attention to the following main issues:

- Which cost categories are included in the USO model and whether they correspond to revenue services
- Which cost categories are defined as avoidable or partially avoidable

- How costs are allocated to MDFs
- How efficiency adjustments are made.

5.2.1. Included Costs Categories

In accordance with Decision 8, the cost data includes OPEX and CAPEX of access networks and of core networks.

TERA first considered the costs categories identified by eir to ensure they were treated correctly. TERA noted that eir included in the 2015/16 USO funding application the following additional costs (which were also included in its final 2010/11 to 2014/15 USO funding applications but were not included in eir's 2009/10 USO funding application):

- BIP and Ethernet SANS (over copper) revenues and OPEX.
- CAPEX associated with the building pool
- The cost of PRA/FRA CPE for ISDN lines

TERA considers that the above costs are correctly included in the USO Model. The accuracy of the input data amounts for BIP, Ethernet SANS and OPEX and the building pool CAPEX within eir's 2015/16 USO funding application have been verified by PWC via the AUP process (by comparing the values on the input sheets back to the source workbooks).

As a result of changes made by eir to the FAR categorisations, a new NGA Network Element was created in 2014/2015, and included in eir's final 2014/15 submission and subsequently in its 2015/16 submission. This NGA network element now separately captures costs that were included within other Network Elements in previous years. Accordingly the inclusion of this new NGA Network Element does not represent an increase in the scope of costs included in the model.

TERA is of the view that the above costs are appropriate for inclusion in the USO Model.

5.2.2. Cost Avoidability

Having considered the cost data, TERA then reviewed the USO Model to assess the proportion of these costs which could be avoided if certain MDF areas were no longer served by eir.

5.2.1.1 Access Network OPEX

If an activity code is 'Indirect'[26], the avoidability percentage is estimated by considering the avoidability of the SRT codes that underlie that activity code.

TERA does not have full information on each individual SRT code however TERA used sampling to check the SRT code categorisation (see section 5.2.1.2 of this report) reviewed as part of the AUP.

Based on this sampling, TERA is satisfied with the SRT code categorisation

5.2.1.2 Avoidable Costs Analysis

The USO Model[27] submitted as part of eir's 2015/16 USO funding application, details the costs that are avoidable at the MDF level.

TERA has used the access network OPEX cost models (based on the 2016 CAM to provide a comparable cross check, by identifying those cost categories that vary in accordance with the number of faults.

This cross-check shows that while certain cost avoidability assumptions are not the same as the 2016 CAM (which is the most recent assessment of eir's cost avoidability assumptions), the differences, in TERA's view, are non-material and are therefore acceptable.

Table 4 below shows the consistency between the avoidability calculation in the 2015/16 USO Model (based on an example from eir's 2010/11 submission) and the implementation rules of the 2016 CAM (colour coded "green" within the OPEX Model column of Table 4).

Some cost categories (see Table 4 - colour coded "violet" within the OPEX Model), are considered unavoidable in the USO Model, while they are partially or fully avoidable in the 2016 CAM. This "unavoidable" assumption is conservative (as most of the time the assumption considers that no cost would be avoided absent USO, and therefore tends to under-estimate the net cost). TERA therefore considers that this approach cannot lead to eir over-estimating the net cost. eir has also provided further explanations for the classification of other cost categories, based upon which TERA concluded that those cost classifications are acceptable (see Table 4 - colour coded grey within the OPEX Model column).

For the reasons stated in this section and Table 4, TERA considers the cost avoidability assumptions applied by eir to be reasonable.

[27] As described by section 3.1.2 of the Frontier Report.

Table 4. Example: Subscriber Unit' network element - Avoidability Analysis (based on data from eir's 2010/11 application) & 2016 CAM cross-check

Colour Coding Legend for OPEX Model Column:

	Corresponds with the 2016 CAM
	Does not correspond with the 2016 CAM, but shows a conservative assumption
	Acceptable based on additional information provided by eir

Activity Code	Description	[redacted]	Category	% avoidable	[redacted]	OPEX Model
GB113	Network Mgmt. Systems	[redacted]	Indirect	[redacted]	[redacted]	Additional information provided by eir: Design for operations in the various network management centres. These are classified as "Indirect" as they related to non-field staff (as opposed to field staff 'directly' involved in repair or maintenance activities).
GB140	DC Power	[redacted]	Indirect	[redacted]	[redacted]	Additional information provided by eir: DC Power Design. These are classified as Indirect as they related to non-field staff (as opposed to field staff 'directly' involved in repair or maintenance activities)
GB148	Switching network – Core	[redacted]	Common	[redacted]	[redacted]	Zero
GB149	Switching network – edge	[redacted]	Indirect	[redacted]	[redacted]	Zero

GF112	Operator Equipment	[✂]	Common	[✂]	[✂]	N/A
GF113	Network Mgmt. Systems	[✂]	Indirect	[✂]	[✂]	Additional information provided by eir: Pay relating to operations in the various network management centres. These are classified as Indirect as they related to non-field staff (as opposed to field staff 'directly' involved in repair or maintenance activities of the access network.
GF122	Network Rates	[✂]	Indirect	[✂]	[✂]	Additional information provided by eir: Includes network rates that are paid to local authorities. It is partially avoidable because, in addition to fixed rates, it includes network rates that depend on the extent of network deployed.
GF140	DC Power	[✂]	Indirect	[✂]	[✂]	Additional information provided by eir: Non-field Staff costs for Maintenance and support agreements for MDF power equipment (rectifiers, batteries, etc.). Classified as indirect as not directly related to OH or UG network.
GF149	Switching network – edge	[✂]	Indirect	[✂]	[✂]	Zero
HA103	Network/Wholesale	[✂]	Common	[✂]	[✂]	→ Rescaled based on staff cost (avoidable)
HA105	General Company (See HA105-A & HA105-B)	[✂]	Common	[✂]	[✂]	→ Rescaled based on staff cost (avoidable)
HA107	GTO	[✂]	Common	[✂]	[✂]	→ Rescaled based on staff cost (avoidable)
HA110	TEM	[✂]	Common	[✂]	[✂]	Zero
IA103	Finance - general activities	[✂]	Common	[✂]	[✂]	"Finance" → NOT Avoidable

JB199	Other Local Systems	[✂]	Common	[✂]	[✂]	N/A
KA101	Corporate Communications	[✂]	Common	[✂]	[✂]	→ Rescaled based on staff cost (avoidable)
KA104	Branding	[✂]	Common	[✂]	[✂]	→ Rescaled based on staff cost (avoidable)
LA101	Corporate Services (Other)	[✂]	Common	[✂]	[✂]	"Corporate Services - Non Pay" → NOT Avoidable
LA107	GTO	[✂]	Common	[✂]	[✂]	Corporate Services - Non Pay" → NOT Avoidable
MA101	Purchasing	[✂]	Common	[✂]	[✂]	"Purchasing" → Rescaled based on staff cost (avoidable)
MB102	Warehousing and Distribution	[✂]	Common	[✂]	[✂]	"Warehousing and Distribution" → Rescaled based on staff cost (avoidable)
ME101	Pay Supplier	[✂]	Common	[✂]	[✂]	"Pay supplier" → Rescaled based on staff cost (avoidable)
MER	All Work & specific equipment on Applied & Pure Technical Research	[✂]	Common	[✂]	[✂]	"Research & Development" → NOT Avoidable
MF101	Accommodation Management	[✂]	Common	[✂]	[✂]	"Accommodation - management" → Rescaled based on accommodation costs (avoidable)
MF102	Appropriation coded Building maintenance costs	[✂]	Common	[✂]	[✂]	"Accommodation" → Rescaled based on non-pay costs (avoidable)
MG101	Management Transport	[✂]	Common	[✂]	[✂]	"Transport management" → Rescaled based on staff cost (avoidable)
MLB	LOCAL DIGITAL E10B.EXCH	[✂]	Direct	[✂]	[✂]	Zero

MLE	LOCAL DIGITAL AXE EXCH	[redacted]	Direct	[redacted]	[redacted]	Zero
MMB	MAINTENANCE AND CLEANING OF BUILDINGS OWNED OR LEASED BY T.E.	[redacted]	Common	[redacted]	[redacted]	"Accommodation" → Rescaled based on non-pay costs (avoidable)
MME	ELECTRICAL INSTALLATIONS	[redacted]	Common	[redacted]	[redacted]	"Accommodation" → Rescaled based on non-pay costs (avoidable)
MNE	EDGE SWITCHING MANAGEMENT O&M	[redacted]	Indirect	[redacted]	[redacted]	Zero
MNN	DATA MANAGEMENT O & M	[redacted]	Direct	[redacted]	[redacted]	Appropriated cost → Rescaled based on staff cost (avoidable)
MNT	NETWORK LEVEL AND SERVICE LEVEL MANAGEMENT SYSTEMS	[redacted]	Direct	[redacted]	[redacted]	Appropriated cost → Rescaled based on staff cost (avoidable)
MNW	WORK MANAGEMENT SYSTEMS	[redacted]	Direct	[redacted]	[redacted]	Appropriated cost → Rescaled based on staff cost (avoidable)
MNZ	NETWORK MANAGEMENT CENTRE FACILITIES	[redacted]	Direct	[redacted]	[redacted]	Appropriated cost → Rescaled based on staff cost (avoidable)

MPC	MICRO COMPUTERS	[✂]	Common	[✂]	[✂]	"IT-OTHER" → Rescaled based on a number of cost categories (incl. staff costs)
MPM	MAINFRAME	[✂]	Common	[✂]	[✂]	"IT-OTHER" → Rescaled based on a number of cost categories (incl. staff costs)
MPR	PLANT RECOVERY, REARRANGEMENT REDEPLOYMENT EXC CHANGEOVERS	[✂]	Common	[✂]	[✂]	Appropriated cost→ Rescaled based on staff cost (avoidable)
MPW	MAINTENANCE OF SOFTWARE	[✂]	Common	[✂]	[✂]	"IT-OTHER" → Rescaled based on a number of cost categories (incl. staff costs)
MPX	IT FACILITIES & S/W DEPLOYMENT	[✂]	Common	[✂]	[✂]	"IT-OTHER" → Rescaled based on a number of cost categories (incl. staff costs)
MTD	MAINTENANCE OF DIGITAL SWITCHING TRUNK NETWORK	[✂]	Common	[✂]	[✂]	Zero
MXP	CUSTOM HOUSE DOCKS EXCH	[✂]	Common	[✂]	[✂]	N/A
MXY	DC Power Maintenance	[✂]	Indirect	[✂]	[✂]	Appropriated cost→ Rescaled based on staff cost (avoidable)
NA101	Manage the Business	[✂]	Common	[✂]	[✂]	"Manage the business - Other" → NOT Avoidable
NA106	Wholesale	[✂]	Common	[✂]	[✂]	"Manage the business - Other"

						→ NOT Avoidable
NA108	GTO	[✂]	Common	[✂]	[✂]	N/A
UWF	FLEXIBLE EXTENDED WORKING HOURS	[✂]	Direct	[✂]	[✂]	Zero
Non-Exceptional	-	[✂]	Common	[✂]	[✂]	N/A

Source: Frontier Report, USO Model Documentation 2015/16, Table 9 p.39; TERA analysis

5.2.3. Cost Allocation

5.2.1.3 Cost Drivers – Access OPEX Allocation Across MDFs

In the Frontier Report (section 3.1.3), eir details the cost drivers used to allocate avoidable OPEX to MDFs.

TERA has reviewed the above cost drivers and compared them, as a cross-check, with the cost drivers in the 2016 CAM (see Table 5 - OPEX Model column). Some cost drivers are the same as in the 2016 CAM (see Table 5 - highlighted in "green" within the OPEX Model column). Some cost drivers are not exactly the same, however TERA considers that the approach is reasonable and can be explained by the differences in the available data (see Table 5 - highlighted in "grey" within the OPEX Model column).

In eir's initial submissions in each of its previous (2010-2015) USO funding applications the "Repair – access" cost category was allocated exclusively based on the number of faults. However, TERA noted that repair activities are performed by "service assurance teams" which are organised by service assurance areas.

As a consequence, TERA informed ComReg that it considered that these costs should be first allocated to the service assurance areas based on the number of staff. Repair activities should then be allocated to the MDFs within the area based on the number of lines of number of faults. TERA's view is that such an approach is more in line with the cost causality principle as it reflects that faults may be more expensive to address in some areas (e.g. due to longer transport times for maintenance team). This also reflects that repair team sizes are assembled based on these factors and, furthermore, this approach is more in line with the 2016 CAM cross-check.

TERA made a number of recommendations to ComReg in relation to eir's "Repair – access" cost category during the assessment period of eir's initial 2014/15 USO funding application for previous periods. This led to eir changing its approach to the "Repair – access" cost category in line with TERA's recommendation in its final 2014/15 USO funding application. This change is reflected in eir's 2015/16 application.

TERA considers that eir's cost driver assumptions in the 2015/16 USO funding application are reasonable.

