Non-confidential

Assessment of eircom's USO funding application for 2009/2010 financial year

ComReg

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Summary

In May 2012 eircom, the universal service provider of telecommunication services in Ireland has submitted its application for funding of the universal service obligation (USO) for the 2009/10 financial year. TERA Consultants has assessed this application for funding to check that the net cost of USO was calculated properly and in accordance with the existing legislation.

TERA Consultants has assessed the calculation methodology, data sources and calculations to ensure that:

- the chosen methodology corresponds to the legislation and Decisions issued by ComReg (such as Decision D04/11) and reflects the real condition of the telecommunications network;
- the data is not biased;
- calculations are performed correctly, correspond to the described methodology and contain no double counting.

The first section makes the assessment of methodological choices for each part of the model: processing revenue and cost data, estimating net costs of uneconomic areas, uneconomic customers, payphones, printed directories and services for disabled customers. TERA Consultants paid particular attention to time allocation, geographical allocation and the assessment of the avoidability levels of different cost categories; where relevant, alternative approaches and calculations were proposed by TERA Consultants.

The second section makes numerical analysis of the model. TERA Consultants verified that the value of net costs of uneconomic areas and uneconomic customers did not contain unexplained outlying points. Where the net costs of an MDF were particularly high, the main cost driver was verified. Calculations in respect to the described methodology for all model components were verified.

Finally, the potential overlaps and double-counting with intangible benefits model were identified and analysed.

TERA Consultants have considered specific findings of the PWC report on agreed upon procedures. Decision No 22 of ComReg Decision No D04/11 requires that 'Financial information shall be provided with an appropriate audit opinion or appropriate report...'. Prior to the preparation of the USO funding application ComReg engaged with eircom and PricewaterhouseCoopers (PwC) to discuss and agree the most appropriate form that any such assurance over the application should take. Arising from this ComReg entered into a tripartite engagement with eircom and PwC to formulate a set of specific procedures to be carried out on the funding application.

An 'Agreed Upon Procedures' engagement is carried out in accordance with the International Standard on Related Services 4400 'Engagements to perform Agreed Upon Procedures Regarding Financial Information' and does not constitute an examination made in accordance with generally accepted auditing standards. An

Agreed Upon Procedures engagement is not an audit or a review, the objective of which would be the expression of an audit opinion on the relevant Services. The parties to an Agreed Upon Procedures engagement (in this case eircom and ComReg) are responsible for determining whether the scope of the procedures specified is sufficient for their respective purposes in connection with the USO Funding application. A report was provided by PwC setting out the specific findings arising from the Agreed Upon Procedures carried out on eircom's Funding Application. This report has been reviewed by us as part of our assessment of the USO funding application submitted by eircom and we have considered the specific findings noted therein in our conclusions set out herein.

0.1 Methodological foreword

The principles of cost methodology used by eircom broadly adhere to the decisions set out in ComReg decision document D04/11.

In order to calculate the net cost of USO, two scenarios are compared: the current one with the hypothetic scenario where eircom does not provide those USO services which a commercial operator would not have provided. The HCA methodology is used, the top-down model is based on the accounts. As described by decision 2 of D04/211, the net cost of USO is calculated as the difference between:

- USO costs, "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", and
- USO revenues, "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."

Costs include both OPEX and CAPEX; only avoidable costs are included in the calculation. Revenues include both direct and indirect revenues. An efficiency correction on OPEX has been made using line fault index, which is one of the parameters recommended by ComReg for adjustment.

Direct revenues are received from the retail services invoiced to customers or from the wholesale services invoiced to alternative operators. Indirect revenues include interconnection revenues, revenues from calls from economic to uneconomic customers, replacement calls, etc.

Net costs of several USO components are included, as follows:

- Uneconomic areas, which are identified at an MDF level.
- Uneconomic customers in economic areas: the number of uneconomic customers in economic areas is calculated using a probability analysis, as it is allowed by the Decision.
- Payphones: the access cost of a payphone is equal to the access cost of an average line in this MDF.

- Services for disabled users, which include special services and special equipment.
- Directory enquiry services and printed directories.

It was concluded that the estimation methodology used by eircom respects ComReg's decisions and the concept of avoidable costs and practical implementation of the methodology is consistent. Remaining minor comments do not compromise the estimation of the net cost for 2009/2010 financial year and may lead only to a negligible change in the result. TERA Consultants did not assess consultants' fees. Comments and recommendations should be taken into account in future assessments.

Certain minor comments are listed below.

1. Methodological issues that have almost no impact on results:
    a. Not allocating all the one-off charges over users' life time does not strictly correspond to the decision D04/11 as interpreted by TERA Consultants.
2. The detailed description of each of the numerous cost and revenue category is not always given, that is why in some cases it is impossible to check the relevance of eircom's classification. It can have only minor impact on the final result, that is why these minor comments have not been discussed with eircom.
3. For certain MDFs the data on line length distribution was not available, no information was given on the number of such MDFs and the method to replace (✂). Since it concerns only minority of areas, the corresponding information has not been requested from eircom.

1 Methodology evaluation

TERA Consultants has evaluated the methodology of net cost calculation to check that it is consistent with ComReg's recommendations, with the concept of avoided costs, with general practice and with the network condition. First, TERA Consultants has studied how revenue and cost data was interpreted and treated; then, TERA Consultants has studied how the net cost of each of the USO components was calculated.

1.1 Revenue data

1.1.1 Revenues scope

In the model, the revenue data is taken from corporate data warehouse and consists of both direct and indirect revenues, which is in line with ComReg's Decision 3 of D04/11. They include revenues from connections, rentals, calls and other revenues, as prescribed by Decisions 4-6 of D04/11.

Note that revenue received from the Department of Social Protection is allocated to the customers who avail themselves of the allowance at the time of billing, so that this revenue is included directly and is not subject to any specific treatment.

eircom has excluded certain revenues (✂) from the scope of the net cost estimation for different reasons, primarily because the corresponding services are not based on the copper network or because revenues are not intrinsic to any one MDF. Other reasons include unavailable data, immaterial value or revenues that are not generated on eircom lines.

Since exclusion of revenues may lead to over-estimation of the net cost, TERA Consultants has checked the reasonableness of excluding each of revenue categories as presented in the table below.

Table 1. Revenues excluded from the USO scope

HCA Statement	Exclusion	Amount (€)	Amount (% of excluded revenues)	Basis	TERA Consultants' evaluation
DSL Retail	Satellite rentals & connections revenue	✂	✂%	Satellite revenue excluded as not copper based	TERA Consultants agrees with the exclusion
Apparatus Supply	ebs CPE Sales & Maintenance, ICT Hardware and Chargeable forms	✂	✂%	Sale of corporate telecommuni-cations equipment which is not intrinsic to any one MDF area	TERA Consultants agrees with the exclusion

HCA Statement	Exclusion	Amount (€)	Amount (% of excluded revenues)	Basis	TERA Consultants' evaluation
Leased Lines	Fibre based connections and rentals excluded, wholesale ethernet and international rentals and connections excluded	✂	✂%	Excluded on the basis that this delivered by way of fibre or are International Leased Lines	TERA Consultants agrees with the exclusion: universal services are indeed historically provided through the copper network. The fibre cost is not included.
Local Access Network	Co-Location	✂	✂%	None of the locations would impact on uneconomic areas - proved this through iteration (ran model, no impact). Exchange based Wholesale revenues not directly dependent on individual customer lines	TERA Consultants agrees with the exclusion
Freefone	Freefone International	✂	✂%	Incoming calls from International locations	It was understood that Freefone is the short number service that allows for special

HCA Statement	Exclusion	Amount (€)	Amount (% of excluded revenues)	Basis	TERA Consultants' evaluation
Freefone	Freefone National	✂	✂%	Specific revenues that were excluded were calls made from OAO's & Mobiles and revenues for hosting Freephone numbers - basis being that revenues are not generated at an eircom exchange or customer level	pricing where the receiving party pays fully or partially.[1] Freefone call may terminate both on fixed and mobile network. Freefone call may originate on fixed network of eircom or of an OAO, on a mobile line or in an international location. It was understood that eircom has excluded those calls that originate on a mobile network, at OAO or in an international location. It is not completely clear why this decision was made. In the counterfactual scenario where USO does not exist and the receiving party happens to be in an uneconomic area, the revenue is lost irrespective of call origination. Rather, eircom should have excluded those calls that satisfy two criteria: • originate in an international location, on OAO's network or Mobiles; • terminate on the mobile network (mobile users are not disconnected even if USO is cancelled). However, this minor modification does not change the result significantly. Indeed, it changes the treatment only of a small portion of calls,

[1] http://business.eircom.net/broadband/products/landline/voice/eircomfreefoneservices/

HCA Statement	Exclusion	Amount (€)	Amount (% of excluded revenues)	Basis	TERA Consultants' evaluation
					those that come from an international location, OAO and mobile and terminate on the fixed network. Moreover, it would change only the revenue generated by the called party. Since the called party is a business customer, it is unlikely to by uneconomic, consequently this revenue will impact only economic customers and not the net cost. Also refer to concluding remarks on page 12
Operator Services	Tele-conferencing revenues	✂	✂%	Not exchange dependant	TERA Consultants agrees with the exclusion
Retail Remaining	VOIP	✂	✂%	On examination it was determined that the majority of VOIP revenues were in respect of corporate & business and so delivered by way of fibre	TERA Consultants agrees with the exclusion
Retail Remaining	VPN	✂	✂%	Data unavailable to allow for distribution through model	TERA Consultants agrees with the exclusion
Supple-mental Services	BIP, ATM, Frame Relay, Other SW Data	✂	✂%	Excluded on the basis that it is delivered by way of fibre	TERA Consultants agrees with the exclusion

HCA Statement	Exclusion	Amount (€)	Amount (% of excluded revenues)	Basis	TERA Consultants' evaluation
Internet Services Supply	All ISS revenue	✂	✂%	Value added internet dependent - not intrinsic at a customer/ exchange level - revenues not dependent on eircom's customer base	TERA Consultants agrees with the exclusion
Retail Remaining	Equant & Infonet GM	✂	✂%	Immaterial	TERA Consultants agrees with the exclusion
Core Network	Ancillary - all ancillary products except White Label Access	✂	✂%	Calls not being generated on eircom lines e.g. mobiles ringing eircom DQ	TERA Consultants agrees with the exclusion.
Other Remaining	IT External Services	✂	✂%	not related to the network; design & consultancy-type services provided to external parties	TERA Consultants agrees with the exclusion
Other Remaining	Meteor Re-charges	✂	✂%	Cost re-charges - not relevant	TERA Consultants agrees with the exclusion
Other Remaining	New Wave Solutions	✂	✂%	Not related to the network; solutions include Managed Network Services, Unified Communica-tions, Security CPE & Software	TERA Consultants agrees with the exclusion
Other Remaining	Wholesale Managed Services	✂	✂%	Not intrinsic to any one exchange	TERA Consultants agrees with the exclusion
Other Remaining	IPTV	✂	✂%	Immaterial	TERA Consultants agrees with the exclusion

HCA Statement	Exclusion	Amount (€)	Amount (% of excluded revenues)	Basis	TERA Consultants' evaluation
Other Remaining	Property	✂	✂%	Not intrinsic to any one exchange	TERA Consultants agrees with the exclusion
Other Remaining	Repayable Works Orders	✂	✂%	Exclude on basis that costs have already been excluded	TERA Consultants agrees with the exclusion
Other Remaining	SCCP	✂	✂%	International - not intrinsic to the exchange or the customer	TERA Consultants agrees with the exclusion
Other Remaining	Staff on Loan	✂	✂%	Cost re-charges - not relevant	TERA Consultants agrees with the exclusion
Other Remaining	Agency Services	✂	✂%	Fibre based svcs for corporates	TERA Consultants agrees with the exclusion
Other Remaining	Web Hosting	✂	✂%	Not intrinsic to any one exchange	TERA Consultants agrees with the exclusion
Other Remaining	Other Remaining	✂	✂%	Not intrinsic to any one exchange	TERA Consultants agrees with the exclusion
Core Network	Interconnect Links	✂	✂%	Excluded as not site specific	If the revenue from interconnect links varies with traffic or the number of customers this revenue may decrease if some customers or areas are disconnected. However, taking it into account is difficult and requires a rule to allocate the interconnect links revenue to customers. This modification will not change the result significantly: this revenue corresponds to only 1% of the total revenue, hence only a minor potential impact on the final

HCA Statement	Exclusion	Amount (€)	Amount (% of excluded revenues)	Basis	TERA Consultants' evaluation
					net cost. Also refer to concluding remarks on page 12.
Core Network	CPS	✂	✂%	Immaterial	TERA Consultants agrees with the exclusion
Core Network	Number Portability	✂	✂%	Immaterial	TERA Consultants agrees with the exclusion

Source: ✂, TERA Consultants analysis

For three of the 28 revenue categories the exclusion criteria was not entirely clear. These categories however only constitute 2% of total revenue and as such the potential impact is small. As these categories are relatively minor, TERA Consultants did not seek further information given time constraints and the potential complexity in gathering the information. TERA Consultants conclude that the revenue categories were excluded on reasonable grounds and do not consider these cause any bias to the net cost estimation.

1.1.2 Time allocation of revenues

Two questions have been considered with respect to revenue time allocation.

First question concerns allocation of one-off charges. In the model, all the one-off charges (not including RAT connections) that were received during the 2009/10 financial year are allocated to the same year.

> *"All other one-off charges are allocated to the year in question. Hence all one-off charges that are billed in the 2009/10 are allocated to 2009/10."* (Model Documentation)

This approach does not exactly correspond to the TERA Consultant's interpretation of ComReg's Decision D04/11. Decision states that "*Direct revenues <…> include: One-off connection charges: where the revenue should be allocated over the expected life of the customer <…>.*" (Decision n°4) It means that it would be more appropriate to allocate all the one-off revenues to the expected life time. Such treatment was made for RAT revenues: they are allocated to 4 consecutive years if the customer is not disconnected before. It is not clear why eircom did not apply the same principle for other one-off charges.

eircom maintained the allocation rule used since in their view it corresponds to their interpretation of the decision. However, eircom's approach does not compromise the final estimation of the net cost.

The allocation rule approach affects the final result but the amplitude and the impact of this approach is impossible to assess based solely on the data from the model. The total one-off revenue from additions in 2009/10 excluding RAT is equal to €✂[2] which is an evidence of a non-negligible impact on the resulting net cost. If revenue was allocated to the customers' lifetime, a part of revenues from the users connected during 2009/10 would be re-allocated to the following years, which would be partially compensated by a part of revenues gained during the previous years and re-allocated to the year 2009/10. That is why the choice of allocation rule is close to neutral only under the condition that the number of connections as well as the connection price is stable over the years. Otherwise, the chosen allocation rule may lead to under-estimation of the net cost if the number of connections has increased in 2009/10 compared to previous years and to over-estimation in the opposite case.

eircom undertook an additional analysis to check the impact of the one-off charges allocation rule on the final results. eircom has collected information on the historical retail demand for one-off connections from July 2006 to January 2011 by three connection types:

- In–situ: a home previously on an eircom home phone line where all line work is in place - connection charge €25.40.
- Pre–cabled: a home has never had an eircom phone line but all line work is in place - connection charge €49.99.
- Standard: a home has never had an eircom phone line, or all line work is not in place - connection charge €121.93.

