Forward looking review of future AFL element of USO in Ireland

REPORT – Non Confidential

ComReg

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Table of contents

1 Introduction

Universal Service Obligations (USOs) aim to ensure the provision of the right of end-users to benefit from basic electronic communications services that would potentially not be delivered by the market to all in normal conditions absent regulation (e.g. in rural or sparsely populated areas and/or less economic customers). Along with other basic services (Directory, Public call boxes, etc.), ComReg is required to ensure that end-users have the ability to connect to a public communications network at a fixed location (Access at Fixed Location or AFL) and are able to make use of basic telephony services (voice, facsimile and functional internet).

The current AFL USOs imposed by ComReg are in force until 31 of December 2015. Prior to the expiry of current AFL designation, ComReg entered in a forward looking review of the future of the AFL element of the USO process. ComReg is responsible for reviewing these obligations on a regular basis. It has committed to undertaking a review of the future requirement of AFL USO in its consultation 14/48 and in its most recent AFL Decision, D10/14.

The design of future AFL USOs needs to take into account current market trends and likely evolutions in the coming 5 years. These include the intensification of competition from UPC, the deployment of FTTH networks by Vodafone (joint venture with ESB) and by Eircom, the development of the National Broadband Plan (NBP) and selection of a company to deploy and operate the funded network, the adoption of VoIP, further development of mobile networks, regulation of Wholesale Line Rental, etc.

ComReg needs to assess the continued need, if any, for an AFL USO and its associated components of Quality of Service (QoS), Geographically Averaged Prices (GAP), Reasonable Access Threshold (RAT) and Functional Internet Access (FIA) in the next 5 years in the whole, or in certain geographic areas, of Ireland.

The aim of this report is to provide TERA Consultants' expert views on the need for an AFL USO in the years to come in the whole, or in certain geographic areas, of Ireland.

- Description of the AFL USO context in Ireland (see §2);
- Study of the latest fixed access services market evolutions (see §3);
- Assessment of the likely consequences if AFL USOs are ceased (See §4);
- Recommendations on future AFL USOs (see §5).

In annexes, a benchmark of AFL USOs imposed by other NRAs in Europe is provided to compare Ireland with the rest of Europe with respect to AFL USO (see §7). Also, a summary of industry responses to ComReg's consultation 14/48 on the provision of AFL under USO in the Irish market (see §8).

2 Context of the USO in Ireland

Universal Service Obligations (USOs) likely to be imposed in Member States have been defined by the European Commission from 2002 in the "Universal Service Directive" (see §2.1). This European regulatory framework has then been adapted into Irish law by the "Universal Service Regulations"[1]. Pursuant to the Universal Service Regulations, primary responsibility for safeguarding the provision of the universal services, including AFL, lies with ComReg[2] (see §2.2).

The scope of USO being subject to changes over time, a preliminary public consultation has been organised by ComReg and has enabled to collect market players initial views on required AFL USOs in Ireland (see §2.3).

These elements of context are analysed in this section.

2.1 European Commission Universal Service Directive

2.1.1 Obligations regarding AFL

The set of obligations to be included by Member States as part of the Universal Service is defined at the European level by Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive) as amended by Directive 2009/136/EC.

As regards AFL, obligations provided for by the Directive (some are mandatory, others are more optional depending on national circumstances) can be summarized as follows:

Table 1 - Universal Service Directive obligations related to the access at a fixed location

AFL related USOs	Mandatory or optional?
All reasonable requests for connection at a fixed location to a public communications network must be met (Article 4-1)	Mandatory
AFL must be capable of supporting voice (originating and receiving national and international calls), facsimile and a Functional Internet Access (FIA)[3] (Article 4-2 and Article 4-3)	Mandatory

[1] European Communities (Electronic Communications Networks and Services) (Universal Service and Users' Rights) Regulations 2011 (S.I. No. 337 of 2011).

[2] ComReg must obtain the consent of Minister for Communications, Energy and Natural Resources (the "Minister") in connection with the exercise of certain of its powers under the Universal Service Regulations.