Table 5. Cost allocation drivers - Avoidable OPEX to MDFs (based on eir's 2015/16 submission)

Colour Coding Legend for OPEX Model Column:

	Same as OPEX model of the 2016 CAM or zero cost
	Different from OPEX model of the 2016 CAM but differences are reasonable and non-material

Network Element	Cost Driver	CAM - OPEX Model
Copper Access Network	Varies depending on appropriation code (see below) Includes expenditure on preventative and restorative maintenance, number of working lines, and number of faults	-
Provisioning – Access	Physical Provides (ULMP[28], PSTN/ISDN, DSL-R[29], DSL-B[30], SB-WLR[31])	Allocation to the service assurance teams number of staff and then to the MDF within the service area based on the active lines
Provisioning – Retail	Physical Provides (DSL-R, DSL-B, SB-WLR)	Allocation to the service assurance teams number of staff and then to the MDF within the service area based on the active lines

[28] Unbundled Local Metallic Path

[29] Digital Subscriber Line-Retail

[30] Digital Subscriber Line-Bitstream

[31] Stand-Alone Broadband Wholesale Line Rental

Provisioning – Leased Lines	Number of working lines (leased lines)	Allocation to the service assurance teams number of staff and then to the MDF within the service area based on the active lines
Repair – Leased Lines	Number of working lines (leased lines)	Allocation to the service assurance teams number of staff and then to the MDF within the service area based on the active lines
Repair – Access	Number of faults -> changed to Number of repair staff combined with number of faults (MSO, MSN, MCY, Total faults)	Allocation to the service assurance teams number of staff and then to the MDF within the service area based on the active lines
Subscriber units	Number of working lines (DSL)	Zero
Legacy leased line equipment (Dassnet)	Gross Book Value relating to leased lines (asset classes 2814, 2818, and 2821)	Zero
DSLAMs	Number of working lines (DSL)	Zero
Building Pool	Number of working lines (All copper lines; DSL BIP (Copper), Suplementary services, FTTC lines) Gross Book Value relating to leased lines (asset classes 2314, 2318, and 2321)	Allocated based on number of working lines
Retail DSL	Number of physical provides (DSL)	Zero
Retail PSTN / ISDN	Number of physical provides (PSTN/ISDN)	Zero
BIP	Number of working lines (Supplementary services)	Zero
NGA	Number of working lines (FTTC- DSL-R and DSL-B)	Zero

Source: Frontier Report USO Model Documentation 2015/16, Table 11 p42

5.2.4. Efficiency adjustments

Decision 9 of D04/11 (set out above) refers to the possibility of using a number of methodologies to determine *"the appropriate **level of costs** that would have been incurred by an efficient operator..."* and lists five types of methodologies that may be used to determine the quantum of adjustments necessary.

eir has made a number of efficiency adjustments in line with Decision 9. First, eir made efficiency adjustments based on the second of the methodologies in Decision 9, *"line fault efficiency rate*". eir's efficiency adjustment to the LFI led to a downward adjustment to the direct net cost as eir's average national LFI is higher than that set by ComReg.

Second, eir incorporated other efficiency adjustments into its 2015/16 USO Models based on the fifth Decision 9 methodology, in respect of the following maintenance activities:

- MLC: Reactive maintenance costs associated with customer carriers.
- MLO: Reactive maintenance costs associated with copper overhead network.
- MLU: Reactive maintenance costs associated with copper underground network.

Furthermore, two steps of efficiency adjustment of the LFI rate have been used in the USO model:

- An efficiency adjustment at the national level if the actual national fault of eir is higher than the PIP target rate set by ComReg.

- As eir's actual fault rate (11.94%) is lower than the average rate (13.5%) between the PIP target rate set by ComReg for the period from July to December 2015 (14.5%) and the one applied for the period from January to June 2016 (12.5%), no efficiency adjustment has been made at the national level.

- As the same level of efficiency may not be achieved for all areas of Ireland, a 2nd efficiency adjustment is envisaged. For each MDF, eir's number of faults is compared to the results of a modelling of a target number of faults based on the characteristics of the area (percentage of carriers, percentage of cables on poles, number of working lines, percentage of DSL lines, working line density(working lines per sq. km)). The number of faults for MDFs significantly above the target are adjusted (the actual number of faults is considered as an outlier if it is higher than the one predicted by the regression plus the standard deviation).

TERA agrees with eir's efficiency adjustment in the calculation of faults costs

5.2.5. "Distance-sensitive" categorisation

Distance sensitive costs are those that vary depending on the length of a line. Data from the 2009 CAM[32] (is used to allocate these costs to housing and isolated areas. eir's Frontier Report (section 3.1.4) maps the network service elements to 3 categories:

- Distance-sensitive
- Non distance-sensitive
- Provisioning

This classification is an input to the calculation of avoidable costs at the customer level.

TERA has reviewed this mapping based on the 2016 CAM and concluded, based on available classification information, that this is a reasonable approach for each cost element.

The details of this cost allocation or mapping are provided in Table 6 (Details from the OPEX Model and Analysis column).

Based on the further details and explanations provided by eir (as stated in table 6 below), TERA has sufficient information to determine that eir's approach to "distance- sensitive" cost categorisation is reasonable.

[32] For year 2013 - the last year implemented in the 2009 CAM model. ComReg had accepted that eir *"prepare avoidable cost shares by taking an single year (e.g. FY 2013/14) as a reference"* where the 2009 CAM was being used.

Table 6. Mapping of distance sensitive, and non-distance sensitive Network Service Elements to services and provisioning

Legend:

	Acceptable to TERA

Network Element	Specific Network Element (or appropriation code for Copper Access Network)	Associated service	Provisioning, Distance sensitive or Non-distance sensitive	TERA's Assessment
Copper Access Network	MLC	Based on split in regulatory accounts	Distance sensitive	MLC - Customer Carriers → OK as the number of faults increases with the distance
Copper Access Network	MLG	Based on split in regulatory accounts	Distance sensitive	MLG - Lightning Damage → OK as the number of faults increases with the distance
Copper Access Network	MLI	Based on split in regulatory accounts	Distance sensitive	MLI – Pressurisation → OK as the number of faults increases with the distance
Copper Access Network	MLO	Based on split in regulatory accounts	Distance sensitive	MLO - Overhead Network → OK as the number of faults increases with the distance
Copper Access Network	MLR	Based on split in regulatory accounts	Non-distance sensitive	MLR - Mtce Local Radio → OK as local radio costs are not distance-driven
Copper Access Network	MLU	Based on split in regulatory accounts	Distance sensitive	MLU - Underground Network → OK as the number of faults increases with the distance

Copper Access Network	MRO	Based on split in regulatory accounts	Distance sensitive	MRO - Unbillable damage – overhead → OK as the number of faults increases with the distance
Copper Access Network	MRU	Based on split in regulatory accounts	Distance sensitive	MRU - Unbillable damage – underground → OK as the number of faults increases with the distance
Copper Access Network	MVO	Based on split in regulatory accounts	Distance sensitive	MVO - Overhead Network → OK as the number of faults increases with the distance
Copper Access Network	MVU	Based on split in regulatory accounts	Distance sensitive	MVU - Underground Network → OK as the number of faults increases with the distance
Copper Access Network	MTT	Based on split in regulatory accounts	Non-distance sensitive	MTT – Records As explained by Eir, they consider it is more appropriate to treat MTT costs as non-distance sensitive given that the information recorded in ANMR primarily involves the recording of cable characteristics at discrete (non distance) originating or termination nodal points (MDF, Drop point, Cabinets) and the location of these points. → OK
Copper Access Network	MXY	Based on split in regulatory accounts	Non-distance sensitive	MXY - DC Power Maintenance → OK as related to Eir sites
Copper Access Network	GF122	Based on split in regulatory accounts	Non-distance sensitive	GF122 - Network Rates As explained by Eir, GF122 relates to the network rates that are paid by Eir to local authorities.

				→ OK
Copper Access Network	GB101	Based on split in regulatory accounts	Non-distance sensitive	GB101 - Access Nwk. Overhead As explained by Eir, it relates to primarily non-field staff costs for Network planning and Design of the Access Network. These are both treated as non-distance sensitive since they are central costs that do not vary with the size of the network in terms of line length. →OK
Copper Access Network	GB102	Based on split in regulatory accounts	Non-distance sensitive	GB102 - Access Nwk. Underground As explained by Eir, it relates to primarily non-field staff costs for Network planning and Design of the Access Network. These are both treated as non-distance sensitive since they are central costs that do not vary with the size of the network in terms of line length.
Dassnet	Dassnet Equipment	Supplementary Services	Non-distance sensitive	Data network → equipment with a cost that is not distance-sensitive
Retail - DSL	Retail – DSL	DSL-Retail	Non-distance sensitive	Retail cost → not distance-sensitive
Retail - PSTN/ISDN	Retail - PSTN/ISDN	PSTN/ISDN	Non-distance sensitive	Retail cost → not distance-sensitive
DSL-DSLAM	DSL-DSLAM	DSL-Retail/DSL-Bitstream	Non-distance sensitive	Retail cost → not distance-sensitive
Leased Line - Provisioning	Leased Line – Provisioning	Leased Line	Provisioning	Provisioning activity
Leased Line - Repair	Leased Line - Repair	Leased Line	Non-distance sensitive	As explained by Eir, the costs of "leased lines repair" relates to the repair of customer equipment not length of line.

				→ OK
Repair - Access	Repair - LLU (CMA)-4	UMLP	Distance sensitive	→ OK as the number of faults increases with the distance
Repair - Access	Repair - LLU (Approp)-4	UMLP	Distance sensitive	→ OK as the number of faults increases with the distance
Repair - Access	Repair - LLU (Other)-4	UMLP	Distance sensitive	→ OK as the number of faults increases with the distance
Repair - Access	Repair - Wholesale Other (Other)-4	DSL-Bitstream	Distance sensitive	→ OK as the number of faults increases with the distance
Repair - Access	Repair - PSTN - (Approp)-4	PSTN/ISDN	Distance sensitive	→ OK as the number of faults increases with the distance
Repair - Access	Repair - PSTN Dispatch & Clear (CMA)-4	PSTN/ISDN	Distance sensitive	→ OK as the number of faults increases with the distance
Repair - Access	Repair - ISDN Dispatch & Clear (CMA)-4	PSTN/ISDN	Distance sensitive	→ OK as the number of faults increases with the distance
Subscriber Unit	Subscriber Unit	PSTN/ISDN	Non-distance sensitive	→ Ok as "SU" costs are not distance sensitive
Provisioning - Access	Provisioning - LLU (CMA) Other-4	UMLP	Provisioning	Provisioning activity
Provisioning - Access	CB125-4	UMLP	Provisioning	CB125 - LLU (Co Location) → Provisioning activity
Provisioning - Access	Provisioning - LLU (Approp)-4	UMLP	Provisioning	Provisioning activity
Provisioning - Access	Provisioning - PSTN Access-4	PSTN/ISDN	Provisioning	Provisioning activity

Provisioning - Access	IPC-4	PSTN/ISDN	Provisioning	IPC - Provisioning Control → Provisioning activity
Provisioning - Access	CD101-4	PSTN/WLR	Provisioning	Provisioning activity
Provisioning - Access	Provisioning - ISDN Access-4	PSTN/ISDN	Provisioning	Provisioning activity
Provisioning - Access	Provisioning - DSL-4	DSL-Retail	Provisioning	Provisioning activity
Provisioning - Access	Provisioning - Access Bitstream-4	DSL-Bitstream	Provisioning	Provisioning activity
Provisioning - Retail	Provisioning - CPS WLR-4	WLR	Provisioning	Provisioning activity
Provisioning - Retail	Apparatus Supply	Supplementary Services	Provisioning	Provisioning activity
Provisioning - Retail	DSL (Retail)	DSL-Retail	Provisioning	Provisioning activity
Provisioning - Retail	PSTN CPE Equipment Rental (GL 10658 split) - WLR CPE	PSTN/WLR	Provisioning	Provisioning activity
Data Services	Data - BIP-4	Supplementary Services	Non-distance sensitive	As explained by Eir, this is equipment (routers) that support BIP services. The cost is not dependent on length but on capacity, software, configuration required, etc. Therefore, they are treated as non-distance sensitive. →OK
Data Services	Data - Ethernet-4	Supplementary Services	Non-distance sensitive	This is equipment (routers) that support BIP services. The cost is not dependent on length but on capacity,

				software, configuration required, etc. Therefore, they are treated as non-distance sensitive. →OK
Building Pool	PSTN	PSTN/ISDN	Non-distance sensitive	Related to buildings → non distance sensitive
Building Pool	DSL/BS	DSL-Retail/DSL-Bitstream	Non-distance sensitive	Related to buildings → non distance sensitive
Building Pool	LL	Leased Line	Non-distance sensitive	Related to buildings → non distance sensitive
Building Pool	SUP	Supplementary Services	Non-distance sensitive	Related to buildings → non distance sensitive

Source: Frontier Report, USO Model Documentation 2015/16, Table 14 p54

5.2.6. Cost Curves for Core Network

CVR is the curve that describes how the cost of the core network changes in relation to call volumes. The CVRs used in the USO Model have been extracted in the main from the latest TD-LRIC model that has been previously used to set regulated interconnection rates and also from BT UK Group model[33].

TERA analysed the examples of CVRs used in the USO Model in eir's 2015/16 USO funding application. TERA's assessment of these is set out below:

- SEC-SWITCH-E10-1312,1314,1316, TERTIARY-SWITCH-1312, 1314, 1316. eir confirmed that it is now assumed that the cost increases linearly between 76% and 100%.

- TERA notes that this CVR is therefore very close to the one used by BT.

  According to the BT model[34], in order to deliver 0% of traffic volume, it is necessary to invest 40% of costs (fixed costs), and in order to deliver 1% of traffic volume, it is necessary to invest 76% of costs. Between 76% and 100% the cost increases rather linearly with the traffic Billing-CDCS-CMA.

- TERA considers that the assumption used in eir's 2015/16 USO Model is correct. Based on this assumption, the cost is equal to zero in 2015/16 and therefore no CVR is needed.

- TERA notes that the CVRs used in eir's 2015/16 USO funding application USO Models are the same as those used in the final 2009/10 USO funding application, which TERA considered reasonable.