✂

[2] Source: ✂

Figure 1. ✂

Source: ✂

✂

Data on wholesale services was not available, however, eircom observes that wholesale connections were ✂ during 2006-2010. eircom has taken a conservative hypothesis: it was assumed that the wholesale connections rate was stable. This hypothesis gives the ✂ of one-off revenues in 2009/2010, since with ✂ number of connections, the average over 4 years 2006-2010 in not ✂ than the number of connections in 2009/2010. Consequently, this gives an ✂ estimation of the net cost.

It was found that if the one-off fees were allocated over the expected life, then the net cost in the Area Model would drop by 1%.

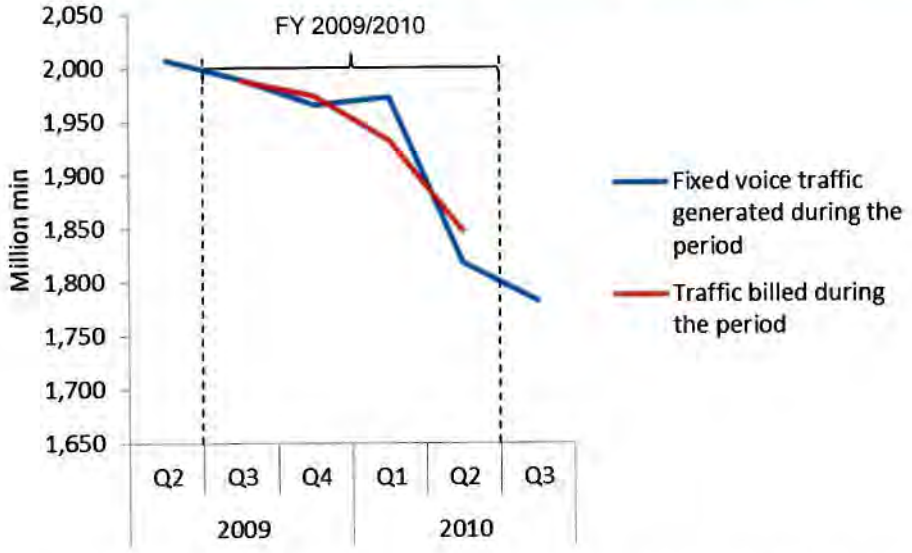
The second question concerns the treatment of the monthly payment data. Revenue data that was used in the model corresponds to the bills issued during the financial year and not to the consumption during this year (Model Methodology). As the billing month does not necessarily coincide with the month of actual consumption, these two values are not equivalent. Indeed, minutes consumed during one month may be paid either the previous month or the next month. eircom preferred not to correct for this issue since such correction would be very difficult and time consuming. In particular, eircom considers the case when the package price relates to a billing period and not to a calendar month. eircom states that in this case an assumption is needed to apportion the price over calendar months.

TERA Consultants notes that this choice leads to a mismatch between year cost which corresponds to the consumption during the year and the revenue which corresponds not to the consumption but to the billing during the year.

This choice may be problematic if consumption changes significantly over the months, for example, if consumption in June 2009 may be different from that in June 2010. Indeed, as mobile telephony develops, consumption pattern changes, fixed telephony may be used less compared to mobile telephony.

TERA Consultants has made a check in order to estimate the effect. It has analysed the trend of the per quarter traffic generated on fixed phones. The graph below presents the traffic evolution. TERA Consultants made a simulation of the traffic value billed during the period. It was supposed that only a half of traffic generated during one quarter is billed during the same quarter, one fourth billed during the next quarter and one fourth - during the previous quarter.

Figure 2. Fixed outcoming traffic evolution Q2 2009-Q3 2010, million min



Remark: billed traffic is calculated as a weighted average of three quarters with coefficients 0.25, 0.5 and 0.25

Source: ComReg Quarterly Key Data Reports Q3 2009-Q2 2010, TERA Consultants analysis

It can be seen that the actual traffic declines almost each quarter except for the first quarter of 2010. Hence, when a moving average is calculated, high traffic of the previous quarter partially compensates low traffic of the following quarter, so that billed traffic is close to generated traffic.

It means that the simplifying assumption made by eircom does not have a significant effect on the final result.

eircom could have corrected for this inconsistency by checking the payment method for each customer. When the billing period does not correspond to a calendar month, the package price may be simply allocated in proportion of days: a day price multiplied by the number of days in the month.

✂eircom explains that the issue of monthly fees time allocation is already addressed in

Statutory Accounts where the revenue is recognised on the basis of when services are consumed. That is why the revenue in the model corresponds to the consumption during the year in question.

eircom does not allocate all the one-off charges over users' life time. It does not strictly correspond to the decision D04/11 as interpreted by TERA Consultants. However, the impact of this change in allocation method is insignificant with regards to the period considered and does not compromise the final net cost estimation.

1.1.3 Geographic allocation and sampling of revenues

Since the complete detailed data on revenues from calls was not available, sampling was used to restore the full-year revenue data by MDF both for retail and wholesale direct revenues.

For the **direct retail revenue**, detailed data determining both calling and receiving party was only available only for 3 months: July 2009, December 2009, and June 2010. Aggregated data was available for the whole year but it gives only calling party data. In order to determine the receiving party, a three month sample was used; it was assumed that each customer has called the same phone numbers and in the same proportion as during these 3 months.

Similarly, for the **direct wholesale revenue**, detailed information was only available for June 2010. eircom noted that sampled wholesale traffic used to derive routing factors was used to assess whether June data is representative. Clarification was sought on the issue of seasonality and eircom provided a satisfactory detailed explanation.

TERA Consultants noted that there is a risk of seasonal effect: months of December, July, and June are not representative of the whole year, as they coincide with vacation periods and lower business activity. Assuming uneconomic MDFs are generally those with no business customers and that during the vacation customers tend to call more often non-business destinations, the traffic to uneconomic MDFs is relatively higher and consequently eircom tends to over-estimate the revenue and under-estimate the net cost of economic MDFs. To check the impact of a seasonal effect, one can use data of those years where it is available and not necessarily for 2009/10.

Following this remark, eircom has conducted additional statistical analysis of the potential seasonal effect. They took July 2011, December 2011, and June 2012 data and calculated the proportion of calls, minutes and revenue that were made between each pair of MDFs. This was repeated for the full financial year 2011/2012. Analysis was carried out to determine whether the results differ for the proportion of calls, minutes and revenue for the 3 months compared to the whole year, for both national and local calls. To do this, the t-test was used.[3] The analysis was conducted both on individual MDFs and all the MDFs. It was concluded that the proportion of local and

[3] A t-test is a statistical hypothesis test in which the test statistic follows a Student's t distribution if the null hypothesis is supported.

national calls, minutes and revenues allocated by the 3 month sample of July, December and June in 2011/12 did not differ from the allocation approach which used the complete data for the year 2011/2012. eircom adds that there is little reason to believe that the analysis of wholesale data could distort the overall result. Therefore, it can be concluded that no seasonality effect have been found.

However, this issue arises only for the net cost estimation of 2009/2010 financial year. eircom plans to review the policy of holding customer data, so that CDR data for 2010/11 and subsequent years is not deleted if a USO funding submission is to be made. For the future assessments, complete data of inter-MDF and intra-MDF calls should be used.

At the final stage of the estimation procedure estimated revenue was adjusted to be equal to the revenue from regulatory accounts, to account for discounts, prepayments, and other differences.

Geographic allocation of indirect revenues was more difficult to accomplish in the absence of complete information. ✂

✂

✂

eircom explains that indirect core revenues constitute only 1% of total core revenues and that the reallocation across all MDFs using direct revenue as allocation key has no impact on the results. This explanation is satisfactory given that indirect core revenues constite only a small part of the total revenues.

The principles of geographic allocation of data are appropriate. Complete data on inter-MDF and intra-MDF calls should be used for future assessments.

1.1.4 Estimation of replacement revenues

In the case of disconnection of a customer, the disconnected customer will replace a part of calls from another fixed phone or from a mobile phone. Below different estimation hypotheses are discussed. TERA Consultants concludes that the approach of calculating replacement revenues is robust.

1.1.4.1 Replacement rates

eircom estimates the replacement rate, the portion of calls to be replaced, based on the main assumptions presented in the table below.

Table 2. Replacement rates

Model component	Calls replaced using fixed network		Calls replaced using mobile network	
	outgoing	incoming	outgoing	incoming
Disconnected areas	✂%	✂%	✂%	✂%
Disconnected customers	✂%	✂%	✂%	✂%

Source: ✂

This table reflects two main hypotheses. First, if a whole area is disconnected, it is more difficult to find another fixed phone in the proximity than in the case when only one customer is disconnected, and correspondingly the area replacement rate is lower. Second, replacement is more often made using mobile than fixed network.

To find the average replacement rate between fixed and mobile network, eircom calculates the weighted average using the proportion between fixed and total calls on the national level (✂%):

Replacement outgoing calls for areas = ✂%

Replacement incoming calls for areas = ✂%

Replacement outgoing calls for customers = ✂%

Replacement incoming calls for customers = ✂%

Data on replacement calls used by eircom is old: it dates from 1997. Since telecommunication networks have evolved a lot during the last 15 years, TERA Consultants has analysed more recent decisions on the replacement rates as presented in the following table.

Table 3. European benchmark of the replacement revenues rates

Country	Last decision	Replac. revenue is taken into account	Mobile penetration rate and coverage[4]	Replac. revenue from mobile network is taken into account	Replacement rate for outgoing calls		Replacement rate for incoming calls	
					Disconnected area	Disconnected customer	Disconnected area	Disconnected customer
Ireland	Current application	Yes	119.3% in October 2009 Meteor: 99% population coverage. [5]	Yes	✂	✂	✂	✂
Belgium	Decision of BIPT of May 17, 2005 regarding the net cost for the year 2003. [6] The note of BIPT of May 27, 2005, details the methodology.	Yes	102.9% (1 October 2009) and 92% (October 2006). KPN Belgium: nearly 100% population coverage.	No	9% on fixed network (neighbours 0%, payphones 0%, office 9%) 81% on mobile network	13% on fixed network (neighbours 3%, payphones 1%, office 9%) 77% on mobile network	90% on both networks	90% on both networks
Italy	Verifica del costo netto del Servizio Universale per l'anno 2003, Relazione Finale, March 8, 2006	Yes	146.0% (October 2009) and 134% (October 2006) Telecom Italia: second generation population coverage GSM/EDGE 99.8% (April 2011)[7]	No	5% on fixed network	5% on fixed network	1% on fixed network	1% on fixed network

[4] European Commission. Reports on the Implementation of the Telecommunications Regulatory Package.

[5] http://www.meteor.ie/plans/coverage/

[6] BIPT. Méthode pour le calcul du coût net du service universel des télécommunications coût net prévisionnel pour l'année 2003. 27 mai 2005

[7] Inquiry on the prospects of broadband development. Hearing of Telecom Italia Spa, Senate of the Republic, VII Permanent Commission (Public Works and Communications), Rome, 7 April 2011

Spain	The report of the CMT of 2010 (AEM 2010/1738), regarding the determination of the net cost for the financial year 2008	Not specified	-	-	-	-	-	-
France	ARCEP, Decision 2011-0356 of April 26, 2011; Decision 2011-0573 of May 24, 2011 (financial year 2009)	Not specified	-	-	-	-	-	-
UK	Ofcom, Review of the Universal Service Obligation, March 14, 2006	Yes	-	Not specified	Not specified	Not specified	Not specified	Not specified
Portugal	Anacom, Decision on the Methodology for Calculating The Net Costs of The Electronic Communications Universal Service, 2011	Yes	146.2% (October 2009) and 122% (October 2007)	No	"in a market where the access to and use of the mobile telephone service is wide and general, one would expect that, in case the USP decided to discontinue the fixed telephone service, it would receive a small benefit from the effect of substitution calls, which for the most part would benefit mobile service operators."			

Source: TERA Consultants analysis

European benchmarks show that the replacement rate on the fixed network is rather low, between 0% and 13%. It is linked with the mobile penetration rate. Indeed, in Portugal and Italy where this rate is very high, the replacement rate on the fixed network is low: 0% and 1-5% respectively. In Belgium, where the mobile penetration rate was low, the replacement rate on the fixed network was higher: 9-13%. In terms of mobile penetration rate, Ireland is situated in the middle of this interval, that is why **eircom's fixed replacement rate of 2-8% is consistent with the international benchmark**.

Often, the replacement of the outgoing calls made from a mobile phone is not taken into account. Indeed, it is not calculated by Belgian, Italian or Portuguese regulators even though the corresponding universal service providers have their own mobile networks. All three regulators agree that the replacement rate on the mobile network is high but only BIPT gives precise numbers: between 77% and 81% in 2005.

However, ComReg considers that the USP may take into account the outgoing calls made from a mobile phone. According to ComReg such analysis must take into account competitive position of mobile operators and cost of serving mobile customer such as termination rates, transit charges, etc. (D04/11).

Given ComReg's recommendations, including of the replacement on the mobile network is appropriate.

1.1.4.2 Replacement revenue from incoming calls

A separate methodological issue arises when calculating the replacement rate for the retail revenue from incoming calls. The principle of its calculation is not exactly the same as for the outgoing calls. Indeed, let us suppose that an uneconomic customer is disconnected. In this case the customer will use either fixed or mobile phone to replace a part of the calls, and correspondingly either fixed or mobile operator will obtain additional revenue. The customer will also receive calls using either fixed or mobile network. However in this case it is not the customer who pays but the calling party, that is why it does not matter on which network the call ends and the only thing that matters is the fact that a call is replaced. Consequently, the replacement rate is equal to the simple proportion of the replaced calls and without multiplying by market shares.

If all the other assumptions do not change, the calculation is presented as follows:

Calculation made by eircom:

Replacement incoming calls for areas = ✂%

Replacement incoming calls for customers = ✂%

Calculation proposed by TERA Consultants:

Replacement incoming calls for areas = ✂%

Replacement incoming calls for customers = ✂%

This alternative calculation increases the replacement revenue and the net cost.

TERA Consultants underlines that the correct treatment of incoming replacement calls depends on the nature of revenues that are considered. Two types of revenues may be considered, retail or wholesale:

- The incoming wholesale revenue includes the revenue from call termination. This revenue is received by the operator to which the uneconomic customer is connected. Only those calls that are replaced using eircom's network generate income for eircom and the network on which the call ends does have an impact. In this case the replaced revenue is indeed proportional to the eircom market share and TERA Consultants agrees with the reasoning of eircom.
- The incoming retail revenue includes the direct revenue from calls between customers sent by those customers who stay connected. The revenue is generated by the customer who calls and the revenue is received by the operator of an uneconomic customer, irrespectively of the affiliation of the uneconomic customer. Consequently, this revenue does not depend on which

network the call terminates. In this case the market share of ericom does not matter.

In the model eircom does not consider the first type of revenue but the second type. Indeed, the replacement rate is used to correct the incoming revenue. Let us consider it more in detail. For uneconomic area, the calculation is made in the Area Model. The replacement rate is multiplied by Total Direct Incoming Retail costs minus Direct Retail Incoming revenue (core services).[8] This revenue includes revenue from local and national calls received from other eircom fixed customers located at other MDFs. If this MDF has disappeared, a part of the incoming calls would terminate using one of substitution methods: mobile network or fixed network in another location. But the calling party will still be affiliated to eircom.

Following these remarks, eircom updated its calculation so as not to include the market share in the formula of the incoming replacement revenues.

TERA Consultants agrees with the method of estimating incoming replacement revenue.

1.1.4.3 Numerical precision

Two issues below have been raised with respect to precision of the calculations, which can only negligibly change the final result. They are insignificant and can be a result of rounding.

1. The share of fixed voice traffic relative to the total traffic is taken from ComReg Quarterly report Q3 2010, summary. It is not clear why eircom takes Q2 2010 as a reference period. If the proportion was calculated as the average of the whole financial year, Q3 2009 to Q2 2010, it would have been 43% instead of 41% in Q2 2010. It would slightly decrease the replacement revenue and hence decrease the net cost. However, this effect is small.
2. eircom takes Meteor's market share of 20% on the mobile market, which corresponds to Q3 2010. If it has taken the average market share of the whole financial year, it would have been 20.8%. However, this effect should be very small.

1.1.4.4 Profit margin in mobile communications

eircom makes an assumption that mobile profit margin is equal to fixed profit margin.

TERA Consultants has suggested that to make calculations more precise, eircom could take into account that the mobile profit margin is higher. According to the eircom quarter report[9], EBITDA margin is 39% for fixed and only 24% for mobile telephony. In addition, in absolute terms, the mobile revenue per minute is lower than the fixed revenue per minute.

[8] ✂

[9] eircom. Fourth Quarter and Twelve-month Results to 30 June 2010. 31 August 2010

The Irish Communications Market Quarterly Report (Key Data Report – Q2 2010 REVISED) illustrates the price of residential and mobile calls in Ireland:

- The OECD Residential PSTN Basket, based on a basket of 140 calls per month basket, would cost between 55 and 60 USD PPP in Ireland (see p.22 of the Report);
- The OECD High User Post Paid Mobile Basket, based on the 300 calls per month basket, would also cost between 55 and 60 USD PPP (see p.64 of the Report).

This shows that mobile revenue per minute is much lower (of the order of two times) than the fixed revenue per minute. Consequently, replacement revenue is over-estimated, and hence the net cost is over-estimated.

However, eircom explains that EBITDA is not an appropriate measure of the profit margin in this case in particular because it does not include depreciation. There is not enough information to properly estimate the margin in question for mobile communications. eircom also explains that the incremental cost of one mobile user is likely to be lower than the one of fixed user since the former does not need a dedicated infrastructure. Consequently, if an additional replaced call minute is added, its incremental cost is lower in mobile than in fixed communications. For the same revenue increase it would mean that the incremental profit is even higher for mobile communications than for fixed communications.

TERA Consultants estimates that given the complexity in finding the correct estimation for the profit margin, it is appropriate to accept the simplified hypothesis made by eircom on the equal profit margin in fixed and mobile communications. Additionally, the impact on the net cost estimation is small.

TERA Consultants agrees with the approach of calculating replacement revenues.

1.2 Cost data

Cost data includes OPEX and CAPEX of access and of core networks.

The cost inputs are taken from eircom's historical accounts; it respects the Decision D04/11 which prescribes the HCA methodology adjusted for efficiencies and accounting for the avoidable costs.

The depreciation method used in the model follows historical accounting rules.

The return on capital is based on the Net Book Value of assets. Where costs have been fully depreciated the NBV is zero according to the accounts and both depreciation and return on capital is zero. The cost of capital used is 10.21%.[10]

[10] ✂

When analysing costs, special attention should be paid to the following main issues:

- which cost categories are included in the USO model and do they correspond to revenue services;
- which cost categories are defined as avoidable or partially avoidable;
- how costs are allocated to MDFs;
- how efficiency adjustment is made.

1.2.1 Access network cost

1.2.1.1 OPEX

Geographical allocation

The table below presents the list of access OPEX and their geographical allocation keys: revenue, working lines, equipment spend, faults, physical provides by service, equipment NBV, etc. For each cost, TERA Consultants estimates the relevance of the chosen allocation key.

Table 4. Geographical allocation of access network OPEX

Network element	Cost description	Allocation to MDF	TERA Consultants' evaluation
Copper access	MLC Reactive maintenance costs associated with customer carriers	Carrier Faults	TERA Consultants agrees with the allocation method
Copper access	MLG Reactive Maintenance Severe Weather Conditions	Mixed Faults	TERA Consultants agrees with the allocation method
Copper access	MLI Preventative maintenance costs associated with pressurisation equipment	MLI	TERA Consultants agrees with the allocation method
Copper access	MLO Reactive maintenance costs associated with copper overhead network	OH Faults	TERA Consultants agrees with the allocation method
Copper access	MLR Reactive maintenance costs associated with fixed wireless network	Faults by MDF	TERA Consultants agrees with the allocation method
Copper access	MLU Reactive maintenance costs associated with copper underground network	UG Faults	TERA Consultants agrees with the allocation method
Copper access	MRO Restorative Maintenance Copper Overhead	MRO	TERA Consultants agrees with the allocation method

Network element	Cost description	Allocation to MDF	TERA Consultants' evaluation
Copper access	MRU Restorative Maintenance Copper Underground	MRU	TERA Consultants agrees with the allocation method
Copper access	MVO Preventative Maintenance Overhead Plant	MVO	TERA Consultants agrees with the allocation method
Copper access	MVU Preventative Maintenance Underground Plant	MVU	TERA Consultants agrees with the allocation method
Copper access	MTT Costs associated with updating and maintaining cable records	Working Lines	TERA Consultants agrees with the allocation method
Copper access	MXY Maintenance costs power equipment	Working Lines	TERA Consultants agrees with the allocation method
Copper access	GF122 Network Rates	Total NBV of access assets	TERA Consultants agrees with the allocation method
Copper access	BP Network property costs associated with Copper Network in eircom exchanges.	Building pool model	TERA Consultants agrees with the allocation method
Copper access	GB101 Access Network Overhead (Planning and Design)	Working Lines	TERA Consultants agrees with the allocation method
Copper access	GB102 Access Network. Underground (Planning and Design)	Working lines	TERA Consultants agrees with the allocation method
Dassnet	Leased Line Exchange equipment (OPEX associated with Leased Line network elements for Martis and Dassnet Equipment)	GBV	TERA Consultants agrees with the allocation method
DSL-DSLAM-4	Cost of DSLAM used for DSL services	Number of DSL working lines in each MDF	TERA Consultants agrees with the allocation method
Leased Line	Provisioning Costs of Provisioning Activities reported within Leased Line Network Element in Core Network	Leased Line service volumes by MDF	TERA Consultants agrees with the allocation method
Leased line	Repair	Leased Line	TERA Consultants agrees

Network element	Cost description	Allocation to MDF	TERA Consultants' evaluation
		Volumes	with the allocation method
Provisioning	Provisioning - Access Admin-4	Unbundled Metallic Local Path	TERA Consultants agrees with the allocation method
Provisioning	Provisioning - PSTN Non-Traffic-4	PSTN / ISDN	TERA Consultants agrees with the allocation method
Provisioning	Provisioning - ISDN-4	PSTN / ISDN	TERA Consultants agrees with the allocation method
Provisioning	Provisioning - DSL-4	DSL - Retail	TERA Consultants agrees with the allocation method
Provisioning	Provisioning - Access Bitstream-4	DSL - Bitstream	TERA Consultants agrees with the allocation method
Provisioning	Provisioning - CPS WLR-4	Wholesale Line Rental	TERA Consultants agrees with the allocation method
Provisioning	Provisioning - LLU (ULMP & LS)-4	Unbundled Metallic Local Path	TERA Consultants agrees with the allocation method
Provisioning	Provisioning - Other Access - CMA-4	Wholesale Line Rental	TERA Consultants agrees with the allocation method
Provisioning	Costs of Provisioning Activities reported within Business Specific costs	The number of physical provide volumes for relevant services by MDF	TERA Consultants agrees with the allocation method
Repair - Access	Costs of Repair network elements within Access Network	The relative volume of working lines or service faults for the relevant services by MDF exchange area	TERA Consultants agrees with the allocation method
DSL retail		Number of lines DSL-R	TERA Consultants agrees with the allocation method
PSTN/ISDN retail		PSTN/ISDN number of lines	TERA Consultants agrees with the allocation method
Subscriber Unit	Costs of elements of Line Cards	PSTN/ISDN service volumes by MDF	TERA Consultants agrees with the allocation method

Source: cost files

TERA Consultants concludes that the geographical allocation keys of access OPEX are relevant and reflective of real-life cost drivers.

TERA Consultants agrees with cost drivers of different OPEX categories.

Avoidability

In Appendix F of Model Documentation the main cost categories for OPEX and provisioning for access network are defined either as fully avoidable, or as partially avoidable, or as unavoidable. Customer level avoidability depends on customer's location: generally avoidability is higher in isolated hamlets than in the housing area.

Table 5. Categorisation of access OPEX by degree of avoidability

Cost Category	OPEX Codes / Asset Class	Cost driver	Housing Area	Isolated Housing	TERA Consultants' assessment
Fully Avoidable Distance Dependent OPEX	**NE: Copper Access** MLC – Reactive Maintenance Customer Carriers MRO – Restorative Maintenance Copper Overhead MLO – Reactive Maintenance Copper Overhead Includes a share of MLG - Reactive Maintenance Severe Weather Conditions (including GF155 - Network Plant Storm Maintenance) allocated across MLO, MLU and MLC Includes a share from WMC – Work Management allocated pro-rata to the direct costs of MLC, MLG, MLI, MLO, MLU, MRO. Includes a share from WPL – Work Planning Time allocated pro-rata to the direct costs of MLO, MLU, MVO and MVU. Includes a share of GF101 – Access Network Overhead allocated pro-rata to the direct costs of MLO, MLR, MRO and MVO. Includes a share GF102 – Access Network Underground allocated pro-rata to the direct costs of MLC, MLI, MLU, MRU, MVU and MIT.	Per km	Fully Avoidable	Fully Avoidable	TERA Consultants agrees with the assigned category

Cost Category	OPEX Codes / Asset Class	Cost driver	Housing Area	Isolated Housing	TERA Consultants' assessment
Partially Avoidable Distance Dependent OPEX	**NE: Copper Access** MVO - Preventative Maintenance Overhead Plant MRU – Restorative Maintenance Copper Underground MLU – Reactive Maintenance Copper Underground Includes a share of MLG - Reactive Maintenance Severe Weather Conditions (including GF155 - Network Plant Storm Maintenance) allocated across MLO, MLU and MLC Includes a share from WMC – Work Management allocated pro-rata to the direct costs of MLC, MLG, MLI, MLO, MLU, MRO. Includes a share from WPL – Work Planning Time allocated pro-rata to the direct costs of MLO, MLU, MVO and MVU. Includes a share of GF101 – Access Network Overhead allocated pro-rata to the direct costs of MLO, MLR, MRO and MVO. Includes a share GF102 – Access Network Underground allocated pro-rata to the direct costs of MLC, MLI, MLU, MRU, MVU and MIT.	Per km	Un-avoidable	Partially Avoidable , only portion of line outside housing area.	TERA Consultants agrees with the assigned category
Unavoidable Distance Dependent OPEX	**NE: Copper Access** MVU – Preventative Maintenance Underground Plant MLI – Preventative maintenance costs associated with pressurisation equipment	Per km	Un-avoidable	Un-avoidable	TERA Consultants agrees with the assigned category

Cost Category	OPEX Codes / Asset Class	Cost driver	Housing Area	Isolated Housing	TERA Consultants' assessment
	Includes a share from WPL – Work Planning Time allocated pro-rata to the direct costs of MLO, MLU, MVO and MVU. Includes a share GF102 – Access Network Underground allocated pro-rata to the direct costs of MLC, MLI, MLU, MRU, MVU and MIT.				
Non-distance dependent Customer specific OPEX	**NE: Copper Access** GF122 – Network Rates MLR – Reactive maintenance costs associated with fixed wireless network MTT – Costs associated with updating and maintaining cable records NE: Repair Access MBP – Maintenance of PRA's and FPRA's MCY – DSL Local Network – Fault Repair MLA – ULMP & LS – Customer Line MSN – Line Work MST – Network Repair Centres EA101 – PSTN (Non-Traffic) - CMA Repair activity EA121 – LLU (ULMP & Line Sharing) - CMA Repair activity EA137 – Access - bitstream - CMA Repair activity EA138 – CPS single billing - wholesale line rental - CMA Repair activity EB101 – PSTN (Non-Traffic) - CMA Repair activity EB102 – ISDN (Non-Traffic) - CMA Repair activity EB120 – DSL	Per Line	Fully Avoidable	Fully Avoidable	Additional explanation on GF122 (network rates paid to national authorities) was provided by eircom. It is ✂% avoidable in Area Model. If the area is not served then there would be no basis for charging network rates. ✂% of the costs charged to this activity are identified as Non Network rates and excluded (is fixed). It is categorised as non-distance-dependent customer specific OPEX in Customer Model, fully avoidable both inside and outside housing areas. It is not clear why costs associated with updating and maintaining cable records (MTT) is considered avoidable.