TERA considers it reasonable for eir's 2015/16 USO funding application to continue to use CVRs based on the TD-LRIC model and on the BT UK Group model.

[33] BT Group plc Long Run Incremental Cost Model Relationships and Parameters 2011: http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/LongRunIncrementalCostModel2011.pdf

[34] BT Group plc Long Run Incremental Cost Model Relationships and Parameters 2011: http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/LongRunIncrementalCostModel2011.pdf

5.3 Conclusion

TERA has reviewed the cost data information provided by eir and concludes that it is consistent with Decisions 1, 2, 8 and 9 of D04/11 as:

- **HCA costs are adjusted for efficiency (Decision 1)**
- **Relevant CAPEX and OPEX are included (Decision 8)**
- **Only relevant avoidable costs are included (Decisions 1 and 2)**
- **Costs correspond to the services that a commercial operator would not provide (Decision 2)**
- **Required efficiency adjustments have been made (Decision 9)**

6 Area model

6.1 Section Overview

This section reviews eir's 2015/16 USO funding application against the principles and methodologies set out in Decisions 11 and 12 of D04/11, the full text of which is set out below.

> ***Decision 11:*** *Uneconomic areas shall be identified at an MDF level.*

> ***Decision 12:*** *An average depreciation charge for each class of network element (based on an average cost and asset age) shall be developed by geo-types (e.g. urban, sub-urban, rural etc.). The USP may allocate the relevant depreciation charge (as reconcilable to the HCA accounts and taking account of the principle of avoidable costs) for each exchange area based on the asset requirements as determined by the Copper Access Model (as updated or similar modelling tool). The calculation must be sufficiently granular to allocate costs only to those network elements actually used by users who are potentially uneconomic. In making this allocation, the USP should draw on, and be prepared to substantiate its investment profile / decision making, works-orders etc., so as to ensure that the allocation is appropriate (i.e. the USP should satisfy itself that in making an allocation to an MDF area, it has not allocated costs which are not reflective of the USP's investment profile in that MDF area).*

The Area Model calculates the direct net cost of uneconomic areas (i.e. where an area corresponds to one MDF, based on the network structure) and where the avoidable costs are greater than the total revenues foregone. This is consistent with the principle of avoidable costs: where the ability to avoid costs is largely determined by the capability to remove parts of the network that the USP, as a commercial operator, would not have chosen to serve in the absence of the USO.

- TERA's assessment is that the calculated direct net cost of uneconomic areas in the Area Model is €0.45M. This figure reflects the amount eir claimed in its 2015/16 USO funding application. This figure constitutes about 6% of the total direct net cost.

6.2 Area Model Assessment

Chapters 4 and 5 have identified a number of adjustments to the treatment of the revenue and cost input data. For example:

- bigger sample size used in the allocation of revenues to MDFs to give more precision;
- inclusion of OPEX for BIP and Ethernet SANS[35] (over copper) which may potentially lead to some increase in the direct net cost of uneconomic areas;

[35] Storage Area Network

- Inclusion of building pool CAPEX which may potentially lead to some increase in the direct net cost of uneconomic areas.

6.2.1. Methodology

Uneconomic areas are defined at the MDF level by comparing costs with revenue. The cost of these areas is determined as follows:

1. Estimate costs and revenue for each MDF and determine the preliminary list of uneconomic MDFs.
2. Deduct double counted revenue generated by traffic between two uneconomic areas. Reduce traffic towards economic areas from uneconomic areas, repeat until result is stable.
3. Distribute leased line revenues: if they connect economic and uneconomic areas, revenue should be attributed to the uneconomic one.
4. Add replacement revenues (coming from calls made by disconnected subscribers using connections in other areas or of other subscribers).

TERA has not identified any methodological changes in the Area Model for 2015/16 as compared to the 2009/10 USO Model. In summary, the changes in the Area Model direct net cost from 2009/10 to 2015/16 appear to be as a result of the evolution or changes in input data, specifically, revenue data and cost data.

6.2.2. TERA's Assessment of the direct net cost claimed

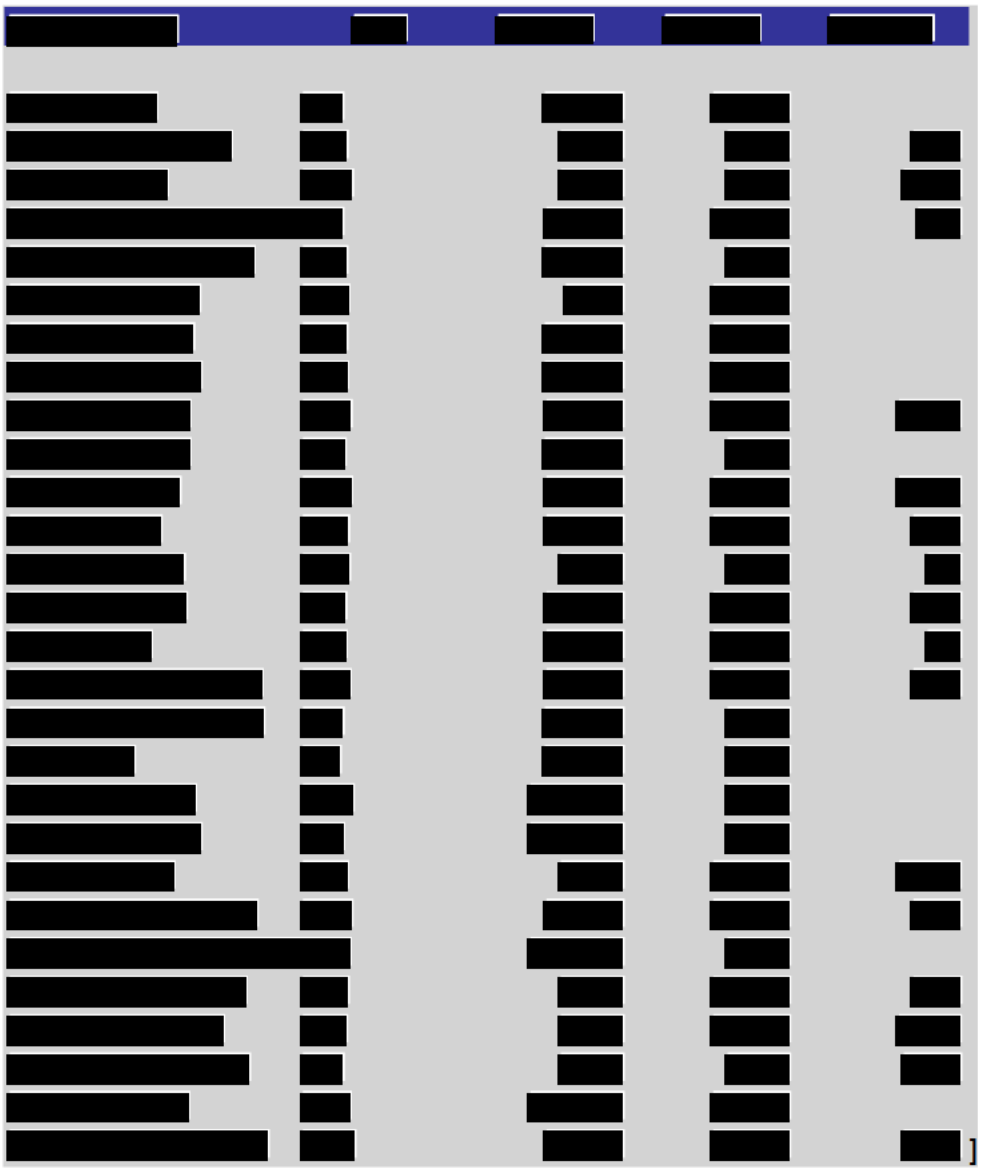
TERA's assessment is that the calculated direct net cost of uneconomic areas is €0.45M. This constitutes about 6% of the total direct net cost.

The number of uneconomic MDFs in 2015/16 is [✂ [redacted]] (out of a total of 1,064 MDFs). Table 7 outlines the direct net cost for each uneconomic MDF in 2015/16. [✂ [redacted]] MDF areas became uneconomic when compared to the data in eir's final 2014/15 USO funding application[36].

Table 7 below summarizes the main evolution between 2014/15 and 2015/16 in terms of direct net cost per uneconomic MDF to assess the impact of the treatment of input data (reviewed in previous section) on the Area Model figures.

[36] Of the [✂ [redacted]] uneconomic areas in 2014/15 (out of 1,064), only [✂ [redacted]] are still uneconomic in 2015/16.

Table 7. Direct net cost assessment for Uneconomic MDFs – difference between assessment in 2014/15 and assessment in 2015/16 for uneconomic MDFs (€) [✂

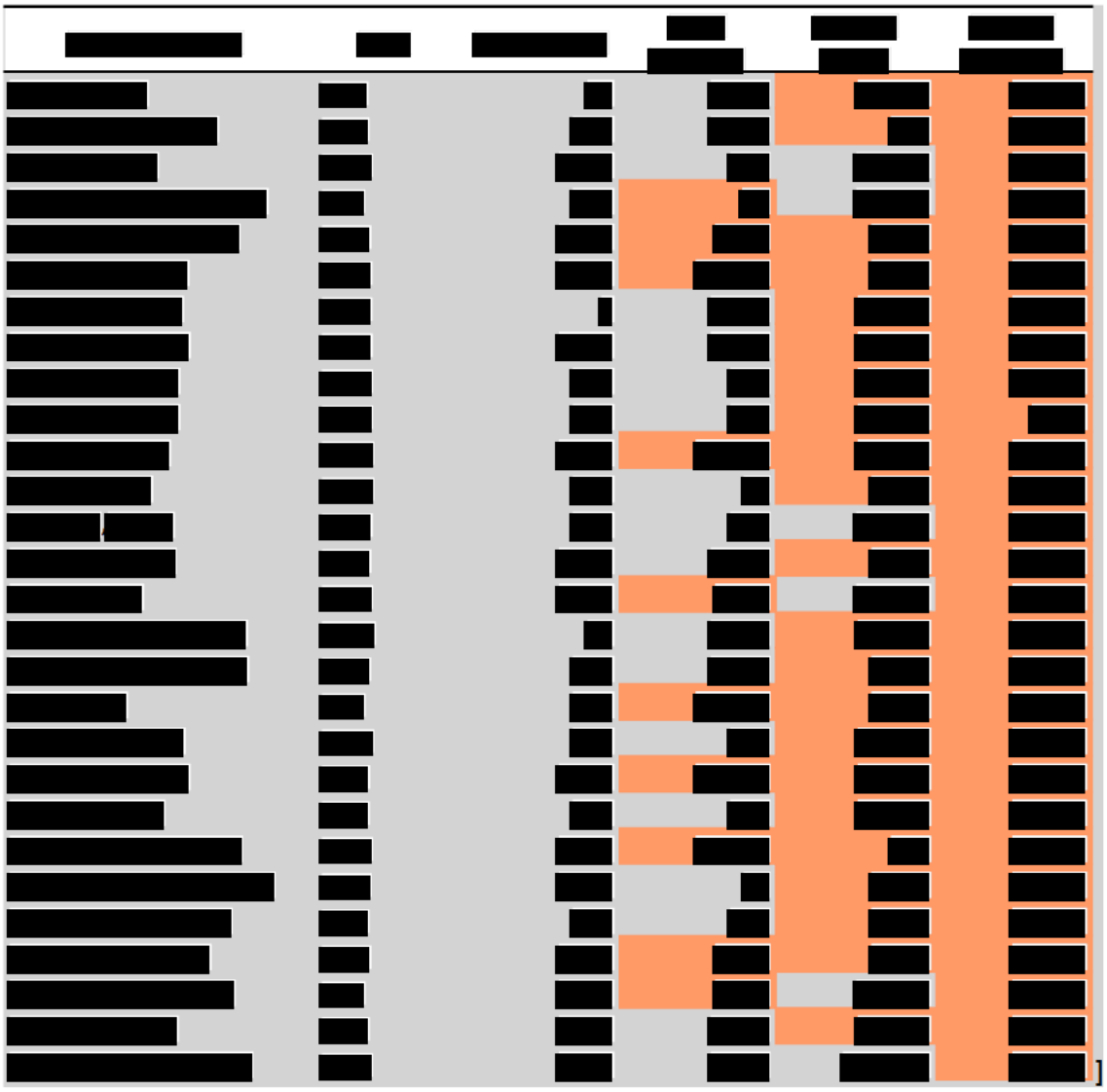


Source: 2014/15 and 2015/16 USO Models, TERA analysis

The USO direct net cost increased in [✂] of the uneconomic MDFs and [✂] new MDF's became uneconomic (compared to eir's final 2014/15 USO funding application (Table 7).

Table 8 shows that the main reason for the direct net cost increase in these MDFs is a general downturn in access revenues and a significant rise in access costs, more specifically in [✂].