Cost Category	OPEX Codes / Asset Class	Cost driver	Housing Area	Isolated Housing	TERA Consultants' assessment
	(Wholesale & Retail) - CMA Repair activity EB121 – LLU (ULMP & Line Sharing) - CMA Repair activity JB116 – Fault Handling - CMA Repair activity WMC – Work Management – support for repair activity MSO – Maintenance of PTSN Service (Customer Line)				There may be a fixed cost corresponding to the purchase of software and hardware. However, this minor comment does not compromise the model's results.
Unavoidable Non-distance Dependent OPEX	**NE: Copper Access** MXY – Maintenance costs power equipment (includes G#140 – DC Power) GB101 – Access Network Overhead (Planning and Design) GB102 – Access Network. Underground (Planning and Design) **NE: Building Pool** BP – Network property costs associated with Copper Network in eircom exchanges.	Per Line	Un-avoidable	Un-avoidable	TERA Consultants agrees with the assigned category
Provisioning	**NE: Provisioning Access** IAM – ACTIVATION DESK ~ Line activation for ISDN & FWA services IBA – LINE WORK (BASIC RATE ACCESS) ICF – FWA DSL PACKET TECH INSTALLATION - CPE ICR – REMOVAL OF CUSTOMER CARRIERS ICU – CPE FOR WHOLESALE DSL ICW – DSL - ASSIGNMENT OF FACILITIES AND ACTIVATION OF PATH	Per Line	Fully Avoidable	Fully Avoidable	TERA Consultants agrees with the assigned category

Cost Category	OPEX Codes / Asset Class	Cost driver	Housing Area	Isolated Housing	TERA Consultants' assessment
	IEH – FIELD SUPPORT ILA – ULMP & LS SERVICE ORDER COMPLETION IPA – LINE WORK (PRIMARY RATE ACCESS) ISO – LINE WORK CB101 – PSTN (Non-traffic) CB102 – ISDN (Non-traffic) CB125 – LLU (Co Location) CB126 – DSL (Wholesale & Retail) CB134 – LLU (ULMP & Line Sharing) CB149 – Access - bitstream CB150 – CPS single billing - wholesale line rental CD101 – PSTN (Order handling) IPC – PROVISIONING CONTROL WMC – WORK MANAGEMENT NE: Provisioning Retail ICV – INSTALLATION OF INTERNAL WIRING AND CPE FOR RETAIL DSL ISD – SYSTEMS (INTERNAL WORK) DATA COMMS CPE EQUIPMENT ISS – INTERNAL WORK GB103 – CPE CB106 – CPE Standard CB107 – CPE Other CB113 – Repayable Works Orders CB126 – DSL (Wholesale & Retail) WMC – WORK MANAGEMENT				

Source: Appendix F of Model Documentation, TERA Consultants analysis

TERA Consultants estimates that this categorisation of avoidable OPEX is performed correctly.

For each cost category that is defined as partially avoidable, the proportion of avoidability was estimated. It was done by considering costs and cost drivers at a more detailed level. The results are given in the table below.

Table 6. Example of avoidability estimation for indirect access OPEX

Code	Description	Avoidability level (%)	OPEX (€)	Justification for Categorisation
Cost of copper access				
GB101	Access Nwk. Overhead	✂%	✂	Network planning and design activity associated with local access infrastructure
GB102	Access Nwk. Underground	✂%	✂	Network planning and design activity associated with local access infrastructure
GF101	Access Nwk. Overhead	✂%	✂	Network operation and maintenance support associated with local access infrastructure
GF102	Access Nwk. Underground	✂%	✂	Network operation and maintenance support associated with local access infrastructure
GF122	Network Rates	✂%	✂	Network rates paid to local authorities
G#140	DC Power	✂%	✂	Network planning and design activity associated with power infrastructure
GF155	Network Plant Storm Maintenance	✂%	✂	Network operation and maintenance support associated with local access infrastructure
WMC	WORK MANAGEMENT	✂%	✂	Work management associated with local access activity
WPL	NETWORK PLANNING TIME	✂%	✂	Network planning and design activity associated with local access infrastructure
Dassnet - Leased Line Exchange equipment OPEX associated with Leased Line network elements for Martis and Dassnet Equipment				
GF122	Network Rates	✂%	✂	
GB123	Data Network - DASSNET	✂%	✂	
GF123	Data Network - DASSNET	✂%	✂	
GB140	DC Power	✂%	✂	
GF140	DC Power	✂%	✂	

Code	Description	Avoidability level (%)	OPEX (€)	Justification for Categorisation
WMC	Work Management Centre	✂%	✂	
DSL-DSLAM-4: Cost of DSLAM used for DSL services				
MMY	ASAM Mtce	✂%	✂	
GF122	Network Rates	✂%	✂	
GB126	Data Network - xDSL Network	✂%	✂	
MND	Nwk Mgt Centre	✂%	✂	
WMC	Work Management Centre	✂%	✂	
GB140	DC Power	✂%	✂	
GF140	DC Power	✂%	✂	
MXY	DC POWER	✂%	✂	
Costs of Provisioning: Activities reported within Leased Line Network Element in Core Network.				
CB103	Private Circuits	✂%	✂	
Leased Line Repair				
EA144	Bandwidth services - PPC	✂%	✂	
EB103	Private Circuits	✂%	✂	
Provisioning				
CB101	PSTN (Non-traffic)	✂%	✂	CMA Activity supporting PSTN Installation
CB102	ISDN (Non-traffic)	✂%	✂	CMA Activity supporting ISDN Installation
CB125	LLU (Co Location)	✂%	✂	CMA Activity supporting LLU Installation
CB126	DSL (Wholesale &	✂%	✂	CMA Activity supporting DSL Installation

Code	Description	Avoidability level (%)	OPEX (€)	Justification for Categorisation
	Retail)			
CB134	LLU (ULMP & Line Sharing)	✂%	✂	CMA Activity supporting LLU Installation
CB149	Access - bitstream	✂%	✂	CMA Activity supporting Bitstream Installation
CB150	CPS single billing - wholesale line rental	✂%	✂	CMA Activity supporting CPS WLR Installation
CD101	PSTN (Order handling)	✂%	✂	CMA Activity supporting PSTN Installation
IPC	PROVISIONING CONTROL	✂%	✂	CMA Activity supporting PSTN Installation
WMC	WORK MANAGEMENT	✂%	✂	Work Management Centre support for Provisioning Activities
Provisioning: Costs of Provisioning Activities reported within Business Specific costs				
GB103	CPE	✂%	✂	
CB106	CPE Standard	✂%	✂	
CB107	CPE Other	✂%	✂	
CB113	Repayable Works Orders	✂%	✂	
CB126	DSL (Wholesale & Retail)	✂%	✂	
WMC	WORK MANAGEMENT	✂%	✂	
Costs of Repair network elements within Access Network				
EA101	PSTN (Non-Traffic)	✂%	✂	CMA Repair activity for PSTN Access services
EA121	LLU (ULMP & Line Sharing)	✂%	✂	CMA Repair activity for LLU and Line Shares services
EA137	Access -	✂%	✂	CMA Repair activity for Bitstream

Code	Description	Avoidability level (%)	OPEX (€)	Justification for Categorisation
	bitstream			services
EA138	CPS single billing - wholesale line rental	✂%	✂	CMA Repair activity for CPS WLR services
EB101	PSTN (Non-Traffic)	✂%	✂	CMA Repair activity for PSTN services
EB102	ISDN (Non-Traffic)	✂%	✂	CMA Repair activity for ISDN services
EB120	DSL (Wholesale & Retail)	✂%	✂	CMA Repair activity for DSL services
EB121	LLU (ULMP & Line Sharing)	✂%	✂	CMA Repair activity for LLU services
JB116	Fault Handling	✂%	✂	CMA IT support for fault handling systems
WMC	WORK MANAGEMENT	✂%	✂	Work Management Centre support for Repair Activities
Subscriber Unit:	**Costs of element of Line Cards**			
GF122	Network Rates	✂%	✂	Network rates paid to local authorities
GB113	Network Management Systems	✂%	✂	Network planning and design activity associated with Network Management Systems
GB149	Switching network - edge	✂%	✂	Network planning and design activity associated with switching equip. at edge of network
GF113	Network Management Systems	✂%	✂	Network operation and maintenance support associated with Network Management Systems
GF149	Switching network - edge	✂%	✂	Network operation and maintenance support associated with switching equip. at edge of network
GB140	DC Power	✂%	✂	Network planning and design activity associated with power infrastructure
GF140	DC Power	✂%	✂	Network planning and design activity associated with power infrastructure
Various	Network	✂%	✂	Network operation and maintenance

Code	Description	Avoidability level (%)	OPEX (€)	Justification for Categorisation
	Management			support associated with Network Management Systems
WMC	Work Management Centre	✂%	✂	Work management associated with switching line cards

Source: cost files

Since the calculations of different avoidability values are not presented and many cost codes are not detailed, a conclusion on the level of avoidability for each particular cost category cannot be made. However, it does not compromise the net cost estimation since TERA Consultants has checked the main cost categories and agrees with the general principles of categorisation approach and with the examples given by eircom. In future applications TERA Consultants recommend further detail is provided.

Efficiency adjustments

eircom has chosen to make efficiency adjustments based on LFI (line fault index): they make downward adjustments of cost since the average national LFI of eircom is higher than the one recommended by ComReg.

Costs corresponding to the following maintenance activities were adjusted:

- 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.

The following is used:

- The target national average LFI of 14.5% (ComReg D02/08),
- The actual national average LFI of 14.9%,
- Actual LFI for each MDF,
- Predicted LFI for each MDF.

First, the repair related OPEX values for all MDFs is multiplied by

———

Second, an additional correction is made for the areas where the LFI is particularly high. It was measured using a regression. According to the regression, LFI of each MDF increases with the percentage carriers and percentage cables on poles; it decreases with the number of working lines, percentage DSL and housing density. The actual LFI in the area is considered an outlier if it is higher than the one predicted by the regression plus standard deviation. ✂ such areas were identified.

If there is no explanation for inefficiency, then an adjustment is made to bring the actual LFI level down to the predicted LFI plus deviation. The multiplication factor for an MDF *j* is

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For ✂ out of ✂ MDFs such correction was not made since there was an explanation of their inefficiency, main reasons including

- lightening damage,
- third party damage,
- cable theft.

As a result, only ✂ MDFs needed an additional adjustment.

Note that since two adjustments are made, the resulting national average LFI becomes ✂% which is ✂ than target 14.5%.

In general, TERA Consultants approves the efficiency adjustment approach based on the target rate of LFI.

TERA Consultants agrees with efficiency adjustments of OPEX.

1.2.1.2 CAPEX

Access network CAPEX include cable, poles, ducts, radio access, etc. The data reflects the actual depreciation profile.

Avoidability

For most cost categories the value was captured in the accounts by MDF level, which makes avoidable cost at MDF level easy to estimate. For the remaining costs allocation keys were adopted.

Avoidability analysis at a customer level is more complicated.

The following costs are always avoidable at the customer level:

- the cost of the final drop;
- the cost of duct and / or pole used by the final drop;
- the line card;
- cost of equipment and cost of services that may be directly related to the provision of service to the customer.

Additionally, parts of network may become unnecessary, especially if a customer is located in a rural area.

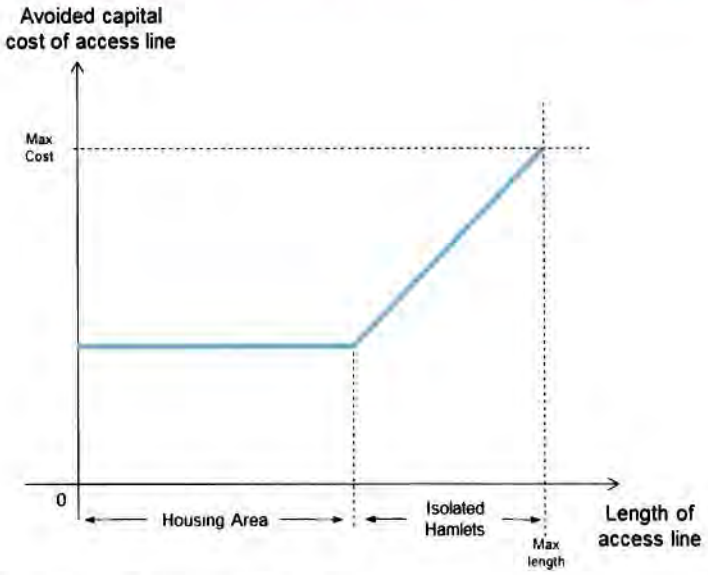
For distance sensitive costs, avoidable costs are calculated using CAM model. CAM model distinguishes between densely populated housing areas and isolated houses. Costs specific to a customer include final drop and additionally the dedicated part of the linkage only for isolated houses. The use of CAM to calculate cost is not recommended by ComReg since the cost will not be representative of the actual cost (3.122 of the

Decision D04/11). CAM is used just to determine which assets would be avoided. The following data was taken from CAM:

- Number of customers in housing areas and in isolated houses
- Size of the housing area
- Line length distribution

The cost of a line in housing area is not sensitive to the line length (final drop and line card) while the cost of a line in isolated housing includes both fixed component (final drop and line card) and variable component (cost of the line proportional to the distance between the isolated house and the closest border of the housing area).

Figure 3. Example of avoidability function for access capital costs.



Source: Figure 3-2 of Model Documentation

Usually, overhead network is used in the areas with lower line density than the underground network and so would be expected to have a relatively higher level of avoidability.

The following assumptions were made regarding non-distance sensitive capital costs. Line cards are fully avoidable at customer level. A share of pair gain is regarded as avoidable both inside and outside housing areas. Other non-distance sensitive costs are unavoidable.

Service specific capital costs are considered as fully avoidable. They include:

- PSTN:
  - 2784 - CPE for PRA's and FRA's
- Leased Lines:
  - 2314 - DS-Multiplex Equipment
  - 2318 - DS-OPS Support System
  - 2321 - MARTIS
  - 2786 - CPE for 2 MB DPLs
  - 2788 - CPE for N*64kb DPLs
- DSL:
  - 2324 - DSL Ports and Installation

- 2770 - BA NE ADSL Equipment
- Supplementary:
- 2782 - Business IP only Network Equipment
- Transport

Leased lines are excluded from Customer Model.

The table below summarises avoidability category for different cost categories.

Table 7. Categorisation of access CAPEX by degree of avoidability

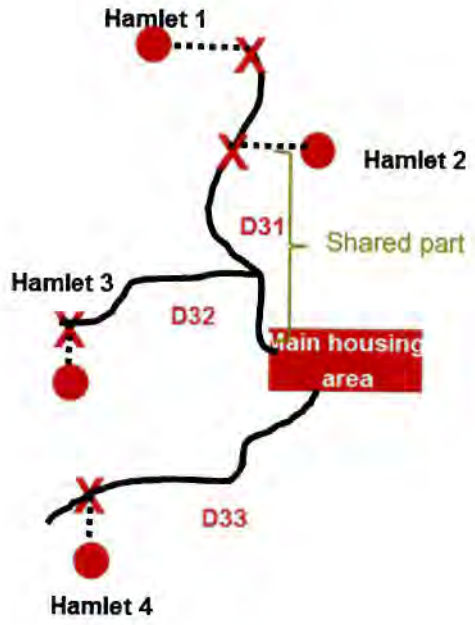
Cost Category	OPEX Codes / Asset Class	Cost driver	Housing Area	Isolated Housing	TERA Consultants' evaluation
Final Drop	Calculated value based on CAM, no asset class available	Per Line	Fully Avoidable	Fully Avoidable	TERA Consultants agrees with the assigned category
Line Card	1310 -Sw.Exch.Line Termns.	Per Line	Fully Avoidable	Fully Avoidable	TERA Consultants agrees with the assigned category
Service specific CAPEX	2314 – DS-Multiplex Equip.* 2318 – DS-OPS Support Syst.* 2321 – "MARTIS" 2323 – Broadband Access Ser 2324 – DSL Ports & Inst 2327 – Data Services – ATM* 2514 – Eirpac - Frame Relay* 2770 – BA NE ADSL Equipment 2782 – Business IP only Network Equipment* *Leased line and supplementary service categories excluded in version 1.1	Per Line	Fully Avoidable	Fully Avoidable	TERA Consultants agrees with the assigned category
Other customer specific	1140 – LN-Pair Gains System	Per Line	Un-avoidable	Fully Avoidable	TERA Consultants agrees with the assigned category
Non-distance Dependent CAPEX	1150 – LN -Line Testing Eq. 1170 – LN-Network Protn. 1328 – Sw. – Power 7010 – Generators	Per Line	Un-avoidable	Un-avoidable	TERA Consultants agrees with the assigned category
Distance Dependent Overhead Cable CAPEX	1114 - LN -O/H Copper Cable' 1116 – LN-Poles 1556 – Tx. Junction – Poles	Per km	Un-avoidable	Partially Avoidable, only portion of line outside housing area.	See discussion below.

Cost Category	OPEX Codes / Asset Class	Cost driver	Housing Area	Isolated Housing	TERA Consultants' evaluation
Distance Dependent CAPEX	1124 – LN -U/G Copper Cable 1126 – LN-Ploughed-in Cable 1128 – LN-Duct, Boxes, Civils 1130 – LN - Radio Access 1528 – Tx. Trunk Civils 1548 – Tx. Junction Civils 2728 – BA CN Duct & Boxes	Per km	Un-avoidable	Partially Avoidable, increasing avoidability for increasing line length but only for portion outside housing area.	See discussion below.

Source: Appendix F of Model Documentation, TERA Consultants analysis

A part of cable outside the housing area is shared which means that the cost of the corresponding copper line is not fully avoidable. This is illustrated on the figure below where the shared part is not avoidable in the case only Hamlet 2 or only Hamlet 1 is disconnected.

Figure 4. Illustrating shared access CAPEX



Source: CAM presentation

Such configuration where isolated houses are located along the same road is wide spread in Ireland as illustrated on the figure below. The cables near these routes are often shared.

Figure 5. Illustrating location of isolated houses in Ireland

In brown - housing areas, in yellow, red or orange - isolated houses

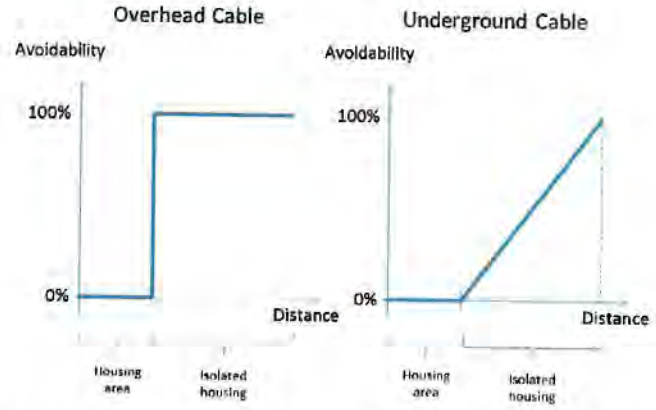
Source: CAM presentation

Access CAPEX of isolated houses is likely to be shared to a significant degree.

To address the issue of cable sharing, eircom makes the following simplifying assumptions.

In practice, the overhead network in an MDF area will have a lower line density than the underground network and so would be expected to have a relatively higher level of avoidability. That is why in eircom's model avoidability varies with cable type: overhead cable is fully avoidable outside housing area and underground cable is only partially avoidable. For an overhead cable in isolated areas it is only the portion of the cable that is outside the housing area that is avoidable, the portion of the line that is in the housing area is not avoidable. For underground cable outside the housing area, avoidability increases with line length. Hence, at the edge of the MDF boundary underground cable is fully avoidable, but at the edge of the housing area it is unavoidable. It is illustrated on the graph below.

Figure 6. Illustration of cable avoidability



Source: WIK-Consult, Response to Comreg on certain costing issues pertaining to the USO net cost model, 31 May 2012

TERA Consultants agrees that the eircom's approach to separately treat overhead and underground cable is reasonable given the data availability and the level of model complexity. However, it will be useful to check whether this assumption gives realistic cost curved based on field studies and CAM for the estimation of the net cost for future years. We recommend to do this by constructing the cost function for several representative MDFs, based on a bottom-up approach (such as the existing copper access model) and, if required, sites visits. Such procedure is recommended to be repeated for each USO cost assessment period.

eircom's modelling approach and the estimation of avoidable costs appears to be reasonable and in line with the decision. For future assessments, TERA Consultants recommend the results on several representative MDFs are verified, reflecting the methodology prescribed by ComReg.

1.2.2 Core network cost

Costs of the core network per minute or per call are determined on the national average basis. Cost-volume relationships are used, where minimum point corresponds to the thinned network, where only one unit of each service is provided to each customer. Cost volume relationships were estimated either from the latest Top-Down LRIC model of eircom of 2009/08, or from a BT report of 2011.[11]

Depending on the cost category, avoidability level is estimated in different ways:

- for common costs, it is equal to 0%;

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

- for direct CAPEX, avoidability is estimated from CVR which is taken either from the latest Top-Down LRIC model of eircom of 2009/08, or from a BT report of 2011;
- for indirect CAPEX, avoidability level is equal to the weighted average avoidability level of the corresponding direct CAPEX;
- for direct OPEX, avoidability level is equal to the weighted average avoidablity levels of the corresponding direct and indirect CAPEX. Additionally, the second adjustment is made for some direct OPEX to account for second-order volume effect;
- for indirect OPEX, avoidability level is equal to the weighted average avoidablity level of the corresponding CAPEX and direct OPEX.

The table below presents the list of costs and their level of avoidability. For each cost, TERA Consultants assesses the avoidability level estimated by eircom.

Table 8. Cost volume relationships for core costs

Cost Category	OPEX/ CAPEX	Direct/ Indirect/ Common	Cost (€)	Cost (% of total)	avoidable %	Source
ACC-FIBRE	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
DUCT	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
POLES	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
ACC-NETW-MAIN	OPEX	Common	✂	✂%	**0%**	0% for common
LAND&BUILDING-MAIN	OPEX	Indirect	✂	✂%	✂%	Average of corresponding CAPEX and direct OPEX
CUST-PREMISES-EQPT-MAINT	OPEX	Common	✂	✂%	**0%**	0% for common
MISCELLANEOUS-MAIN	OPEX	Common	✂	✂%	**0%**	0% for common
NETW-MNG-SYS-MAINT	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
OFFICE-MAINT	OPEX	Common	✂	✂%	**0%**	0% for common
RESEARCH&DEVELOPMENT-MAINT	OPEX	Common	✂	✂%	✂%	0% for common
POWER-MAINT	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
IC-EXCH-EQPT-INSTALL	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
SWITCH-MAINT	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
TRANS-CIRCUIT-INSTALL	OPEX	Indirect	✂	✂%	✂%	Average of corresponding CAPEX and direct OPEX
TRANS-NETW-EQPT-INSTALL	OPEX	Indirect	✂	✂%	✂%	Average of corresponding CAPEX and direct OPEX
CORE-RADIO-MAINT	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX

Cost Category	OPEX/ CAPEX	Direct/ Indirect/ Common	Cost (€)	Cost (% of total)	avoidable %	Source
CORE-CABLE-MAINT	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
TRANS-NETW-EQPT-MAIN	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
BILLING-CDCS-CMA	OPEX	Common	✂	✂%	0%	0% for common
CORP-COM	OPEX	Common	✂	✂%	0%	0% for common
CORP-SERV	OPEX	Common	✂	✂%	0%	0% for common
FINANCE	OPEX	Common	✂	✂%	0%	0% for common
IT-OTHER	OPEX	Common	✂	✂%	0%	0% for common
MNG-BUS	OPEX	Common	✂	✂%	0%	0% for common
MNG-NETW-SWITCH-TRANS	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
MNG-NETW-OTHER-CORE	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
MNG-NETW-ACCESS	OPEX	Direct	✂	✂%	✂%	Average of corresponding CAPEX
MNG-NETW-APPROP	OPEX	Common	✂	✂%	0%	0% for common
PEOPLE	OPEX	Common	✂	✂%	0%	0% for common
PROCURE	OPEX	Common	✂	✂%	0%	0% for common
PROVISION	OPEX	Common	✂	✂%	0%	0% for common
PROVISION-OLO	OPEX	Common	✂	✂%	0%	0% for common
REPAIR	OPEX	Common	✂	✂%	0%	0% for common
DASSNET-NMC	CAPEX	Indirect	✂	✂%	✂%	Average of corresponding direct CAPEX
NETW-LAND&BUILD	CAPEX	Indirect	✂	✂%	✂%	Average of corresponding direct CAPEX
OTHER-INDIRECT-LABOUR	OPEX	Common	✂	✂%	0%	0% for common
NETW-STORES	OPEX	Common	✂	✂%	0%	0% for common

Cost Category	OPEX/ CAPEX	Direct/ Indirect/ Common	Cost (€)	Cost (% of total)	avoidable %	Source
NETW-MNG-SYS	CAPEX	Indirect	✂	✂%	✂%	Average of corresponding direct CAPEX
ANCIL-EXCH-EQPT	CAPEX	Indirect	✂	✂%	✂%	Average of corresponding direct CAPEX
CONCENTRATORS-AXE	CAPEX	Direct	✂	✂%	**17%**	BT model
CONCENTRATORS-E10	CAPEX	Direct	✂	✂%	**20%**	BT model
NETW-POWER-PLANT	CAPEX	Indirect	✂	✂%	✂%	Average of corresponding direct CAPEX
PRIM-SWITCH-AXE-1312	CAPEX	Direct	✂	✂%	**24%**	BT model
PRIM-SWITCH-AXE-1314	CAPEX	Direct	✂	✂%	**24%**	BT model
PRIM-SWITCH-AXE-1316	CAPEX	Direct	✂	✂%	**24%**	BT model
PRIM-SWITCH-E10-1312	CAPEX	Direct	✂	✂%	**25%**	BT model
PRIM-SWITCH-E10-1314	CAPEX	Direct	✂	✂%	**25%**	BT model
PRIM-SWITCH-E10-1316	CAPEX	Direct	✂	✂%	**25%**	BT model
SEC-SWITCH-AXE-1312	CAPEX	Direct	✂	✂%	**24%**	BT model
SEC-SWITCH-AXE-1314	CAPEX	Direct	✂	✂%	**24%**	BT model
SEC-SWITCH-AXE-1316	CAPEX	Direct	✂	✂%	**24%**	BT model
SEC-SWITCH-E10-1312	CAPEX	Direct	✂	✂%	**25%**	BT model
SEC-SWITCH-E10-1314	CAPEX	Direct	✂	✂%	**25%**	BT model
SEC-SWITCH-E10-1316	CAPEX	Direct	✂	✂%	**25%**	BT model
SWITCH-NETW-MNG-SYS	CAPEX	Direct	✂	✂%	**0%**	BT model
TERTIARY-SWITCH-1312	CAPEX	Direct	✂	✂%	**25%**	BT model
TERTIARY-SWITCH-1314	CAPEX	Direct	✂	✂%	**25%**	BT model
TERTIARY-SWITCH-1316	CAPEX	Direct	✂	✂%	**25%**	BT model
TRANS-NETW-EQPT-DWDM	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
CORE-RADIO-SYS	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
CORE-FIBRE-	CAPEX	Direct	✂	✂%	✂%	eircom LRIC

Cost Category	OPEX/ CAPEX	Direct/ Indirect/ Common	Cost (€)	Cost (% of total)	avoidable %	Source
CABLE						model
CORE-COPPER-CABLE	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANS-NETW-MNG-SYS	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANS-NETW-EQPT-PCMEQPTMEN	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANS-NETW-EQPT-PDH	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANS-NETW-EQPT-HDSLEQPTME	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANS-NETW-EQPT-CROSSCONNECT	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANS-NETW-EQPT-MISC	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANS-NETW-EQPT-SDHEQPTTE	CAPEX	Direct	✂	✂%	✂%	eircom LRIC model
TRANSPORT	OPEX	Indirect	✂	✂%	✂%	Average of corresponding CAPEX and direct OPEX
OTHER	OPEX	Common	✂	✂%	**0%**	0% for common
EXEMPT	OPEX	Common	✂	✂%	**0%**	0% for common
EXMPT	OPEX	Common	✂	✂%	**0%**	0% for common
EXCPT	OPEX	Common	✂	✂%	**0%**	0% for common
ACCOMMODATION	OPEX	Common	✂	✂%	**0%**	0% for common
Pension	OPEX	Indirect	✂	✂%	✂%	Average of corresponding CAPEX and direct OPEX

Source: ✂, TERA Consultants analysis

Service unit cost per call and per minute is calculated using routing factors that measure the propensity of different call services to use different network elements.

TERA Consultants notes that avoidability is assessed using only one point of minimal traffic volume. It is supposed that cost increases linearly between this minimal point

and the maximal point. However, the cost curve between minimal and maximal points is not linear.

Where information was available, TERA Consultants has compared the real cost curve with the linear curve to assess the impact of the linear hypothesis.