Table 8. Change in costs and revenues between assessment in 2014/15 and assessment in 2015/16 for selected MDFs (€) [✂



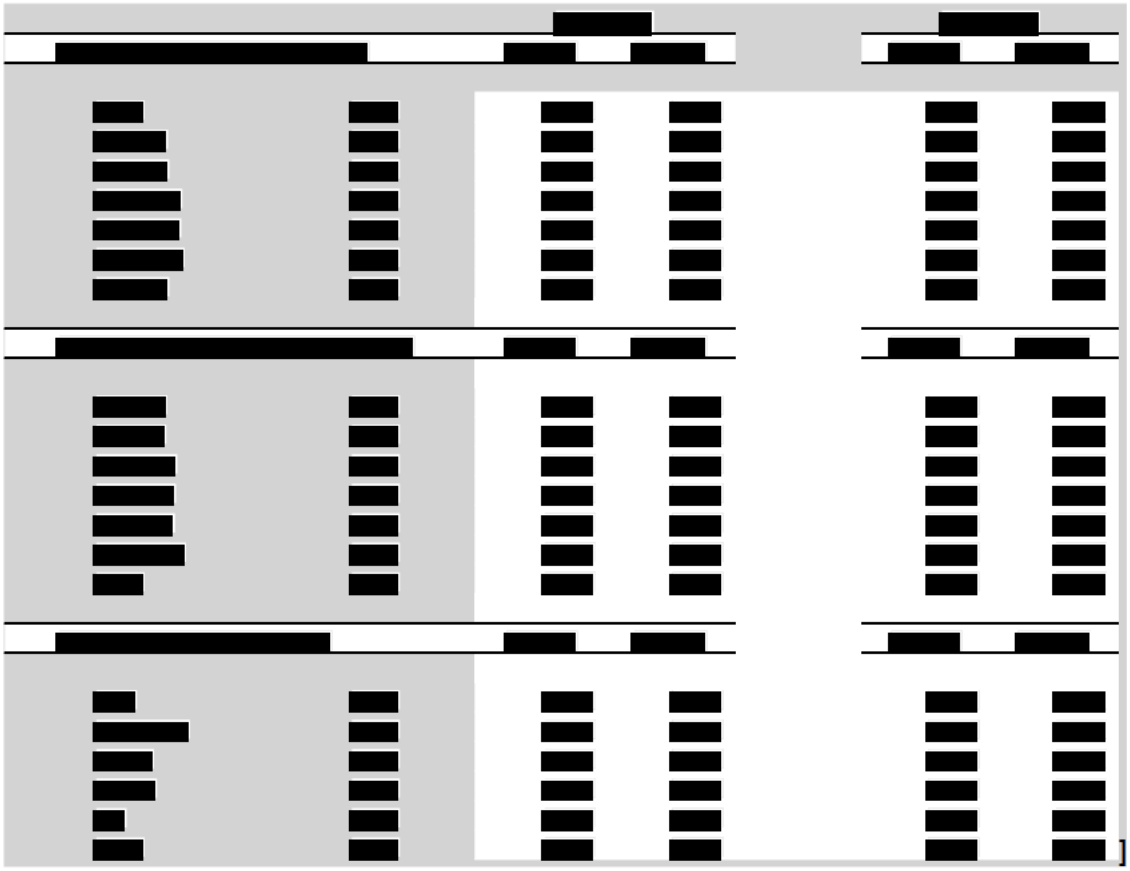
Source: 2014/15 and 2015/16 USO Models, TERA analysis

The variations in the direct net cost of uneconomic areas are mainly explained by the investments made by eir in particular MDFs, and by a higher level of NBV, cost of capital and depreciation.

TERA also sought further information from eir on the drivers that are causing a number of economic MDFs in eir's 2014/15 application to become uneconomic in eir's 2015/16 application. The 2015/16 drivers relate to increases in both overhead copper cable capex and costs related to reactive repair maintenance.

TERA has also studied changes in core costs. [✂ [redacted] demonstrates that unit costs have increased in 2015/16 when compared to 2014/15 .

Table 9. Change in the unit core costs between 2014/15 and 2015/16 [✂



]

Source: 2014/15 and 2015/16 USO Models, TERA analysis

The core unit costs are calculated from the historic costs of the network elements used in the conveyance of calls across the PSTN network, by applying avoidability rates based on CVRs, using a routing matrix which defines usage of network elements, by each service, and volumes of call services. Changes in any of these components can imply a change in the unit core costs.

Accordingly, the changes in the direct net cost of studied MDFs come mainly from changes to the input data, as a result of changes in consumption, routing factors and regulatory accounts, and not from changes in the Area Model itself. TERA has identified no changes in the Area Model itself and confirms that the calculations are performed correctly.

6.3 Conclusion

TERA has reviewed the Area Model and concludes that the calculations are performed correctly and are consistent with the methodological approach set out in D04/11, in particular Decisions 11 and 12.

There were no methodological changes in 2015/16 when compared to eir's final 2014/15 USO funding application and the only changes in direct net cost calculation as compared to eir's 2009/10 USO funding application relate to the treatment of input data, which are external to the model and due to changes in:

- **structure of regulatory accounts**
- **routing factors**
- **mapping of services**

7 Customer Model

7.1 Section Overview

This section reviews the Customer Model element of eir's 2015/16 USO funding application to check that it is in accordance with Decisions 10, 12, 13, 14 and 25 of D04/11.

TERA's assessment is that the calculated direct net cost of uneconomic customers in the Customer Model is €6.3M. This constitutes 84% of the total direct net cost claimed by eir after adjustment by TERA.

The full text of the relevant decisions is set out below:

> ***Decision 10:*** *The net cost calculation shall not include those customers who were originally considered "uneconomic" but who have now become profitable. The net cost calculation also does not include those customers attained as a direct result of a competitive tendering process (who are deemed "uneconomic").*

> ***Decision 12:*** *An average depreciation charge for each class of network element (based on an average cost and asset age) shall be developed by geo-types (e.g. urban, sub-urban, rural etc.).*
>
> *The USP may allocate the relevant depreciation charge (as reconcilable to the HCA accounts and taking account of the principle of avoidable costs) for each exchange area based on the asset requirements as determined by the Copper Access Model (as updated or similar modelling tool).*
>
> *The calculation must be sufficiently granular to allocate costs only to those network elements actually used by users who are potentially uneconomic. In making this allocation, the USP should draw on, and be prepared to substantiate its investment profile / decision making, works-orders etc., so as to ensure that the allocation is appropriate (i.e. the USP should satisfy itself that in making an allocation to an MDF area, it has not allocated costs which are not reflective of the USP's investment profile in that MDF area).*

> ***Decision 13:*** *Uneconomic customers in economic areas shall be identified based on universal account numbers ("UANs"). However, if ComReg is satisfied, because of a lack of information beyond the control of the USP, that it is not practicable to identify uneconomic customers by UAN, the USP must demonstrate that the use of an alternative approach has the equivalent effect of identifying those customers.*

> ***Decision 14:*** *The USP may calculate uneconomic customers in economic areas using a probability analysis. However, the identification and allocation of these costs must be consistent with ComReg's decision outlined in Decision No. 12.*
>
> *The parameters and assumptions used in the probability analysis must be clearly documented and duly reasoned as to the circumstances why the USP considers the customer uneconomic.*

Decision 25: *Applications shall, with reference to the supporting model clearly identify (by MDF or by geographic location as appropriate), with adequate reasoning and cogent evidence to justify that, those customers or groups of customers (i.e. area), that in the absence of the USO, the provision of the service would either not continue to be provided or would never have been provided, to that customer or groups of customers (i.e. area) by a commercial operator, or by the USP acting as a commercial operator. The USP must provide its commercial reasoning, including the respective parameters used in justifying its decision, including, but not limited to:*

- *The current loss-making status of those customers or areas;*
- *The local density of those customers or areas;*
- *The respective distances from exchange for uneconomic customers;*
- *The network infrastructure / technology used to serve those customers or areas; and*
- *Any other pertinent information the USP has used to influence its decision making process.*

Furthermore, applications must not include those customers attained through a competitive tendering process, or those customers which have now become economic, but who were previously considered uneconomic.

7.2 Customer Model Assessment

As stated above, Decision 13 of D04/11 requires the calculation of the direct net cost for each individual uneconomic customer in economic areas "*to be identified based on universal account numbers ("UANs")".*

However, Decision 13 also states that where, due to *"a lack of information beyond the control of the USP*", it is "*not practicable to identify uneconomic customers by UAN, the USP must demonstrate that the use of an alternative approach has the equivalent effect of identifying those customers."* In other words, an objectively justified alternative approach to this calculation is acceptable, such as a "probabilistic approach" (as outlined in Decision 14 of D04/11).

7.2.1. Methodology

In eir's 2015/16 USO funding application, a probabilistic approach rather than an approach based on UAN is used to determine which customers are uneconomic. This probabilistic approach is consistent with the approach used in eir's final 2014/15 USO funding application.

eir is of the view that an approach based on UAN cannot be implemented because uneconomic customers in economic areas cannot be identified based on UANs or by using any other identification number. The UAN identifies only customers' accounts, but one account may have several lines, lines may move between accounts for example as a result of switching between eir retail and eir wholesale. It is more relevant to identify uneconomic customers by the uneconomic lines than to use the customer account. In

order to populate the model with the data on the revenue distribution, eir has therefore used a combination of STD[37] codes and telephone numbers.

eir has indicated that changing from the probabilistic approach is impossible for its 2015/16 USO funding application due to a lack of required data. According to eir there is no available data on line length measurements for each individual customer. eir states that it is therefore impossible to identify each individual customer's associated revenue and line length cost, and that it is therefore impossible to match revenue and cost data for each customer.

This means that the net cost is not calculated for each individual customer, rather it is based on the probability of a customer being uneconomic, and the corresponding expected net cost.

The main assumption of this approach is that the expected revenue of a customer does not depend on the customer's line length (and hence does not affect the customer's cost). Indeed, the telecoms service that a customer decides to choose and the services he or she uses generally do not depend on the length of their lines.

The approach is implemented by eir in several steps:

- For each MDF, the distribution of customers is calculated over the access cost intervals (for example number of customers whose line costs between €5 and €6) and the net revenue intervals (for example number of customers who pay between €5 and €6);
- For a customer in each net revenue interval, the probability of the customer being uneconomic is calculated: it is calculated by comparing the revenue with the cost distribution. It decreases as the revenue increases: for example, if the revenue of this revenue interval is below cost for all the lines in this MDF, then the probability a line in this revenue interval is uneconomic is equal to 100%.
- Multiplying the probability calculated by the number of customers gives the number of uneconomic customers.
- The expected direct net cost per uneconomic customer for a given revenue interval is estimated as the difference between revenue and the average expected cost for uneconomic customers.

In TERA's view the probabilistic approach adopted by eir is reasonable, absent the availability of more granular line length data that would enable eir to establish individual customer line revenues.

TERA is of the view that the probabilistic approach is consistent with the requirements of Decision 13 as the alternative proposed by eir has the equivalent effect of identifying uneconomic customers in economic areas. It is also in line with Decision 12 as a customer's anticipated revenue isn't correlated to geotype. Moreover, TERA is of the

[37] Subscriber Trunk Dialling

view that the parameters and assumptions used by eir in the probability approach are clearly documented and reasoned, as required by Decision 14.

Moreover, TERA is also of the view that following this approach, eir did not include customers who were considered uneconomic but who became economic. Thus, this approach is in line with Decision 10.

TERA's view is based on the following considerations

- UAN relates to a customer's account and not the number of lines on the account and it would not reflect line movement at the customer account level.
- The difficulty in matching revenue and line length information (e.g. where the customer physically moves location and their account changes).
- eir has shown that expected customer revenues and line length costs are not correlated, in other words, there is insufficient data to match individual customer revenue to line length costs.

TERA concludes that the probabilistic approach adopted by eir is reasonable, absent the availability of more granular line length data that would enable eir to establish individual customer line revenues. TERA is of the view that eir's identification of uneconomic customers and its probabilistic approach is in accordance with Decisions 10, 12,13, 14 and 25.

7.2.2. TERA's Assessment of the direct net cost claimed

eir has used a mixture of both the 2009 CAM and the 2016 CAM in its 2015/16 USO Customer Model.

The Frontier Report[38], submitted as part of eir's 2015-16 USO Funding Application describes on page 63 (footnote 38) how eir has used the 2016 CAM in its 2015-2016 USO funding application.

[✂ [redacted] .]

[38] "USO Model documentation – 2015/16: A report prepared for eir", March 2017

eir has used the 2016 CAM model to produce the cost avoidability inputs it has used in the 2015/16 USO Customer Model. These refer, in particular, to (a) the border of the housing area and (b) the split of costs (capex) between housing areas and isolated areas, by underground/overhead network.

eir has used the 2009 CAM (maintained at the FY 2013/2014 level) to calculate the level of avoidability of capex within isolated areas, based on the following assumptions:

- that 'urban areas' in the 2016 Copper Access Model are a good proxy of 'housing areas' in the 2009 Copper Access Model; and
- that 'rural areas' in the 2016 CAM are a good proxy of 'isolated housing areas' in the 2009 CAM.

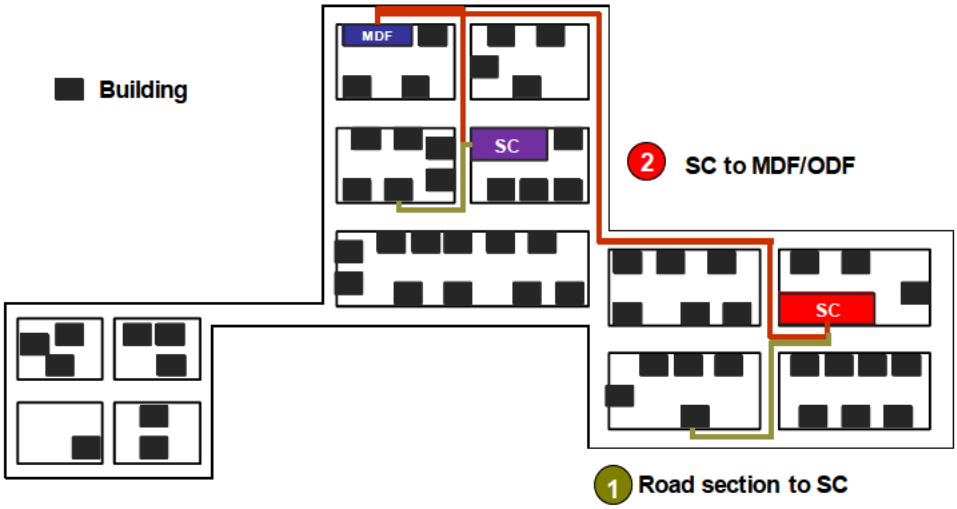
TERA considers that the mixed use by eir of the 2016 CAM with elements of the 2009 CAM in eir's 2015-2016 USO funding application is incorrect. TERA note in particular the eir's allocation costs based on the "Urban/Rural" classifications in the 2016 CAM to the "Housing/Isolated Areas" classifications in the 2009 CAM, is incorrect as these two classifications are not the same and not directly substitutable. It creates an inconsistency in the cost avoidability and cost distribution assumptions used in the USO Customer Model, which materially misestimates the total net cost of uneconomic customers in economic areas, and in turn affects the accuracy of the direct net cost calculation for the financial year 2015-2016.