The table below presents data extracted from the BT model. [12]

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

Table 9. Cost volume relationships for core costs from BT source

Legend

Orange cells	avoidable costs used by the cost model
Red cells	avoidable costs based on the smallest increment are lower than the ones used by eircom
Green cells	avoidable costs based on the smallest increment are higher than the ones used by eircom

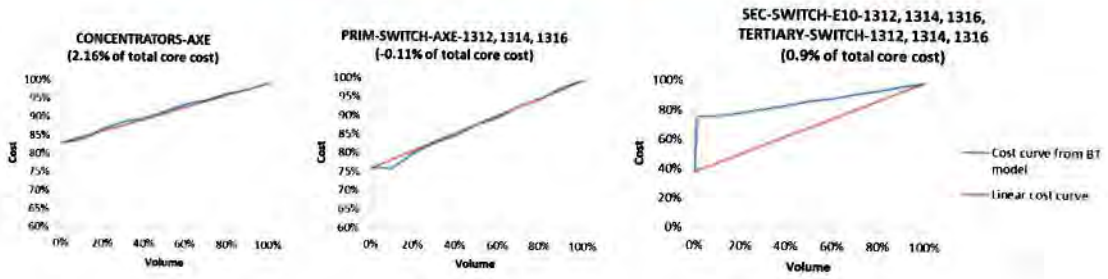
Source: BT LRIC Documentation 2010

		Largest increment			Smallest increment		
Number	Description	Fixed cost	Avoidable cost	Average	Volume	Cost	Avoidable cost
CV001	Access Fibre Cable	92%	8%		75%	99%	4%
CV002	Local Lines Copper Cable	57%	43%		75%	92%	32%
CV003	Duct: local access	97%	3%		0%	97%	3%
CV004	Local Exchanges: Digital, System X Concentrator – Lines	44%	56%		90%	95%	50%
CV005	Local Exchanges: Digital, System X Concentrator – Traffic volume	77%	23%		90%	98%	20%
CV006	Local Exchanges: Digital, AXE10 Concentrator – Lines	23%	77%		90%	94%	60%
CV007	Local Exchanges: Digital, AXE10 Concentrator – Traffic volume	83%	17%	20%	90%	98%	20%
CV010	Local Exchanges: Digital, UXD5 – Lines	37%	63%		90%	94%	60%
CV011	Local Exchanges: Digital, UXD5 – Traffic volume	79%	21%		90%	98%	20%
CV019	Core transmission cable (fibre)	18%	82%		0%	18%	82%
CV022	Core Transmission equipment - PDH / SDH	17%	83%		0%	17%	83%
CV025	Duct: core transmission	92%	8%		0%	92%	8%
CV029	Computer Fixed Assets and Depreciation	0%	100%		80%	83%	85%
CV030	Power Plant	24%	76%		90%	93%	67%
CV104	Payphones	0%	100%		0%	0%	100%
CV129	Kilostream Switches	8%	92%		0%	8%	92%
CV130	Private Circuits 2Mbit (Megastream Equipment)	2%	98%		0%	2%	98%
CV133	Apparatus	0%	100%		0%	0%	100%
CV144	Other Private Circuits	0%	100%		0%	0%	100%
CV145	SMDS Switching	24%	76%		0%	24%	76%
CV149	Repayment Works	0%	100%		0%	0%	100%
CV150	Storm Costs	0%	100%		0%	0%	100%
CV155	Topographic Charges	0%	100%		0%	0%	100%
CV156	POLOs and POAs	0%	100%		0%	0%	100%
CV158	Retail and Other	0%	100%		0%	0%	100%
CV159	Customer works	0%	100%		0%	0%	100%
CV160	Field Support Operations	0%	100%		0%	0%	100%
CV161	Installation Control	0%	100%		0%	0%	100%
CV162	Other Support Activities	0%	100%		0%	0%	100%
CV168	General Management & Other	2%	98%		95%	95%	100%
CV169	General Management & Other, legal charges & other fees	15%	85%		0%	15%	85%
CV170	Motor Transport, fixed assets and depreciation	0%	100%		80%	85%	75%
CV171	Motor Transport, licenses	0%	100%		0%	0%	100%
CV172	Motor Transport, fuel	0%	100%		0%	0%	100%
CV173	Motor Transport, Other	0%	100%		0%	0%	100%
CV174	Personnel and administration	0%	100%		95%	95%	96%
CV180	Trading stocks	0%	100%		0%	0%	100%
CV181	Provisions	0%	100%		0%	0%	100%
CV182	Pension provisions	0%	100%		0%	0%	100%
CV185	Short term interest	0%	100%		0%	0%	100%
CV189	Per Cent Club	0%	100%		0%	0%	100%
CV190	Own use	0%	100%		0%	0%	100%
CV191	Provision and Installation	0%	100%		0%	0%	100%
CV193	Office Machines	0%	100%		80%	83%	85%
CV194	Operator Assistance - BT Pay	21%	79%		0%	21%	79%
CV198	Operator Services Agency Costs	0%	100%		0%	0%	100%
CV199	Insurance	15%	85%		95%	98%	40%
CV200	Pay Accounting & Management Services Costs	0%	100%		0%	0%	100%
CV202	Accrued Income	0%	100%		0%	0%	100%
CV204	Other computing costs	0%	100%		80%	86%	70%
CV207	Sales and Marketing costs	0%	100%		0%	0%	100%
CV208	Other finance and billing costs	0%	100%		95%	95%	100%
CV210	Other debtors	0%	100%		0%	0%	100%
CV212	Non-Pay Accounting & Management Services Costs	0%	100%		0%	0%	100%
CV216	Transfer charges	0%	100%		0%	0%	100%
CV219	Local Exchanges: Digital, AXE10 Processor	76%	24%		90%	98%	20%
CV220	Local Exchanges: Digital, System X Processor	75%	25%	24,5%	90%	97%	30%
CV224	Advanced Switching Units (formerly ASU)	36%	64%		0%	36%	64%
CV225	Universal Card Platform (formally known as Cashless platform)	91%	9%		0%	91%	9%
CV226	Circuit Provision activity - PSTN Traffic	0%	100%		0%	0%	100%
CV227	Intelligent Network	53%	47%		0%	53%	47%
CV228	Non Voice	0%	100%		0%	0%	100%
CV230	Telex Exchanges and Transmission	46%	54%		90%	95%	50%
CV232	Maintenance of local lines overhead plant.	0%	100%		0%	0%	100%
CV233	Maintenance of electronic equipment associated with local lines me	0%	100%		0%	0%	100%
CV237	Earth Stations Broadcast	73%	27%		0%	73%	27%
CV241	Income	0%	100%		0%	0%	100%

Source: BT LRIC documentation 2010

The figure below presents cost as a function of call volume for those cost categories for which such detailed information is available. Cost curve sourced from the BT model is compared to a linear cost curve used by BT.

Figure 7. Cost volume relationships for core costs from BT source



No bias | No bias | Net cost over-estimation

Source: ✂

For the first two cost categories, the cost curve as estimated by BT is close to the one estimated by eircom, that is why the divergence in net cost estimation is insignificant. For the third cost category, the cost curve estimated by BT is significantly higher than the one estimated by eircom, that is why the avoided cost and correspondingly the net cost are over-estimated.

It was impossible to make the same analysis for cost categories taken from the eircom model since the cost curve for most cost categories was not available. It was possible to make such analysis only for one cost category – Billing-CDCS-CMA. The cost curve is significantly different from linear.

Figure 8. ✂

✂

Source: ✂

The following cost categories are not used in the model, but they give an example of possible cost curve forms and shows that the cost curve is often different from linear.

Figure 9. ✂

Source: ✂

To make net cost estimation more precise, it is better to use not the greatest increment where only minimal traffic volume is maintained but smaller increments. Using one of the examples above, it means to take only the end of the cost curve which makes estimation more realistic. Indeed, according to the results of the model, only ✂% of the lines are disconnected in the hypothetical scenario where USO does not exist. It is a very small increment.

Figure 10. ✂

Source: ✂

eircom states that it is difficult to make such a calculation because of the interdependence where the segment of the cost curve to be chosen depends on the number of uneconomic users, which in its turn depends on the cost. That is why the point on the curve may need to be found by iterations which makes the calculation more complex. However, TERA Consultants states that it seems to be appropriate to make calculations on the last curve segment with the smallest increment of ✂% because it is unlikely that the proportion of uneconomic users and the corresponding traffic ✂ ✂%.

Following the response by eircom, TERA Consultants agrees that the assumption of the linearity does not change the final result significantly for the few CVRs for which information on the cost form was available. No information on cost curves of other assets is available.

eircom makes the assumption that core cost curves are linear. To make the estimation more robust, minimal increments may be used instead of using maximal increment of the cost curves. However, this modification does not change the result significantly and does not compromise the estimation.

1.3 Area Model

Uneconomic areas are defined on the MDF level by comparing costs with revenue. Calculation is made in several steps:

1. Estimate costs and revenue for each MDF and determine the preliminary list of uneconomic MDFs.
2. Deduce 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 link economic and uneconomic area, revenue should be attributed to the uneconomic one.
4. Add replacement revenues.

TERA Consultants estimates that given the technical difficulty of the calculation, chosen calculation procedure in several steps is appropriate and does not lead to a bias. The result is accurate only subject to correct cost and revenue data which were discussed earlier.

TERA Consultants estimates that the calculation method used in the Area Model is appropriate.

1.4 Customer Model

Since information on each customer cannot be identified, a probability-based approach was adopted.

First, the net revenue distribution of customers in each area is estimated.

Second, the avoidable access cost distribution of customers in each area is estimated. The cost of line is estimated as a function of its length, so that all lines may be classified by increasing length and cost.

eircom has checked on a statistical sample that there is almost no correlation between line length and line revenue.

To find the number of uneconomic customers, for each net revenue interval eircom has estimated the probability that the cost is lower than the average revenue value of the interval. The expected net cost is equal to the average expected cost minus the average revenue value of the interval.

Once the first estimation of the uneconomic customer number is made, an iterative process follows. As traffic to these customers is eliminated, revenue from all areas decreases accordingly.

ComReg prescribes in D04/11 that the revenue from calls between uneconomic and economic customers should be allocated to the uneconomic one. This rule is not strictly respected since the model is probabilistic and does not allow for identification of uneconomic customers.

An important hypothesis that is the basis of the estimation is the absence of correlation between the revenue per line and the cost per line which depends on the line length. eircom has provided additional note that contains details on statistical analysis that have been done to substantiate this assumption.

The length of lines was estimated as the capacitance to earth divided[13] by 0.06 and using data from the Line Test System. 798 DSL MDFs were tested for which the data was available. Then the revenue from the Customer Model was regressed on the line length. Pearson's coefficient has been chosen as a criterion. Correlations were made on different groups of MDFs:

- all the MDFs,
- each individual MDF,
- economic MDFs only,
- uneconomic MDFs only,
- lines within particular distance interval,
- lines within particular size intervals.

[13] Capacitance to earth is one of electrical parameters that indicate the health of a telephone line. It has a direct relationship with the line length. Access network telecoms cable typically has a capacitance to earth of 0.06 micro Farad / km.

The Pearson's coefficient is found to be close to zero and slightly negative in the overall regression and it is also close to zero for most of MDFs. This result does not change significantly if outliers are removed. Consequently, no strong evidence of correlation has been found.

TERA Consultants estimates that given complexity of the task, the probabilistic method is appropriate.

TERA Consultants estimates that the calculation method used in the Customer Model is appropriate.

1.5 Payphone Model

The Payphone Model considers only USO payphones – those accessible to the general public as required by ComReg Information Notice 06/14 "Universal Service Obligation – Removal/Relocation of Public Pay Telephones".

According to the decision 16 of D04/11, the net cost of uneconomic payphones that are not mandatory should not be counted. eircom explains that more than 2,000 payphones were removed in 2007-2009, which shows that uneconomic payphones were removed where it was not objected and the level of payphone deployment is not excessive.

1.5.1 Revenue

Revenues include:

- call card revenue, coin revenue, credit card revenue, payphone access charge revenue, for which data per payphone is available;
- advertising revenue, for which only national level data is available;
- WIFI revenue, for which only national level data is available.

To allocate advertising revenue, first, eircom has identified those payphones that are likely to generate advertising revenue because of their location; second, eircom has divided the total advertising revenue by the number of such payphones.

To allocate WIFI revenue, eircom divides the total value by the number of WIFI enabled payphones.

TERA Consultants agrees with the revenue categories and allocation keys.

1.5.2 Cost

The avoided cost of one payphone consists of two main components:

- Cost of the line equal to the average cost of the line of the MDF is available from the Area Model.
- Payphone-specific costs (repair, maintenance, cleaning, coin collection, etc.) are not available on the payphone level since the maintenance costs are contracted out and a fixed annual amount is paid. Allocation is made in proportion of average operating costs for access lines within MDF.
- Core network calling costs are calculated in proportion of traffic per payphone.
- Costs related to WIFI are based on the cost of Bitstream access per line within the relevant MDF area sourced from the Area Model.

TERA Consultants agrees with the cost categories and with allocation keys.

1.5.3 Identifying uneconomic payphones and net cost calculation

Payphones with a negative net cost are considered as uneconomic. Only uneconomic payphones locates in economic areas contribute to the net cost of the Payphone Model. Including uneconomic payphones in uneconomic areas would entail double counting with the Area Model.

TERA Consultants agrees with the general principles of calculating the net cost of payphones.

TERA Consultants estimates that the payphone net cost calculation method is appropriate.

1.6 Directory Enquiry Service and Directories Model

USO obligation related to directories enquiry services include:

- provide end-users with a comprehensive printed directory of subscribers, free-of-charge, and updated at least once a year; and
- keep a record in the National Directory Database of all subscribers of publicly available telephone services in Ireland (including those who have not refused to be included in that record) and allow access to any information contained in such a record to any such other undertaking, or any person.

The printed directory business is outsourced to ✂ by eircom. eircom receives annual revenues:

✂

The only costs incurred by eircom are:

✂

As a result, since the cost of 2009/10 financial year was ✂, the net cost for this obligation is ✂.

It is not clear why the payments made by eircom for brand positioning is included in costs. Indeed, these payments are compensated by the advertisement benefit received by eircom. If these payments are included, then the corresponding marketing intangible benefit of branding and logo display should be also counted. ✂

TERA Consultants agrees with the net cost estimation method for directory services.

TERA Consultants advises not to count payments for brand positioning as an avoidable cost. ✂

Costs and revenues of National Directory Database were not included in the cost calculation and should be included for future assessments.

1.7 Disabled Services Model

USO obligations related to disabled services include:

- provide a dedicated section of its website with information on the services that it provides 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; users who are hearing and/or speech impaired; users with limited dexterity or mobility; users with restricted vision and users unable to use the phone book due to a disability.

Table 10. Calculating the net cost of disabled services components

Service	Description	Associated costs and revenues
text relay	translation of voice messages into text and the sending of that text to the phone of the customer or of the operator and vice versa. To account for the additional time it takes to make a text telephone call, users can receive a rebate of up to 70% of the cost of phone calls.	1. Operating costs are based on an hourly cost of an operator, the availability per day and time spent on text relay. In 2009/10 training costs were also incurred. 2. Traffic costs are calculated based on the recorded calls during the financial year, an average call length and an avoided cost per call (for DQ Retail) and per minute based on the core network unit cost analysis. 3. Rebate of the cost of phone calls 4. ✂. ✂.
specialised equipment	supply a range of phones with features that may be of benefit to customers with special needs	Specialised equipment generates ✂ and ✂. ✂
free directory enquiry	provide free directory enquires for customers that cannot use the phonebook due to a sensory or physical disability or medical condition.	1. Traffic costs are calculated based on the recorded calls during the financial year, an average call length and an avoided cost per call (for DQ Retail) and per minute based on the core network unit cost analysis. 2. Operating the service requires the equivalent of ✂ full time employees at a cost of €✂of which only ✂% is assumed dedicated to provision of free directory enquiry. In addition, annualised capital costs related to the free directory service incurred in financial year 2009/10 is included. ✂. Wholesale revenue is equal to €✂.

braille and reading bills	On-line viewing of bills, listening to the bill balance and the last amount paid through an automated service or speaking with an agent and provision of bills in Braille.	1. Cost of printing bills in Braille by an external printer €✂per bill in 2009/10. 2. Additional postage cost €✂. ✂.

Source: Model documentation

The net cost of disabled services is equal to €44,651.

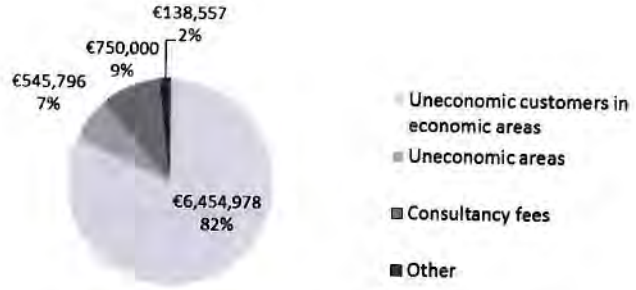
TERA Consultants estimates that the calculation method of net cost generated by disabled services is appropriate for text relay, free directory inquiry and Braille bills and for specialised equipment.