TERA's considers that it is appropriate for eir's 2015-16 funding application to use the 2016 CAM. .TERA shared with eir a preliminary methodology (similar to the methodology now proposed below) which used the 2016 CAM. ComReg requested TERA to develop the **preliminary ComReg methodology** on how the 2016 CAM could be applied to future USO funding applications.

The **preliminary ComReg methodology** is based on the following 2016 CAM assumptions (see Figure 10):

- the route of the access network is closely aligned to that of the road network.
- the access network may be divided into a number of 'sections', where each 'section' relates to that portion of road network and associated premises which are located between two or more different intersections (i.e. where a road branches/meets another road).
- all access lines within each 'section' are assumed to have the same cost.
- each line within a 'section' is assumed to have the shortest possible path to the relevant street cabinet

Figure 10 –Schematic example of access topology



SC – Street Cabinet
Source: TERA Consultants

Accordingly, the cost of a line is dependent on two factors **(L and N)** which are used to define a distribution key for costs:

- **L** - The length of an access line – i.e. the longer the line, the more expensive the line will be, due to additional civil work and cost of materials; and
- **N** - The number of access lines that follow the same path – i.e. the more access lines that share the same overhead or underground path will result in a lower cost per individual access line due to overhead and/or underground infrastructure sharing.

The 2016 CAM is then used to determine the **L/N** factor by extracting:

- the number of lines and lengths to the Street Cabinet (SC)
- the number of lines and lengths from the Street Cabinet to the main distribution frame (MDF)

where **L** = distance from the section to the street cabinet (SC) + distance from the SC to MDF; and **N** = number of lines.

For each MDF, each section is ranked according to the **L/N** factor. The higher the **L/N** factor, the more expensive the line is. The cost per line per MDF is determined for each 1% of lines selected.

Accordingly, the incremental cost of including an area can be calculated.

In 2019 ComReg instructed TERA to propose a methodology (the **proposed ComReg methodology**) based on the sole use of the 2016 CAM, that could be applied to the calculation of the cost avoidability in the Customer Model of eir's 2015-2016 USO funding application, taking into account, eir's identified "areas for

development[39]" (based on the preliminary ComReg methodology) for calculating cost avoidability in the Customer Model.

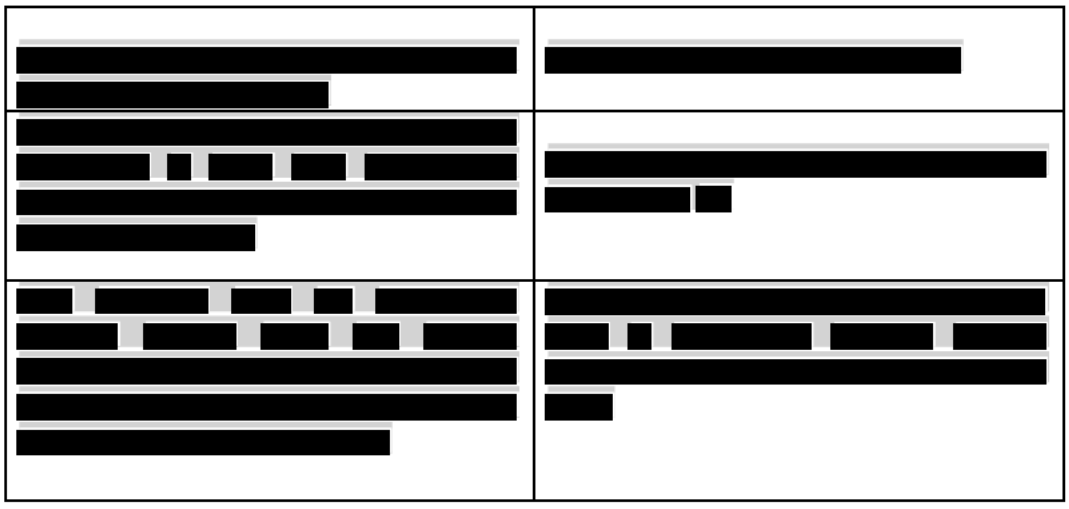
The **proposed ComReg methodology** is based on making a number of changes to the ADC Customer Model element of eir's 2015-2016 USO funding application. These changes reflect the sole use of the 2016 CAM (eir's 2015-2016 Customer Model), by:

- identifying "urban/high density areas" using the "distance from the exchange" (boundary) methodology, where the boundary is defined as 3km[40] from the exchange (MDF).
- applying a refined **L/N** methodology (proxy boundary approach) for access lines beyond 3km from the MDF; and
- amending the Access part of eir's Customer Model by using the incremental inventories generated from the 2016 CAM (Microsoft Access part) as an input into the 2016 CAM (Microsoft Excel part), to generate cost avoidability curves.

This proxy boundary approach (3km) has been used previously by ComReg for similar wholesale access products and component products (e.g. in developing wholesale broadband pricing models[41] where VDSL specific local loop unbundling (LLU) and sub-loop unbundling (SLU) cost inputs have been defined, where the maximum line length is now set at 1.5 km for SLU (from 2.5km) and for 3kms for LLU (from 5km) (ComReg Decision D11/18).

The proposed ComReg methodology notes eir's statement that the preliminary ComReg methodology was *"a valid starting point"* takes into consideration and addresses the eir identified "areas for development".

[✂

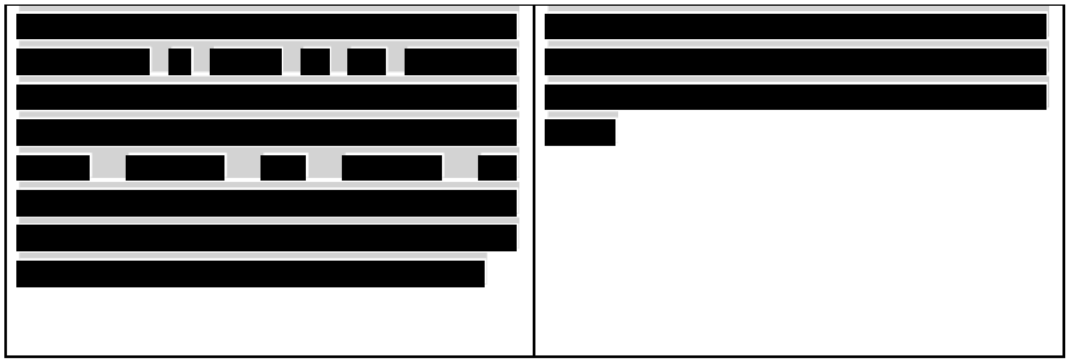


[39] As set out in eir's presentation "eir proposed methodology for calculating cost avoidability in the Customer Model 23/3/18

[40] This approach was employed in ComReg Decision D11/18 in developing wholesale broadband pricing models where VDSL specific local loop unbundling (LLU) and sub-loop unbundling (SLU) cost inputs have been defined, where the maximum line length is now set at 1.5 km for SLU and 3km for LLU" to ensure consistency

[41] This proxy is aligned with that used to develop the wholesale broadband pricing in ComReg Decision D11/18 "Pricing of Wholesale Broadband Services in the WLA and WCA Markets" decision D11/18

[42] represents the difference in costs between Underground and Overhead deployments.



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TERA has calculated the cost curves using the 2016 CAM (i.e. generating 100 incremental inventories; each incremental inventory corresponds to a percentile of lines (i.e. 1%, 2%, 3% … until 100%, which represents the whole network modelled in the 2016 CAM following a scorched node approach) where:

- Lines within a 3km footprint of a MDF are considered by TERA to be an appropriate approximation to the urban/high density categorisation (as set out above). A refined L/N methodology is then applied by TERA for lines beyond 3km[43]. This 3km boundary serves as a proxy. All lines/customers within the boundary are considered unavoidable.
- Lines beyond the boundary are then ranked by percentiles from the most economic to the least economic, using a refined L/N formula (set out below). This formula calculates a score for each road section[44] (beyond the boundary). For underground sections, the intermediate score per section is multiplied by an underground "UG factor" of 6 that represents the difference in costs between underground and overhead deployments. The score per line is then obtained by adding the scores of all the sections used by each line.
    - The L/N formula is as follows:

$$Score = \sum_{uplink\ sections} \frac{Length\ of\ the\ section * UG\ factor}{Number\ of\ local + distribution\ lines\ using\ this\ section}$$

- Lines beyond the boundary are ranked by percentile. TERA used the Microsoft Access section of the 2016 CAM to calculate "incremental inventories"[45].

43 VDSL specific LLU and SLU cost inputs have been defined, where the maximum line length is now set at 1.5 km for SLU (from 2.5km) and for 3kms for LLU (from 5km) (ComReg Decision D11/18).

44 In the 2016 CAM, the term "section" refers to a part of a road/street between two consecutive cross road/street. Buildings (and thus lines) are associated to the network sections, and thus ranking sections is equivalent to ranking lines.

45 An increment is an additional percentile of lines. An incremental inventory therefore refers to the quantities of assets required to deploy the related increment.

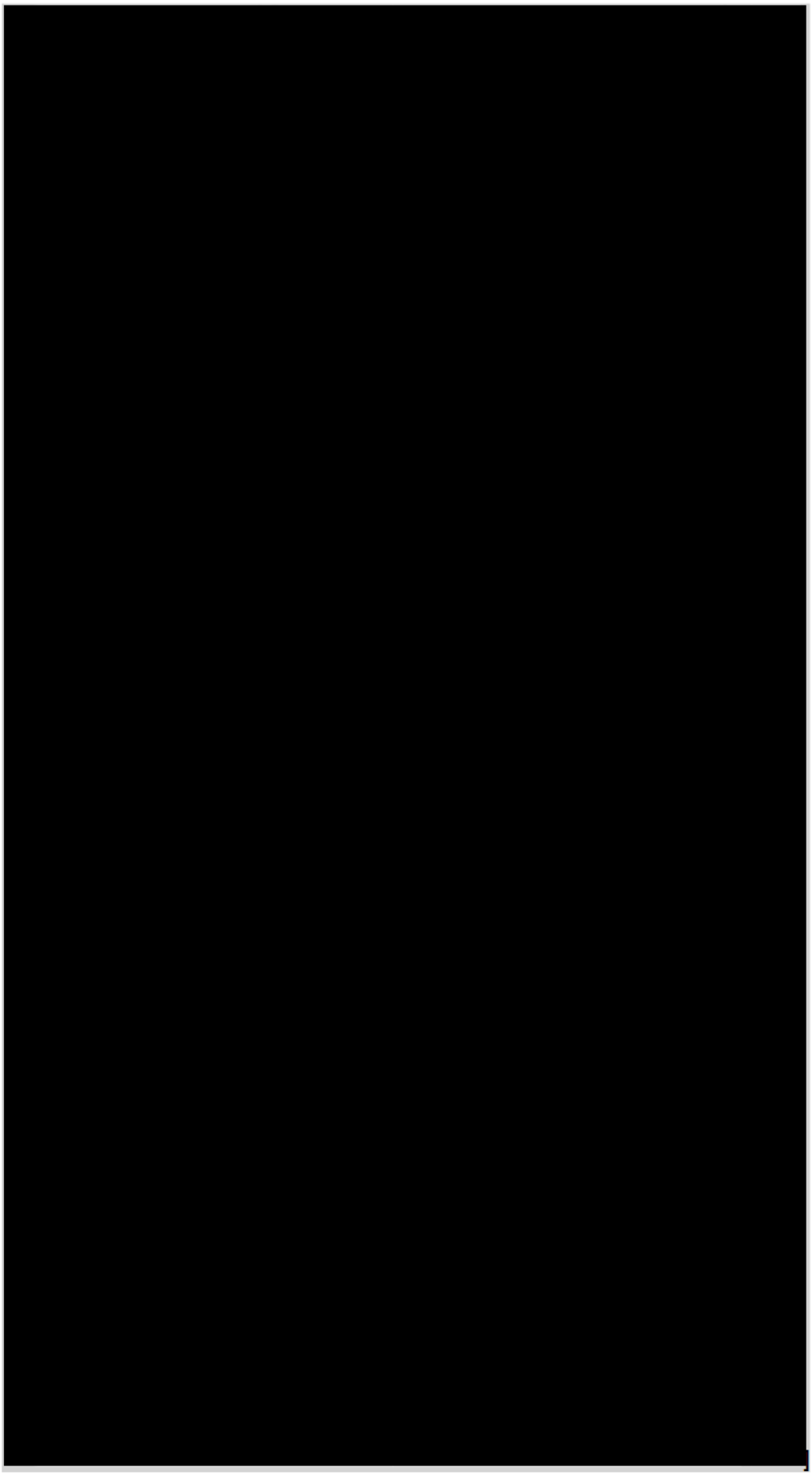
- The Microsoft Access section of the 2016 CAM generates 100 incremental inventories; each incremental inventory corresponds to a percentile of lines (i.e. 1%, 2%, 3% … until 100%, which represents the whole network modelled in the 2016 CAM following a scorched node approach). The iterative nature of these calculations results in a very large series of model outputs (in excess of 200GB).

Accordingly TERA has generated cost curves, using the 2016 CAM, and provided the output of these calculations[46] (i.e. the cost curves) as the input to Workbook A (TERA Adjusted Customer Model - Access part) in the model (given the iterative nature and size of this modelling).

[✂ [redacted]]

[46] The output was provided to eir given the iterative nature of these calculations results in a very large series of model outputs (in excess of 200GB).

[✂



TERA has applied the proposed ComReg methodology to the Customer Model of eir's 2015-2016 USO funding application submission and has made a downward adjustment to eir's 2015-2016 Customer Model of €5,681,354.

The total Net Cost of Uneconomic Customers in Economic Areas has been calculated at €6,289,628 (as compared to the figure of €11,970,982 claimed by eir in the 2015-2016 application as submitted to ComReg).

7.3 Conclusion

TERA considers that eir's use of the 2016 CAM in its 2015/16 USO funding application is inappropriate, and in particular, its mixed use with elements of the 2009 CAM is incorrect. TERA notes in particular that eir's allocation of costs based on the "Urban/Rural" classifications in the 2016 CAM to the "Housing/Isolated Areas" classifications in the 2009 CAM, is incorrect as these two classifications are not the same and are not directly substitutable.

TERA is of the view that the TERA adjustment to Customer Model (reflecting the 2016 CAM) is appropriate and in accordance with the requirements of D04/11, in particular Decisions 12, 13, 14 and 25.

8 Payphone Model

8.1 Section Overview

This section reviews the Payphone Model in eir's 2015/16 USO funding application to check that it is in accordance with Decision 16 and 27 of D04/11.

> ***Decision 16:*** *In respect of mandatory public payphone provision, the net cost calculation shall be based on the total avoidable cost, minus the total revenues foregone. Furthermore, for each public payphone that is connected to a single exchange site, the access cost for a payphone will be the same access cost as that of any line at the exchange site on which it is connected. The avoidable access costs shall be calculated as an estimate per line at the exchange site to which the public payphone is connected. If the number of uneconomic payphones is considered excessive and unreasonable, ComReg may adjust the net cost calculation to reflect appropriate payphone coverage (in areas where they are mandatory).*

> ***Decision 27:*** *With respect to the provision of public payphones which are "uneconomic", sufficient detail shall be provided on their geographic location and proximity of other public payphones operated by the USP (irrespective of their profitability).*

TERA's assessment is that the calculated direct net cost of the Payphone Model is €22,929.

8.2 Payphone Model Assessment

8.2.1. Methodology

The Payphone Model calculates the cost to eir of providing uneconomic payphones in economic areas. Only those payphones that are subject to USO obligations may be considered as part of the USO net cost. For each USO payphone, the corresponding cost and revenue is calculated.[47]

The costs include: access costs of the phone line and of WIFI (where relevant, considered to be already captured in the BSA line costs), core cost, cost of printing and selling phone cards, and the cost of payphone maintenance.

The revenues include: all the revenues from the payphone calls, including national and international, WIFI revenue and on TERA's recommendation to eir, any associated payphone advertisement revenue.

The Area Model and changes in the treatment of data, as outlined earlier in this report, impact the Payphone Model as it uses inputs from the Area Model (i.e. average costs per line in an MDF, and whether an MDF is economic or uneconomic).

The Payphone Model has a total of [✂] payphones, 1,086 of which are USO payphones (i.e. payphones with unrestricted access, as opposed to payphones on

[47] References to "payphones" in this report are to "USO payphones" unless otherwise stated.

private premises). eir in its 2015/16 USO funding application has included the direct net cost of [✂] uneconomic USO payphones.

In eir's 2015/16 USO funding application, the USO Payphones direct net cost is €383,260.

An adjustment has been made by TERA in its assessment of the Payphone Model relating to advertising revenue. The Payphone Model calculates the net cost of uneconomic payphones both, excluding advertising revenue and including advertising revenue. The inclusion of advertising revenues leads to a slightly lower direct net cost and a slightly lower number of uneconomic payphones.

As advertisement revenue is a revenue that wouldn't be obtained by eir in the absence of its provision and service of uneconomic payphones, it is necessary to include this revenue in the direct net cost.

eir chose to exclude the advertising revenue in eir's 2015/16 USO funding application. TERA considered that eir's approach was incorrect and TERA has included this revenue in the Payphone Model which amounts to €106,715.[48]

This adjustment led to a decrease in the calculated direct net cost of the Payphone Model from €383,260 to €276,545 and a decrease in the number of uneconomic payphones in economic areas from [✂] to [✂].

A further adjustment was necessary to take into account ComReg's USO payphone decision in place (Decision D08/14)[49] and, on that basis, to exclude the net cost of a number of payphones [✂] that could have been avoided based on ComReg's Payphone 'Removal Policy'. This led to a decrease of €253,616 in the calculated direct net cost of the Payphone Model to €22,929.

8.2.2. Movement from 2014/15 to 2015/16

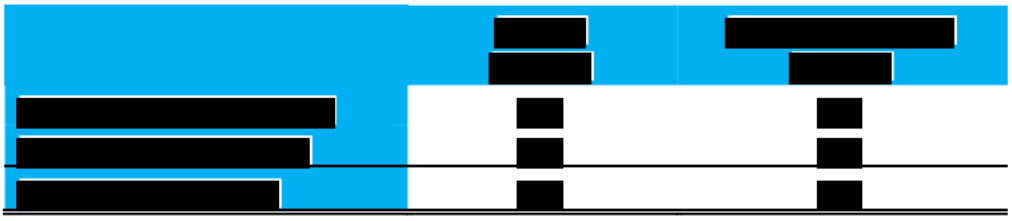
ComReg's assessment of the Payphone Model of eir's 2014-15 USO funding application Decision (D09/19), established that there were 336 USO payphones, of which [✂] were economic, and [✂] were uneconomic. ComReg was of the view that eir had included additional costs associated with payphones which were avoidable [✂] and therefore decided to adjust the Payphone Model direct net cost downwards.

TERA's assessment of the Payphone Model of eir's 2015-16 USO funding application established that there were [✂] USO payphones, of which [✂] were economic, and [✂] were uneconomic, as illustrated in 12 below.

[48] eir confirmed to ComReg by email in May 2017 that it would not disagree with ComReg's decision to include these advertising revenues in the Payphones Model for 2015/16

[49] ComReg (2014), 'Provision of Public Payphones, Universal Service: Scope and Designation', Response to Consultation and Decision, 14/69, 7 July, p.33.

Table 12. Comparison of economic and uneconomic payphones between 2014/15 and 2015/15 [✂



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Source: TERA Consultants

TERA is of the view that eir has included additional costs associated with payphones which were avoidable [✂] following ComReg's Payphone 'Removal Policy' and a further downward adjustment of the 2015-16 Payphone Model direct net cost is required.

8.2.3. TERA's assessment of the direct net cost claimed

TERA's assessment of the calculated direct net cost of uneconomic payphones resulted in a number of reductions to the direct net cost claimed of €383,260, in eir's 2015/16 USO funding application, to a final estimate of €22,929.

TERA has checked for consistency between the results of the Payphone Model and the calculations of the intangible marketing benefit related to payphones, and the results are presented in section 11.4.3. of this report.

eir in its 2015/16 USO funding application has included the direct net cost of [✂ [50]] uneconomic payphones in economic areas (out of a total of 1,086 USO payphones).

Decision 16 of D04/11 sets out that only the net cost of mandatory public payphone provision is relevant to the assessment of the USO funding application. Decision 16 states (emphasis added):

> *"In respect of mandatory public payphone provision, the net cost calculation shall be based on the* ***total avoidable cost****, minus the total revenues foregone. Furthermore, for each public payphone that is connected to a single exchange site, the access cost for a payphone will be the same access cost as that of any line at the exchange site on which it is connected. The avoidable access costs shall be calculated as an estimate per line at the exchange site to which the public payphone is connected.* ***If the number of uneconomic payphones is considered excessive and unreasonable, ComReg may adjust the net cost calculation*** *to reflect appropriate payphone coverage (in areas where they are mandatory).*"

The Payphone Model records that eir removed 13 payphones during 2015/16. In this regard, the Frontier Report states that:

[50] As described in section 8.2.1 above, this figure was adjusted downward by TERA to [✂] .

"In 2009, eir proposed to remove [✂ [redacted]] uneconomic payphones, but objections were made regarding [✂ [redacted]] sites. Therefore [✂ [redacted]] were removed. Most of these were removed before the start of the 2009/10 financial year. Since July 2011, the number of publicly managed payphones has decreased to [✂ [redacted]] in July 2016. As such eir believe a level of payphone deployment has been reached that is not excessive.[51]"

TERA notes that, under Decision 16 of D04/11, ComReg may, if necessary, make an adjustment to eir's direct net cost of fulfilling its USO payphone obligations for 2015/16.[52] Having regard to revenue foregone, any such adjustment could exclude costs which, in ComReg's view eir could have avoided, and which should not, therefore, form part of the calculated direct net cost of the Payphone Model. TERA also notes that Decision 16 specifically refers to the possibility that ComReg may adjust the net cost calculation to reflect appropriate payphone coverage, *"[i]f the number of uneconomic payphones is considered excessive and unreasonable"*.

In 2014, ComReg amended eir's Public Payphones USO designation. In particular, the Removal Procedure was revised as follows[53]:

"The USP is permitted to remove a public pay telephone on a single site where:

i. there is demonstrable evidence that the removal of the public pay telephone is necessary as the public pay telephone concerned is a focus for anti-social behaviour; or

ii. the usage in the previous six months of the public pay telephone (while in reasonable working order) has been low, indicating an absence of "reasonable need" in that location, where "low" is considered to mean:

- *Average Usage (including local, national, international, emergency calls, DQ calls, Freephone calls and reverse charge minutes) for the previous six months is less than 1 minute per day and*
- *Average minutes for the previous six months to Freephone numbers and Emergency Services combined is not more than 30 seconds of these minutes;*

Or,

iii. there is more than 1 public pay telephone on the site and the average usage across all of the public pay telephones on the single site does not meet the low usage standards as set out in 4.1(ii); in such instances the USP shall ensure 1 public pay telephone remains on the single site; or

iv. *it is requested by a local authority*

Based on the 2015/16 Payphone Model inputs, an analysis has been performed by TERA to determine, having regard to Decision D08/14, the number of payphones that are appropriate for inclusion in the direct net cost Payphone Model of 2015/16, and the

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[51] Frontier Report, page 129.

[52] Eir was designated to provide public payphones for the period from July 2014 to June 2018 in ComReg D08/14 "*Universal Service – Provision of Public Payphones: Review of Usage Threshold for Removals*", ComReg Document 16/43, Decision 08/14.

[53] Decision D08/14, File ComReg 14/69, July 7th 2014

potential impact this may have on the direct net cost of the Payphone Model within eir's 2015/16 USO funding application.

First, TERA disregarded the cost of [✂] payphones that were no longer considered as USO payphones in 2014/15 based on above criteria.

Only criteria (ii) and (iii), as per the decision (D08/14) above, could be analysed based on information in the USO payphone model.

eir's 2015/16 USO funding application payphone model did not identify and clearly break out the breakdown of calls to freefone numbers and the emergency services. Accordingly ComReg requested eir to provide the relevant breakdown for each payphone, which eir provided.

TERA Consultants has analysed the level of adjustment that could have been made based on:

- average usage is less to 1 min per day for a rolling 6-months period (i.e. Month 1 =January 2015 (Revenue distribution per months and per payphone as per the worksheet "I-Revenue" was used to find the monthly usage distribution as this is not included in eir's model and revenues are directly linked to the usage)
- Average freephone calls usage is less than 30 seconds per day for a rolling 6-months period starting January 2015
- Payphone XY-co-ordinates were also used to determine whether a site is Single or Multiple. If the site is Multiple, the Payphone with the most usage is not removed as per criterion (iii).

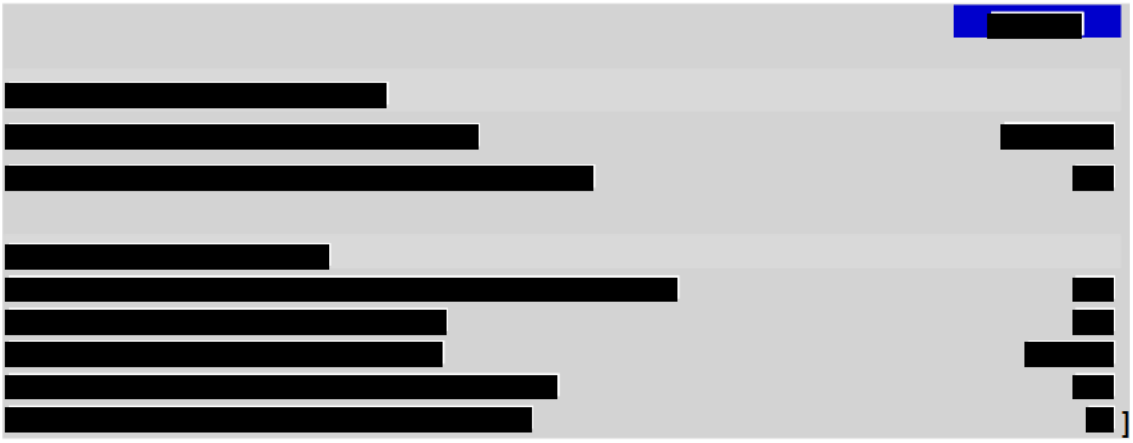
Prior to any public payphone removal, eir is required to post a removal notice for the public payphone at least 8 weeks before the removal. Accordingly 2/12 of the USO payphone model direct net cost for payphones to be removed in 2015/16 is assumed to have been automatically incurred before these payphones could have been removed.