2 Numerical analysis

2.1 Model results

The total net cost was estimated by eircom, to be €7,889,331 before intangible benefits in the model. The biggest part of this cost is generated by uneconomic customers; uneconomic areas generate 7% of the net cost, other model components - less than 2%.

Figure 11. Net cost structure



Source: ✂ TERA Consultants analysis

TERA Consultants did not undertake a review of the consultants' fees.

Among ✂MDF areas, ✂% contain uneconomic lines. At the same time, the number of uneconomic lines is low: they constitute only ✂% of the total number of lines.

Figure 12. ✂

✂

Source: ✂

Uneconomic customers generate 82% of the net cost.

2.2 Revealing outlying MDFs

TERA Consultants has analysed more in details several MDFs that are significantly different from the average. Analysis of these MDFs can allow making more general conclusions on the cost structure and revealing possible calculation errors.

2.2.1 Area Model

TERA Consultants has compared MDFs based on several criteria in order to reveal MDFs that are significantly different from the average. The figure below shows distribution of MDFs according to their net cost, net cost per line, cost per line and revenue per line.

Figure 13. ✂

Source: ✂

It shows that the two MDFs that are remarkably different from others are ✂ and ✂. Two MDFs have both the total high net cost and per line high net cost. ✂ high net cost is mostly explained by a high cost per line. ✂ high net cost is mostly explained by low revenue per line.

2.2.2 Customer Model

Similarly, MDFs containing uneconomic lines were mapped according to their net cost and also proportion of uneconomic lines in an MDF.

Figure 14. ✂

✂

Source: ✂

The following MDFs need to be checked: ✂ with the ✂ total cost, ✂ with the ✂ cost per line and ✂ with the ✂ number of uneconomic customers.

Several MDFs were identified for further analysis.

2.3 Analysis of net cost structure

The following table presents decomposition of net cost in core cost, core revenue, access cost and access revenue. To make MDFs of different size comparable, values per one ISDN line are given.

Their cost structure was compared with the cost structure of an average MDF.

Table 11. ✂

✂

Source: ✂

Access cost constitutes a more significant part of the total cost than the core cost. Uneconomic MDFs are characterised by an access cost which is ✂ times higher than the access cost of an average line. Access cost revenue of these MDFs is ✂% lower than the average access revenue per line. It may be concluded that the main reason for an area to be uneconomic is high access cost.

The table below proposes a decomposition of the access cost by service. PSTN is the service that makes the biggest contribution to the final access cost, the impact of DSL-R (retail) and SB-WLR (wholesale line rental) being as well significant.

Table 12. ✂

✂

Source: ✂

High net cost is mostly due to high access cost per line.

2.4 Analysis of the chosen MDFs

2.4.1 Area Model

2.4.1.1 ✂

Table 11 shows that the access cost per line of the MDF ✂ is ✂ times higher than that of an average MDF and even ✂% higher than that of an uneconomic MDF. Decomposition of access cost shows that costs that correspond to PSTN and SB-WLR should be studied further. The figure below shows decomposition of these costs.

Figure 15. ✂

✂

Source: ✂

The access cost for ✂ is particularly high because of high distance sensitive OPEX, preventive maintenance, and more exactly "Pole Testing" ✂ and "Bucket W/O ✂ spend".[14] A possible explanation of such a high cost is severe weather conditions: exposed terrain, wind and lightning storms, preventative maintenance programme in 2009/10.

Attention should be paid for cost categories that are high only during one particular year but are low during other years.

Attention should be paid for cost categories that are high only during one particular year but are low during other years.

2.4.1.2 ✂

MDF ✂ is characterised by high access cost per line and also by low revenue (see Table 11). The access cost is almost ✂ times ✂ than the access cost of an average MDF and it is mostly driven by the cost of PSTN and SB-WLR (see Table 12). This cost is high mainly due to a high distance sensitive OPEX which is explained by relatively high number of long lines.

[14] Source: ✂

Figure 16. ✂

✂

Source: ✂

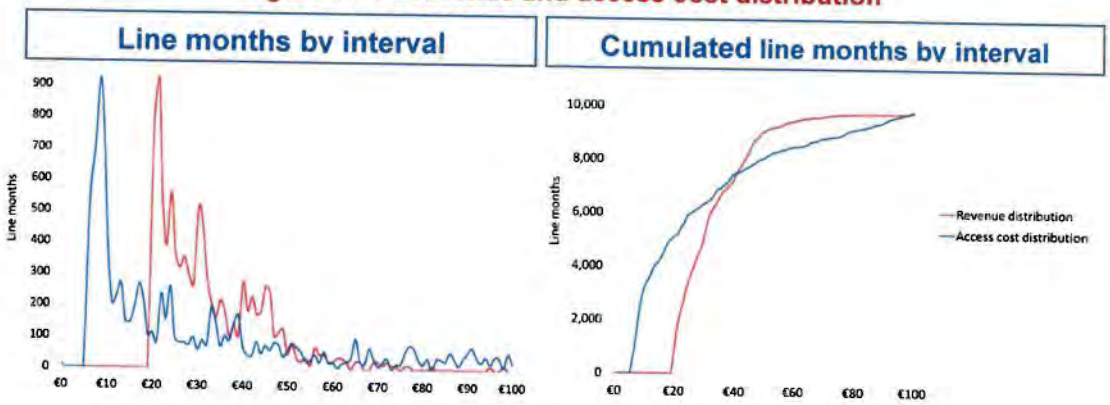
2.4.1 Customer Model

2.4.1.1 ✂

A high value of the net cost for the MDF ✂ is due mainly to a great number of lines. However, the net cost per one uneconomic line is also rather high.

The net cost of uneconomic customers in economic areas does not have exactly the same drivers as the net cost of uneconomic areas. It depends not only on the total value of the revenue but also on its distribution. For the same revenue value, the MDF that is more likely to have more uneconomic customers is the one with a greater dispersion.

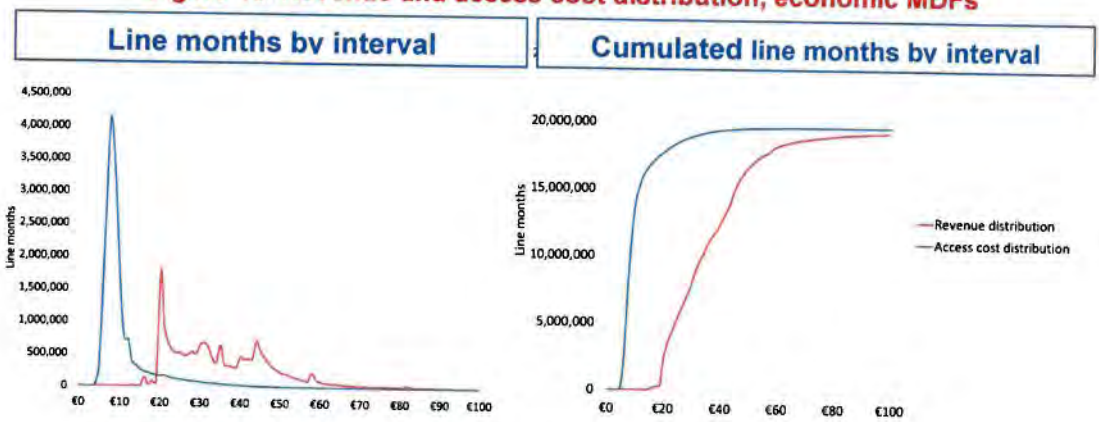
Figure 17. ✂ revenue and access cost distribution



Source: Customer Access Model, TERA Consultants analysis

This distribution is to be compared with the distribution of all the lines located in economic areas (figure below). For the MDF ✂ the number of lines with big net cost is relatively high (the right part of the figure above).

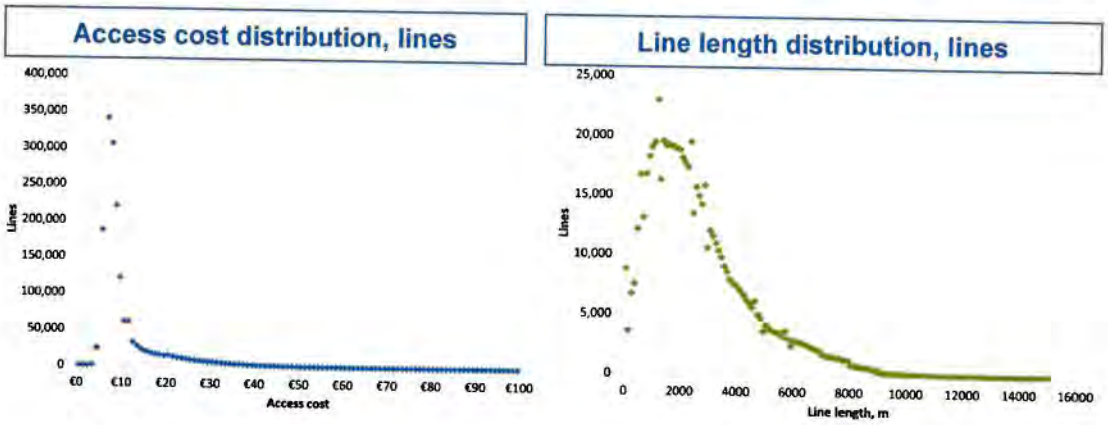
Figure 18. Revenue and access cost distribution, economic MDFs



Source: Customer Access Model, TERA Consultants analysis

In its turn, access cost depends on the line length.

Figure 19. Cost and line length distribution

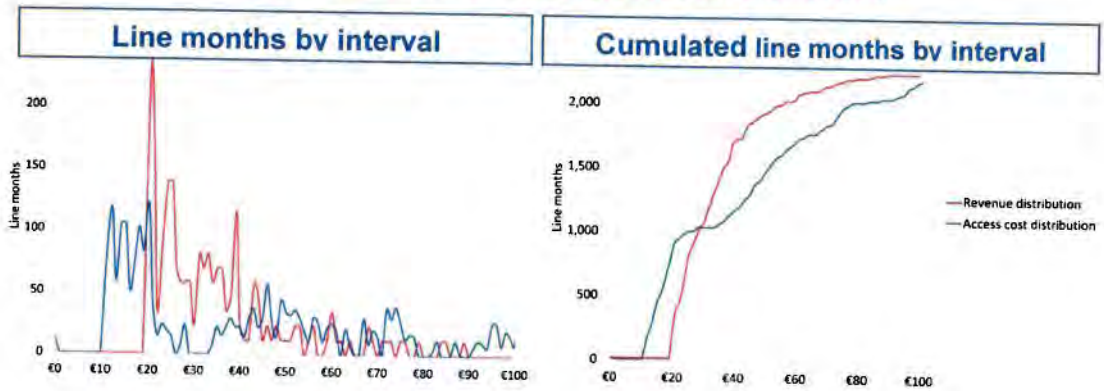


Source: Customer Access Model, TERA Consultants analysis

2.4.1.2 ✂

The access cost distribution profile for the MDF ✂ is different from a typical profile: it is closer to uniform distribution, with a great number of lines being situated in the more expensive left part of the graph. It generates a high average access cost: €✂/line compared to €✂/line on the average (see Table 11).

Figure 20. ✂ revenue and access cost distribution



Source: TERA Consultants

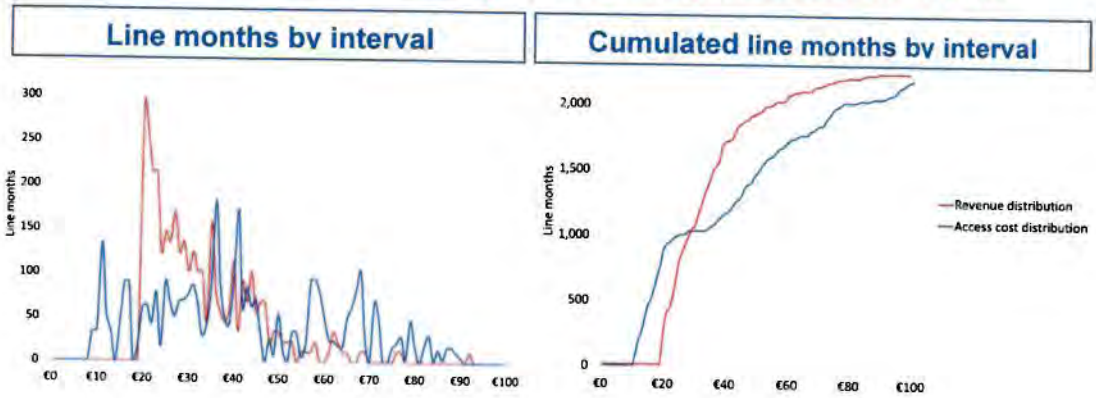
For the MDF ✂ the lines distribution by access cost is even more skewed to the right than for the MDF ✂. It explains a high number of uneconomic customers.

2.4.1.3 ✂

MDF ✂ has a particularly high number of uneconomic customers equal to ✂%.

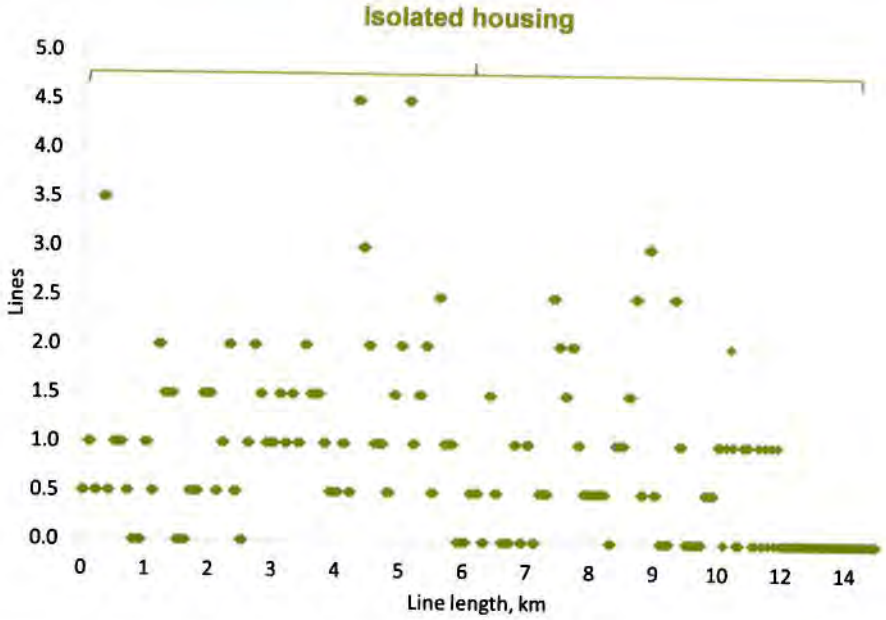
It is explained by two factors. First, the line length distribution is not typical: a significant number of lines are long and correspondingly more expensive. Additionally, there is no housing area corresponding to this MDF and all customers are located in isolated houses. Isolated houses have a higher proportion of avoidable costs.

Figure 21. Line distribution by revenue and by access cost for MDF ✂



Source: TERA Consultants

Figure 22. ✂ line length distribution



Source: Customer Access Model

Since the net cost of uneconomic customers depends crucially on the distribution of line length, it should be checked that this data is not skewed. eircom explains that the data is "Based on DB measurements for majority of lines, for areas with no measurements the ✂ is used". However, no details are given on:

- ✂ method;
- proportion of MDFs for which information was not available and their net costs.

Since it concerns only a minor part of areas and so does not have a significant impact on the results, no data requests have been made with respect to this issue.

The net cost crucially depends on the line length distribution that is why hypothesis on this distribution should be made with caution when data is not available.

2.5 Input inconsistencies detected

When analysing the input data, TERA Consultants has found the following inputs which were difficult to interpret and for which further clarifications were needed.

1. For the MDF ✂, the value of depreciation for the code ✂ - €✂- has a sign which is different from the sign for all the other MDFs. [15] It has an impact on the other sheets and consequently on the main model. eircom explains that this negative value relates to a number of vendor credits associated with the ✂exchange which were still being processed through the asset register in 2009/2010.[16] This MDF was excluded from the analysis.
2. At first glance, it was not clear why the revenue corresponding to DSL-R was negative.[17] eircom provides the explanation that the negative DSL revenue is related to one-off revenue from additions in 2009/10, i.e. it is revenue generated as part of providing DSL connections.

Input numbers that were difficult to interpret are explained by operational and accounting specificities and correctly used in the model.

2.6 Payphone Model

In the Payphone Model, several calculations seemed to be inconsistent with the methodological document. These inconsistencies did not entail any change in the final net cost of 2009/10 financial year. However, these points were clarified to ensure correct net cost calculation for future applications.

First, there was an inconsistency in the **identification procedure of uneconomic payphones in economic and uneconomic areas.**

TERA Consultants has made an alternative calculation with modification of the ✂as well as of the last columns of the ✂. The cell "No. of uneconomic payphones" calculates the total number of uneconomic payphones by taking all those payphones for which the ✂ indicates 0. The cell "No. of uneconomic payphones in economic areas" takes only those payphones that are situated in economic area, which requires that economic indicator of the line in the column ✂ gives 0 and economic indicator of the area in the column ✂ gives 1. The last value is less or equal to "No. of uneconomic payphones".

As a result, the number of uneconomic payphones in the ✂has changed: it became ✂ instead of ✂. Net cost per payphone became equal to €✂ and not to €✂.

[15] Source: ✂

[16] WIK-Consult. Response to ComReg on Certain Costing Issues Pertaining to the USO Net Cost Model. ✂

[17] Source: ✂

In 2009/2010 the number of uneconomic payphones coincides with the number of uneconomic payphones in economic areas ✂.

Table 13. ✂

✂

Source: ✂

eircom has amended the formula of calculating the number of uneconomic payphones accordingly.[18] It did not change the final net cost value.

Second, there were **two missing payphones**: for two USO payphones the net cost was not calculated.

The revenue received from payphone ✂ is reported equal to ✂[19]. It was not clear how it is possible since traffic volume was material and equal to ✂ minutes[20]. If the revenue was equal to zero, this payphone would have been uneconomic but it did not appear in the list of uneconomic payphones.

eircom explains that the reported ✂ revenue is a consequence of a fault in the reporting system. Contrary to the reporting, the payphone was active during the financial year in question. In the absence of reliable information on the revenue, it was decided not to include this payphone as uneconomic for the 2009-2010 estimation.

Cost of the payphone ✂ was equal to ✂, which was not realistic. First, even if a payphone is not used the maintenance costs are still incurred. Second, the corresponding revenue and traffic ✂, which means that there exist core costs of calls.

eircom explains that ✂ cost appeared because no MDF was assigned to this payphone. It has been updated by assigning to it MDF ✂. At the same time, eircom has found that the revenue was not updated with the latest available information in the excel file ✂. It has been updated as well.

[18] WIK Consult. Response to ComReg on certain costing issues pertaining to the USO net cost model. ✂

[19] Source: ✂

[20] Source: ✂

Third, **the revenue scope from advertisement and WIFI** was not initially clear. In the excel file, two types of revenue from advertisement and WIFI were indicated:

- €✂of advertising revenue according to reg. accounts as indicated in ✂,
- €✂of WIFI net revenue in ✂.

Table 14. ✂

✂

Source: ✂

At the same time, in ✂ revenue of €✂is indicated as WIFI net revenue and not advertising revenue.

Table 15. ✂

✂

Source: ✂

Consequently, it was not clear whether the revenue of €✂corresponded to WIFI or advertisement revenue.

eircom has made additional investigation of regulatory accounts to find an explanation. eircom has found that the advertisement revenue of €✂has included a revenue that was not in fact related to advertisement on payphones but to the income from ✂ (a third party company) for calls using credit cards. After exclusion of this cost and after correcting for regulatory-specific discount re-allocation process, it yields the advertisement revenue equal to €✂. For the WIFI revenue, the figure equal to €✂instead of €✂should be used.

The implementation of the proposed methodology to calculate the net cost of uneconomic payphones is correct.

3 Overlaps with intangible benefits calculation

The check with the intangible benefits model included two main exercises. First, it was checked that on the other hand intangible benefits were not double counted and on the other hand that they were taken into account either in the main model or in the intangible benefits model. Second, it was checked that the values inputs of the intangible benefits model that were sourced from the main model correspond indeed to the outputs of the main model.

3.1.1 Enhanced Brand Recognition

Method used to evaluate the enhanced brand recognition benefit does not create any double counting issues.

Initially the inputs used in the calculation of the enhanced brand recognition did not coincide with the main model results. It concerned the number of lines and the average cost per line. Clarifications were received from eircom concerning these issues.

When calculating the benefit from enhanced brand recognition, eircom initially used the following numbers: ✂fixed residential PSTN/ISDN subscribers living in economic areas and ✂– in uneconomic areas. The number of subscribers in the Area Model was not the same: number of PSTN/ISDN lines is ✂ in economic areas and ✂ in uneconomic areas.[21] eircom has checked these numbers and confirmed that the numbers in the intangible benefits report should be updated. The updated value is ✂ for fixed residential subscribers in economic areas and ✂ for fixed residential users in uneconomic areas.[22] The number of residential users is lower than the total number of users.

According to the report on intangible benefits, an avoidable cost per fixed line per year is €✂. TERA Consultants has used data from the Area Model to estimate the cost per PSTN/ISDN line in economic areas and found that it was equal to €✂. eircom has updated the model accordingly.

eircom has clarified the discrepancies in the number of lines in economic and uneconomic areas between the intangible benefits report and the main model.

3.1.2 Ubiquity

Method used to evaluate the ubiquity benefit does not create any double counting issues.

TERA Consultants has identified the inputs used in the calculation of the ubiquity benefit that did not initially coincide with the main model results. It concerned the number of lines and the average revenue per economic subscriber. These issues have been clarified by eircom.

[21] Source: ✂.

[22] ✂

When calculating the benefit from enhanced brand recognition, eircom initially used **the number of uneconomic phone lines** in 2009/10 equal to ✂and this data was sourced from the Area Model. It seems that in fact these ✂ correspond to the number of lines situated in uneconomic areas and not to the number of uneconomic lines situated in economic areas. Indeed, eircom states "The number of subscriber lines in uneconomic areas in the financial year 2009/10 was ✂."

This number depends on the scope of services. There are 9 types of services in the model: PSTN, DSL-Retail, SB-WLR, UMPL, Line Share, DSL-Bitstream, PP, Supplementary, and LL. When eircom calculates the final number of lines in uneconomic areas in the Area Model, it takes the sum of lines that correspond to the following services: PSTN, SB-WLR, UMPL, Suppl., LL. In this case the number is equal to ✂[23]. In another sheet of the Area Model, eircom takes only PSTN/ISDN lines; in this case the number is lower and equal to ✂[24]. In conclusion, neither of these numbers is equal to ✂ and further explanations are needed. eircom has confirmed that ✂ is indeed the number to use ✂.

The intangible benefits report identified a value of €✂for the average revenue per new subscriber. It did not exactly coincide with the values issued from the Area Model but it is very close. Indeed, from the Area Model, we find the number of lines in economic areas equal to ✂[25] (✂). The net benefit is equal to €✂[26] (✂). It gives the average cost per subscriber in economic area equal to €✂ (✂).

Intangible benefits report uses outputs of the Area Model to calculate the **eircom's market share** in economic areas and finds ✂%.

From the intangible benefits report it was not absolutely clear how the market share of eircom on the fixed telephony market in economic areas was calculated and which hypothesis were made.

As TERA Consultants has understood, eircom has divided the services into two groups: retail and wholesale. Further, the market share of eircom has been calculated as the relation between the number of lines corresponding to the retail services divided by the number of lines corresponding to retail plus wholesale services. TERA Consultants has estimated the market share of eircom using these principles and has concluded that the market share of eircom would be ✂% (✂% from the table below).

[23] Source: ✂

[24] Source: ✂

[25] Source: ✂ and TERA Consultants calculations.

[26] Source: ✂ and TERA Consultants calculations.

Table 16. Number of lines per service

Service	Category	Number of services in economic areas, lines	Number of services in economic areas, %
PSTN	Retail	✂	✂%
DSL-Retail	Retail	✂	✂%
SB (single bill)-WLR	Wholesale	✂	✂%
UMLP	Wholesale	✂	✂%
Line share	Wholesale	✂	✂%
Bitstream	Wholesale	✂	✂%
Total	-	✂	*100%*

Source: ✂

eircom ✂ has confirmed that eircom's market share in economic areas is to be updated. The market share in uneconomic areas is equal to ✂% in the updated model.

eircom has updated discrepancies between intangible benefits calculations and the area model, principally arising from the clarification process.

3.1.3 Life Cycle Benefits

Life cycle benefit consists of two components:

1) benefit from uneconomic areas becoming economic,
2) benefit from uneconomic customer model becoming economic.

eircom explains that in order to estimate the benefit related to uneconomic areas the model is run two times: with the life-cycle mark-up benefit parameter equal to ✂% and to ✂%. In the area model the life cycle benefit is equal to ✂ since the mark-up does not change the number of uneconomic areas. TERA Consultants has checked this result. ✂.

Table 17. ✂

↑ Global parameters			
Modelling / financial year		2009 - 2010	
Currency unit		EUR	
Cost of capital	Excel Name: CoC	10.21%	Based on Comreg Decision No.D01/08, "eircom's Cost of Capital", 22 May 2008
Days in a year		365.00	
Days in a month		30.42	
Life-cycle benefit factor		✂	Source: WIK report

Source ✂

TERA Consultants has checked how the result of the model changes if this parameter is set to ✂%. It reduces the net cost by €✂and no uneconomic MDFs become economic, which means that the corresponding benefit is still equal to ✂.

Calculation of the life cycle benefit from customers is not explicitly given in the Customer Model. According to the report, the life cycle benefit is taken into account in the Customer Model and "additional revenue of €✂ has been reflected in the Customer Model." In the customer model, the life cycle benefit is estimated as the difference between net cost with and without mark-up. Customer model calculation relies on a net revenue table by MDF and net revenue bands. Since they can only be created on the data warehouse, it would not be practical to make this data available through conventional data base tools, and these calculations were not provided.

Following the change in the value of the mark-up parameter from ✂% to ✂%, the value of life cycle benefit has evaluated from €✂ to €✂. The value of the benefit from uneconomic areas still remains at ✂. The change in the benefit must be due to the change in the customers' benefit which cannot be calculated by TERA Consultants because of the lack of data.

TERA Consultants agree with the principles and methodology underpinning the calculation of life-cycle benefits provided by eircom. However validation of the calculations could not be undertaken as the calculation in the customer model relies on a net revenue table by MDF and net revenue bands. TERA Consultant were informed it would not be practical to make this supporting data available, as it is created in the eircom data warehouse and is not available in conventional data format. TERA Consultants recommend that this information is made available in conventional format for future assessments, for thorough verification to be undertaken.

3.1.4 Marketing Benefits

Two categories of marketing benefits are discussed:

- Use of customer data – benefit from using data on uneconomic areas and uneconomic customers in economic areas;
- Advertising benefit – benefit due to corporate branding or logo display.

Regarding the use of customer data, this benefit is not included in the calculation of net costs of uneconomic areas and uneconomic customers. However, this benefit is

implicitly accounted for in the Directory Enquiry Service and Directories Model: when calculating net cost of printed directories, the value of a database is taken into account. By not considering the value of the database in the costs of printed directory their costs are kept lower than they would otherwise have been.

Regarding advertising revenue from payphones, there were differences in several inputs values between the intangible benefits report and the main model.

First, there was a divergence in the number of payphones.

Table 18. ✂

✂

Source: ✂

eircom has confirmed that these differences were a result of adjustments to the model. The updated number of payphones is 2,266 and the updated number of USO payphones is 1,397.

The intangible benefits report did not seem to distinguish between USO payphones (those located on the street and in other public areas available to the public at all times) and uneconomic payphones. When calculating intangible benefits, the relevant number is the number of uneconomic PP equal to ✂.

Percentage of payphones with positive advertisement effect was not the same in the model and in the intangible benefits document:

- only ✂% of payphones had a positive advertisement effect according to the intangible benefits report;
- eircom has determined the list of PP where advertisement is likely. According to this list, ✂% of all the payphones, ✂% of USO payphones and for ✂% of uneconomic payphones were likely to have advertising according to the Payphone Model[27].

It was not clear why the proportion in the PP model was significantly higher than the one used in the intangible benefits report.

[27] ✂

Since only uneconomic PP should be considered when calculating intangible benefits, the relevant number would be the proportion of PP with positive advertisement effect among uneconomic PP.

Intangible benefit from one PP was estimated at €✂ before adjustments. There was not enough explanation on how this estimation was made and whether it was in line with calculations made in the PP model. In the PP model, the average advertisement revenue per PP per year was equal to €✂. It was estimated by dividing the total advertising revenue €✂ by the total number of payphones with positive advertising effect ✂.

Following the remarks of TERA Consultants, eircom modified the approach to marketing benefits calculations and to directly incorporate it into payphone model. In the intangible benefits report eircom gives two sources of revenue: "Uneconomic payphones and uneconomic WiFi hotspots could create an intangible benefit to eircom due to corporate branding or logo display. Additionally some locations may be used for advertisements by other companies, which could generate income for eircom." In other words, marketing benefits related to payphones include two revenue sources:

- Direct revenue from advertisement of third parties' products which is reflected in the accounts.
- Indirect (hypothetical) revenue from advertisement of eircom's image by putting the eircom's logo on the phone boxes that is not reflected in the accounts. For example, it is taken into account when estimating intangible benefits in Belgium, UK and Italy.

As a result of adjustments to the payphone model both the first type of the revenue[28] and the second one[29] are taken into account and there is no evidence of double-counting.

Following the remarks of TERA Consultants, eircom has updated calculation of both the net cost of payphones and the marketing benefit. Calculations adhere to the proposed methodology.

[28] ✂

[29] ✂