The analysis shows, based on the threshold set out in Decision D08/14 that a total of [✂ [54]] payphones (out of the [✂] claimed by eir), as outlined in Table 13 below, are not allowable as part of the direct net cost within the Payphone Model, the net cost of which could have been avoided by eir in 2015/16. Accordingly, the net cost related to these Payphones have been discounted by the equivalent proportion of months where the payphone should have been removed (i.e. if based on usage scenarios for the 6-month period going from January to December 2015, a Payphone is noticed to be removed in the beginning of July 2016 and set then to be removed 8 weeks after, 2/12 of its direct net cost is disregarded).

This leads to a decrease of the Payphone Model direct USO net cost from €276,545 to €22,929.

[54] [✂] payphones equals the [✂] uneconomic payphones excluded in previous years and the [✂] payphones excluded this year

Table 13 - Adjustments to the USO PP model net cost for 2015-16 [✂



Source: 2015/16 USO models, eir, TERA analysis

8.3 Conclusion

TERA has adjusted eir's 2015/16 USO funding application Payphone Model calculations, leading to a decrease in the calculated direct net cost of the Payphone Model, to €22,929.

TERA is of the view that in respect to the provision of public payphones which are "uneconomic", sufficient detail was provided by eir on their geographic location and proximity of other public payphones operated by eir (irrespective of their profitability) in accordance with D04/11, and in particular Decision 27.

TERA is of the view that following TERA's adjustments of the Payphone Model in eir's 2015/16 USO funding application, the calculations are in accordance with D04/11, and in particular Decision 16.

9 Directories Model

9.1 Section overview

This section reviews the Directories Model element of eir's 2015/16 USO funding application to check that it is in accordance with Decision 17 of D04/11.

> ***Decision 17:*** *For Directories, the net cost calculation shall use the total avoidable cost, minus total revenues of this service.*

TERA's assessment is that the calculated direct net cost of the Directories Model is €680,000.

In 2015/16, eir as USP was required to:

- provide end-users with a comprehensive printed directory of subscribers, free-of-charge, updating it at least once a year.

eir's 2015/16 USO funding application did not include any costs or revenues of the National Directory Database (NDD) in the Directories Model as the maintenance of the NDD was no longer a requirement of the USO.[55]

With regard to the printed telephone directories, eir has sub-contracted its USO under a commercial agreement with FCR Media since June 2002. The commercial relationship applicable for 2015/16 is summarised by TERA as follows (having regard to the Frontier 2015/16 Report):

- A contract between FCR Media and eir dated 23 April 2015, to cover the production of directories for 2015/16 (the "April 2015 contract");
- FCR Media has the sole and exclusive rights to publish the White Pages directories on behalf of eir
- FCR Media has the sole and exclusive right to sell enhancements in the White pages directory and is entitled to retain all such revenues; and
- Eir is entitled to brand positioning on the covers and to a number of pages in the directories.

The costs and revenues flowing from the April 2015 contract are the basis for the calculation of the net cost of the printed telephone directory of subscribers for 2015/16.

eir has claimed a direct net cost for the Directories Model of €0.68M.

[55] On 19 October 2012 by Direction D10/12, ComReg directed eir to continue to maintain the NDD until 30 June 2014 however this was a separate obligation on the USP.

9.2 Directories Model Assessment

9.2.1. Methodology

The Directories Model in eir's 2015/16 USO funding application has shown a loss. eir has claimed that the direct net cost of this USO service is €680,000.

The costs included in the model relate to the printing and distribution costs of directories. Based on information provided by eir, TERA is of the view that the Directories USO direct net cost submitted by eir is correct.

9.2.2. TERA's Assessment of the direct net cost claimed

Following TERA's review of eir's 2015/16 USO funding application, TERA sought further details and a breakdown of the costs in the Directories Model.

TERA sought further clarification from eir to understand the nature of services provided by eir for the 2015/16 period. ComReg requested additional information from eir.

eir provided the following documentation: [✂

- [redacted]
- [redacted]
- [redacted]
- [redacted].]

Based on the documents provided, TERA made its assessment of the direct net cost claimed by eir in respect of the Directories Model.

9.3 Conclusion

TERA is of the view that this assessment is consistent with D04/11 and in particular with Decision 17, TERA's assessment of the direct net cost of the Directories Model for 2015/16 is €680,000.

10 Disabled Users' Services Model

10.1 Section Overview

This section reviews the Disabled Users' Services Model element of eir's 2015/16 USO funding application to check that it is in accordance with Decision 18 of D04/11.

> ***Decision 18:*** *The net cost for the provision of specific USO services for disabled users, shall be calculated using the total avoidable cost minus the associated total revenues foregone. The avoidable cost shall include the cost associated with the provision of USO special services over the standard minimum level of service (e.g. minicom relay services, free directory enquiries, etc) and specialised equipment (e.g. restricted vision phones, inductive couplers, etc) minus the total revenue which is incremental to the total revenue associated with the standard minimum level of service to disabled users (which is appropriate to all operators).*

In 2015/16 eir, as USP, was required to:

- provide a dedicated section of the eir website with information on the services which are of particular interest to people with disabilities
- maintain a Code of Practice concerning the provision of services for people with disabilities
- provide the specific services for users who:
- are hearing impaired,
- are hearing and/or speech impaired;
- have limited dexterity or mobility;
- have restricted vision; and
- are unable to use the phone book due to a disability.

TERA's assessment is that the calculated direct net cost of the Disabled Users' Services Model of eir's 2015/16 USO funding application is €16,336. This figure is the same as the amount eir claimed in its 2015/16 USO funding application.

10.2 Disabled Users' Services Model Assessment

The results of the direct net cost calculation of services for disabled users are presented in Table14.

This obligation comprises the following services provided to disabled users by eir:

- Relay service: Translation of voice message to text and sending of that text to the phone of the customer of the operator and vice versa. In addition to a special rebate (the STEP[56] rebate).
- Special phones provision: Supply of special phones to disabled customers with dedicated features.

[56] Scheme for Text Telephone Equality of Payment is provide to account for the additional time it takes to make a text telephone call compared to an ordinary call.

- Free DQ: eir provide free directory enquires for customers that cannot use the phonebook due to a sensory or physical disability or medical condition.
- Braille Provision: reading bills and provision of bills in Braille.

As shown in Table14 14, the main change in direct net cost between 2014/15 and 2015/16 is attributable to a general decrease of net cost allocated to each service.

Table14. Direct net cost of services provided to disabled users [✂

Source: 2014/15 & 2015/16 Disabled Users' Services Models

10.3 Conclusion

TERA is of the view that the methodology in eir's 2015/16 USO funding application Disabled Users' Services Model is in accordance with Decision 18 of D04/11 and that the calculations are correct for each of the following components:

- Text relay;
- Free directory inquiry; and
- Braille bills; and
- specialised equipment.

TERA is of the view that the above approach of calculating costs and revenues is in accordance with D04/11, in particular with Decision 18.

11 Direct Net Cost Overlap with Intangible Benefits Calculations

This section assesses any potential overlap between direct net cost estimates and intangible benefits estimates to ascertain whether there is any evidence of double counting, the avoidance of which is set out in Decision 36 as a key principle in the identification of benefits.

> ***Decision 36:*** *For the identification of the benefits, ComReg will observe the following key principles:*
>
> *• The benefits represent effects on a USP of providing the USO which have not been accounted for in the direct costing methodology (for example, any benefits that are directly identifiable to specific revenue streams, including indirect and replacement calls revenues are excluded having been covered by the direct net cost calculation).*
>
> *• Avoid the double counting of any benefits.*
>
> *• The benefits are those accruing to the USP, as a consequence of being the designated USP (any benefit arising from the fact that the USP is a large player in the market is to be excluded from the calculations).*

TERA examined each of the four sources of the intangible benefits model, as follows:

- enhanced brand recognition (section11.1),
- ubiquity (section 11.2),
- life cycle benefits (section 11.3),
- and marketing benefit (section 11.4).

TERA checked that the input values for the intangible benefits model are correctly sourced from the direct net cost USO model and correspond to the outputs of that model.

TERA also undertook two main exercises to check for overlaps between the direct net cost estimates and the intangible benefits calculations, as required by D04/11 (Decision 36):

- checked that the intangible benefits are not double counting items already accounted for in the direct net cost USO model; and
- checked that the relevant elements are taken into account, either in the direct net cost USO Model, or in the intangible benefits model.

11.1 Enhanced Brand Recognition

11.1.1. Double counting

TERA assessed whether the methodology used to evaluate the enhanced brand recognition benefit could create any double counting issues.

11.1.2. Inputs used to estimate intangible benefits

The enhanced brand recognition model uses inputs from the Area Model.

The data on the number of lines in economic and uneconomic areas used in the enhanced brand recognition model corresponds to the number of lines extracted from the Area Model (table 15 below).

Table 10. Number of lines used to estimate enhanced brand recognition benefit [✂

Source: Area Model 2015/16

Other inputs – economic/uneconomic indicators of areas, number of services for the financial year, annual revenue from access services, one-off revenue from access services, revenue from core network services, avoidable costs from access services, and avoidable costs from core network services – have also been extracted correctly from the Area Model.

11.1.3. Conclusion

TERA considers that there is no double-counting between the direct net cost USO model and enhanced brand recognition model, and the inputs to the enhanced brand recognition model are extracted correctly.

11.2 Ubiquity

11.2.1. Double counting

TERA assessed whether the methodology used to evaluate the ubiquity benefit could create any double counting issues.

11.2.2. Inputs used to estimate intangible benefits

The ubiquity model uses inputs from the Area Model.

The data on the number of lines in economic and uneconomic areas used in the ubiquity model corresponds to the number of lines extracted from the Area Model (table 16 below).

Table 16. Number of lines used to estimate ubiquity benefit [✂

Source: Area Model 2015/16

Other inputs – economic/uneconomic indicators of areas, number of services for the financial year, annual revenue from access services, one-off revenue from access services, revenue from core network services, avoidable costs from access services, and avoidable costs from core network services – have also been extracted correctly from the Area Model.

11.2.3. Conclusion

TERA is of the view that there is no double-counting between the direct net cost USO model and ubiquity model, and the inputs to the ubiquity model are extracted correctly.

11.3 Life Cycle Benefits

11.3.1. Double counting

Life cycle benefits consist of two components:

1) benefit from uneconomic areas becoming economic,
2) benefit from uneconomic customers becoming economic.

TERA considers that there is no double counting between the direct net cost USO model and the life cycle benefits model.

11.3.2. Inputs used to estimate intangible benefits

eir explains that in order to estimate the benefit related to uneconomic areas the Area Model is run two times: with the life-cycle mark-up benefit parameter equal to 0% and to [✂]. The difference between two results corresponds to the life cycle benefit. TERA has checked how the results of the Area Model change with the change of the parameter (see Table 17 below).

Table 17. An extract from the parameters of the Area Model

Modelling / financial year		2015 / 2016
Currency unit		EUR
Cost of capital	Excel Name: CoC	8,18%
Days in a year		365
Days in a month		30,42
Life-cycle benefit factor		0,00%

Source: 2015/16 Area Model

TERA confirms that the direct net cost of uneconomic areas is equal to €444,959 when the parameter is set to zero and to €444,264 when the parameter is set to [✂] (see table below). The numbers used as inputs for the calculation of life cycle benefits relating to uneconomic areas are therefore correct.

Table 18. Area Model results without and with life cycle mark-up

Estimated net cost from the Area Model (without mark-up)	€ 444,959
Estimated net cost from the Area Model (with mark-up)	€ 444,264

Source: eir's Intangible Benefits Report 2015/16

11.3.3. Conclusion

TERA is of the view that there is no double-counting between the direct net cost USO model and the life cycle model, and the inputs to the life cycle model are extracted correctly from the Area Model.

11.4 Marketing Benefits

11.4.1. Double counting

Marketing benefit is calculated as an intangible advertising benefit that eir derives from corporate branding or logo display on USO payphones.

11.4.2. Inputs used to estimate intangible benefits

As explained in section 8, the number of uneconomic USO payphones is [✂] in 2015/16. The total advertisement revenue from third party advertising on these payphones equals to [✂]. This advertisement revenue is included in the direct net cost.

11.4.3. Conclusion

TERA considers that there is no double-counting between the direct net cost USO model and the intangible marketing benefits model, and the inputs to the marketing benefits model (after calculating the net cost including advertising revenues) are extracted correctly from the Payphone Model.

11.5 Conclusion

The inputs of the intangible benefits models correspond to the outputs of the direct net cost models.

There is no double-counting between the direct net cost USO Models and the intangible benefits models, therefore TERA is of the view that the calculated direct net cost in eir's 2015/16 application is in accordance with the principles set out in Decision 36 of D04/11.

TERA is of the view that the inputs of the intangible benefits model correspond to the outputs of the direct net cost USO models.

TERA is also of the view that there is no double counting between the direct net cost and the intangible benefits, in accordance with Decision 36.

12 Appendix 1: Referenced Decisions in ComReg D04/11 "Costing of universal service obligations: Principles and Methodologies", 31 May 2011

Decision 1

Decision 1: *The HCA methodology, properly adjusted for efficiencies and taking account of the costs that could have been avoided by the USP without having the USO, is the cost methodology that must be used to calculate the net cost of the USO.*

Decision 2

Decision 2: *USO net costs shall be calculated on the basis of "all" capital costs and "all" operating costs that could be avoided on a HCA basis, as if the provision of services to uneconomic customers by a commercial operator was not required under a USO. It is only the portion of costs, both capital and operational expenditure for the given financial year, that can be directly attributed to the USO service (i.e. the service activity creates the cost) and which could have been avoided without the USO, which are included in the net cost calculation.*

Decision 3

Decision 3: *USO revenues shall be calculated on the basis of both the direct and indirect revenues that an operator would forego as a result of ceasing to provide services to uneconomic customers.*

Decision 4

Decision 4: *Direct revenues shall include those revenues which are directly invoiced to a customer for the services provided directly by the USP. They include:*

- *One-off connection charges: where the revenue should be allocated over the expected life of the customer. In circumstances where a line is permanently disconnected, the remaining unallocated one-off connection charges should be allocated to that year of disconnection;*
- *Revenues associated with access (e.g. line rental);*
- *Calls (e.g. local, national, mobile, international, directory enquiries ("DQ") and premium rate services); and*
- *Complementary services, such as, broadband services.*

Decision 5

Decision 5: *Direct revenues shall include those revenues from an OAO (who is indirectly providing the service to the customer) using the USP's wholesale services and include, amongst other things:*

- *Wholesale access (single billing wholesale line rental ("SB-WLR");*
- *Wholesale calls; and*
- *Complementary wholesale services, such as Bitstream and Local Loop Unbundling ("LLU") etc.*

Decision 6

Decision 6: *Indirect revenues shall include those revenues which are not directly invoiced to a customer for the services provided directly by the USP. They include:*

• Wholesale interconnection revenues: fixed termination and transit services as a result of inbound calls from another fixed / mobile networks, where an OAO is invoiced for terminating and transiting a call on the USP network;

• Non-geographic numbers (e.g. 1800, 1850, 11811 and 1890 numbers);

• Economic USO customer calls to an uneconomic customer: firstly, the revenue of the economic customers' calls to uneconomic customers shall be allocated to the uneconomic customer. If the uneconomic customer is now economic, as result of the allocation, then a second stage is required to ensure that this treatment does not make the previously economic customer into an uneconomic customer as a result. If as a result of this second stage the economic customer becomes uneconomic, then it is only that portion of revenue which the economic customer can spare without making themselves uneconomic that should be allocated;

• Leased Lines: where initially all revenues associated with the leased line are allocated to the uneconomic line. If the uneconomic point is now economic, as a result of the allocation, then a second stage is required to ensure that this treatment does not make the previously economic point into an uneconomic point as a result. If as a result of this second stage the economic point becomes uneconomic, then it is only that portion of revenue which the economic point can spare without making themselves uneconomic should be allocated; and

• Replacement calls: where a net cost exists, replacement calls shall be estimated and added to the net cost calculation (but only in circumstances where "uneconomic" areas or customers have been firstly identified as commercially uneconomic).

Decision 7

Decision 7: *Where it is clearly demonstrated that due to a lack of information beyond the control of the USP, that it is not practicable for indirect revenues to be calculated in accordance with Decision No. 6, the USP may use an alternative approach, provided that it is properly supported with reasonable assumptions.*

Decision 8

Decision 8: *The avoidable costs included in the net cost calculation, shall be those costs reflecting the provision of the USO which a commercial operator would not ordinarily have provided, and which were incurred in the most efficient way. These costs shall relate to: (a) the avoidable capital costs associated with CAPEX i.e. depreciation; (b) OPEX; and (c) overheads for the appropriate financial year.*

Decision 9

Decision 9: *ComReg may use a number of methodologies to determine the appropriate level of costs that would have been incurred by an efficient operator, in order to determine the quantum of adjustments necessary to the USP's net cost calculation. These methodologies may include, but are not limited to, the use of:*

- *The review of supporting documentation available, such as: cost-benefit analysis reports; engineering reports; fault reports of geographical areas, and other documents in relation to the business case / investment decisions associated with the network roll-out and upgrade;*
- *A line fault efficiency rate: applying the national LFI target rate (corresponding to the financial year in question) at a regional level (and allowing for appropriately reasoned variances) ;*
- *Independent survey report regarding the USP's efficiency;*
- *Regulatory decisions from other jurisdictions that provide relevant precedents and benchmarks; and*
- *The development of a model to assess the appropriateness of the efficiency adjustment proposed by the USP.*

Decision 10

Decision 10: *The net cost calculation shall not include those customers who were originally considered "uneconomic" but who have now become profitable. The net cost calculation also does not include those customers attained as a direct result of a competitive tendering process (who are deemed "uneconomic").*

Decision 11

Decision 11: *Uneconomic areas shall be identified at an MDF level.*

Decision 12

Decision 12: *An average depreciation charge for each class of network element (based on an average cost and asset age) shall be developed by geo-types (e.g. urban, sub-urban, rural etc.). The USP may allocate the relevant depreciation charge (as reconcilable to the HCA accounts and taking account of the principle of avoidable costs) for each exchange area based on the asset requirements as determined by the Copper Access Model (as updated or similar modelling tool). The calculation must be sufficiently granular to allocate costs only to those network elements actually used by users who are potentially uneconomic. In making this allocation, the USP should draw on, and be prepared to substantiate its investment profile / decision making, works-orders etc., so as to ensure that the allocation is appropriate (i.e. the USP should satisfy itself that in making an allocation to an MDF area, it has not allocated costs which are not reflective of the USP's investment profile in that MDF area).*

Decision 13

Decision 13: *Uneconomic customers in economic areas shall be identified based on universal account numbers ("UANs"). However, if ComReg is satisfied, because of a lack of information beyond the control of the USP, that it is not practicable to identify uneconomic customers by UAN, the USP must demonstrate that the use of an alternative approach has the equivalent effect of identifying those customers.*

Decision 14

Decision 14: *The USP may calculate uneconomic customers in economic areas using a probability analysis. However, the identification and allocation of these costs must be consistent with ComReg's decision outlined in Decision No. 12.*

The parameters and assumptions used in the probability analysis must be clearly documented and duly reasoned as to the circumstances why the USP considers the customer uneconomic.

Decision 15

Decision 15: *During the course of ComReg's assessment of a USO funding application, a number of sample "reality" checks will be undertaken. If material discrepancies are found, ComReg may: require a full assessment for those exchange areas claimed to be uneconomic or include uneconomic customers; apply a proportionate adjustment to the net cost calculation (pre-intangibles); or reject the entire USO funding application (on the basis that the discrepancy is of a magnitude which would render the application not fit for purpose).*

ComReg as part of its assessment process, will reserve the right to further interrogate any rationale provided by the USP in relation to uneconomic areas and uneconomic customers and to undertake its own assessment regarding the appropriateness of these net costs.

Decision 16

Decision 16: *In respect of mandatory public payphone provision, the net cost calculation shall be based on the total avoidable cost, minus the total revenues foregone. Furthermore, for each public payphone that is connected to a single exchange site, the access cost for a payphone will be the same access cost as that of any line at the exchange site on which it is connected. The avoidable access costs shall be calculated as an estimate per line at the exchange site to which the public payphone is connected. If the number of uneconomic payphones is considered excessive and unreasonable, ComReg may adjust the net cost calculation to reflect appropriate payphone coverage (in areas where they are mandatory).*

Decision 17

Decision 17: *For Directories, the net cost calculation shall use the total avoidable cost, minus total revenues of this service.*

Decision 18

Decision 18: *The net cost for the provision of specific USO services for disabled users, shall be calculated using the total avoidable cost minus the associated total revenues foregone. The avoidable cost shall include the cost associated with the provision of USO special services over the standard minimum level of service (e.g. minicom relay services, free directory enquiries, etc) and specialised equipment (e.g. restricted vision phones, inductive couplers, etc) minus the total revenue which is incremental to the total revenue associated with the standard minimum level of service to disabled users (which is appropriate to all operators).*

Decision 19

Decision 19: *USO funding applications shall be consistent and in accordance with this Decision and Decision Instrument.*

Decision 20

Decision 20: *USO funding applications shall be fit for purpose.*

Decision 21

Decision 21: *USO funding applications shall be based on annual information which coincides with the USP's financial year.*

Decision 22

Decision 22: *A declaration shall be signed off by the Board of Directors of the USP and it must accompany the application. (The required declaration is included in Schedule 1). Financial information shall be provided with an appropriate audit opinion or appropriate report, where the Auditor73 (as approved by ComReg) has in no way assisted with the preparation of the USO funding application.*

Decision 23

Decision 23: *USO funding applications shall be supported by calculations in an MS Excel, or MS Access format, or alternative software which is reasonably capable of proper access and review.*

Decision 24

Decision 24: *Any models submitted in support of a USO funding application shall be transparent: there must be limited hard-coded cells (where cells are hard-coded a supporting reference document of such numbers must be provided and be capable of being reconciled and audited) and all numbers must be set out so that there is an audit trail present. The models submitted shall be set out in a clear and transparent manner, showing the separate calculations for each component (e.g. uneconomic areas, uneconomic customers, the provision of public pay telephones and specific services for disabled users). The calculations supplied must clearly set out the capital costs, operating costs, overheads, etc (including General and Administration — ("G&A") costs) and the methods adopted for the allocation of costs which are not directly related to the provision of the USO. Where uneconomic lines/areas are identified, the works orders associated with those areas for the year of assessment must be available upon request by the Auditor as supporting documentation for the USO application.*

Decision 25

Decision 25: *Applications shall, with reference to the supporting model clearly identify (by MDF or by geographic location as appropriate), with adequate reasoning and cogent evidence to justify that, those customers or groups of customers (i.e. area), that in the absence of the USO, the provision of the service would either not continue to be provided or would never have been provided, to that customer or groups of customers (i.e. area) by a commercial operator, or by the USP acting as a commercial operator. The USP must provide its commercial reasoning, including the respective parameters used in justifying its decision, including, but not limited to:*

- *The current loss-making status of those customers or areas;*
- *The local density of those customers or areas;*
- *The respective distances from exchange for uneconomic customers;*
- *The network infrastructure / technology used to serve those customers or areas; and*
- *Any other pertinent information the USP has used to influence its decision making process.*

Furthermore, applications must not include those customers attained through a competitive tendering process, or those customers which have now become economic, but who were previously considered uneconomic.

Decision 26

Decision 26: *There may be a requirement to make certain key data / workings publicly available and the USO funding application is deemed to be made by the USP on this understanding.*

Decision 27

Decision 27: *With respect to the provision of public payphones which are "uneconomic", sufficient detail shall be provided on their geographic location and proximity of other public payphones operated by the USP (irrespective of their profitability).*

Decision 28

Decision 28: *The model provided shall be supported by comprehensive documentation, clearly setting out and explaining all inputs (both financial and otherwise), efficiency adjustments applied, engineering rules applied, cost allocation methodologies employed, depreciation methodologies applied and assumptions made.*

Decision 29

Decision 29: *Sampling may be used for certain aspects of the modelling of net cost, for example the assumptions driving the size of replacement calls. Where sampling is used, samples must be sufficiently representative of the population being sampled. Where applicable, any application of a sampling methodology by the USP must accord with ComReg Decision D07/10.*

Decision 30

Decision 30: *USP funding applications shall, where applicable, accord with ComReg Decision No. D07/10 in relation to accounting separation.*

Decision 31

Decision 31: *The calculation of the benefits of the USO shall be completed by an external expert, independent of the USP. These calculations must clearly set out: the respective methodologies; assumptions and supporting documentation used at deriving the benefits of the USO.*

These calculations must provide: (a) the benefit (in monetary terms) that the USP derives as a commercial operator; (b) the benefit (in monetary terms) that the USP derives as a result of the USO; and (c) a reconciliation with reasoning to explain the incremental difference between (a) and (b).

Decision 32

Decision 32: *Eircom, the current USP, may submit a request for USO funding to ComReg in respect of its financial period 1 July 2009 to 30 June 2010. If Eircom intends to submit such a request to ComReg, it shall do so no earlier than 1 month, and no later than 6 months following the date of this Decision. ComReg may extend this deadline, but only where it considers that there are exceptional reasons for doing so.*

Decision 33

Decision 33: *Subsequent requests for USO funding by a USP(s) may be submitted to ComReg in respect of a relevant financial year. If a USP intends to submit such a request to ComReg, the USP(s) shall do so no later than 9 months following the end of the financial year in respect of which the request is intended to be made. ComReg may extend this deadline, but only where it considers that there are exceptional reasons for doing so.*

Decision 34

Decision 34: *ComReg Document No. 07/39 dated 2 July 2007 and entitled "The Provision of the Universal Service: Request for Funding by Eircom", is hereby revoked in its entirety.*

Decision 35

Decision 35: *The net cost calculation must assess the benefits, including intangible benefits, to the USP. ComReg will consider, at a minimum, the following benefits (as a result of the USO) for a USO net cost calculation:*

- *Brand Recognition.*
- *Ubiquity.*
- *Life-cycle.*
- *Marketing.*

Decision 36

Decision 36: *For the identification of the benefits, ComReg will observe the following key principles:*

• The benefits represent effects on a USP of providing the USO which have not been accounted for in the direct costing methodology (for example, any benefits that are directly identifiable to specific revenue streams, including indirect and replacement calls revenues are excluded having been covered by the direct net cost calculation).

• Avoid the double counting of any benefits.

• The benefits are those accruing to the USP, as a consequence of being the designated USP (any benefit arising from the fact that the USP is a large player in the market is to be excluded from the calculations).