[3] Wireless technologies should be allowed to provide AFL USO.

Member states may impose measures to ensure AFL prices are affordable (Article 9)	Optional
Member states may impose geographically averaged prices (Article 9)	Optional
Terms and conditions must be established in such a way that the subscriber is not obliged to pay for unnecessary facilities or services. Expenditure control shall be ensured and unwarranted disconnection of service avoided (Article 10)	Mandatory
NRAs shall be able to set performance targets (Article 11)	Optional

Source: TERA Consultants analysis of the Universal Service Directive

All reasonable requests for connection at a fixed location to a public communications network must be met

The Directive provides that reasonable connection requests to a public communications network shall be met:

> *"Member States shall ensure that all reasonable requests for connection at a fixed location to a public communications network are met by at least one undertaking."*[4]

The concept of "reasonable request" is not further detailed by the Directive. It is up to Member State to specify it in the specific context of each national circumstance.

AFL must be capable of supporting voice (originating and receiving national and international call), facsimile and a Functional Internet Access

The access at a fixed location provided shall be able to support a minimum set of services including voice, facsimile and a Functional Internet Access (FIA):

> *"The connection provided shall be capable of supporting voice, facsimile and data communications at data rates that are sufficient to permit functional Internet access, taking into account prevailing technologies used by the majority of subscribers and technological feasibility."*[5]

Voice services that shall be provided thanks to the AFL include both outgoing and incoming national and international calls:

> *"Member States shall ensure that all reasonable requests for the provision of a publicly available telephone service over the network connection referred to in*

[4] Article 4, §1

[5] Article 4, §2

> *paragraph 1 that allows for originating and receiving national and international calls are met by at least one undertaking."*[6]

No minimum speed for FIA is specified in the Directive. It is up to each Member State to specify it in the specific context of national circumstances.

The Directive underlines that Member States should not set excessive technical constraints on the service provision and should in particular allow the use of wireless technologies to provide AFL:

> *"There should be no constraints on the technical means by which the connection is provided, allowing for wired or wireless technologies, nor any constraints on which operators provide part or all of universal service obligations."*[7]

Of course, this is to the extent that wireless technologies can support voice, facsimile and FIA.

A recent judgment by the European Court of Justice (ECJ) in 11 June 2015, underlines that the provision of mobile communication services and/or Internet services are excluded from the minimum set of universal services defined in the Universal Service Directive. While the ECJ stated that "*the term 'at a fixed location' means the opposite of mobile",* it is important to note that the judgment considered what constitutes a universal service, rather than what technology is capable of providing a universal service.

AFL prices should be affordable

Article 9 underlines that Member States may require AFL to be available at an affordable price, potentially lower to the price that would be provided under normal market conditions:

> *"Member States may, in the light of national conditions, require that designated undertakings provide to consumers tariff options or packages which depart from those provided under normal commercial conditions, in particular to ensure that those on low incomes or with special social needs are not prevented from accessing the network referred to in Article 4(1) or from using the services identified in Article 4(3) and Articles 5, 6 and 7 as falling under the universal service obligations and provided by designated undertakings."*[8]

[6] Article 4, §3

[7] Paragraph (8)

[8] Article 9, §2

In particular, Member States may decide, depending on local market conditions, that low income users should benefit from social tariffs or may decide to impose a price cap:

> *"Member States may, besides any provision for designated undertakings to provide special tariff options or to comply with price caps or geographical averaging or other similar schemes, ensure that support is provided to consumers identified as having low incomes or special social needs"*[9]

Member States can impose geographically averaged prices

Based on local market conditions, Member States may choose to impose geographically averaged prices for the access at a fixed location:

> *"Member States may require undertakings with obligations under Articles 4, 5, 6 and 7 to apply common tariffs, including geographical averaging, throughout the territory, in the light of national conditions or to comply with price caps"*[10]

This pricing mechanism creates in principle the potential for cross-subsidies from low network roll-out cost areas to high network roll-out cost areas. This mechanism may be relevant when network roll-out costs are particularly different across a given country.

Terms and conditions shall be established in such a way that the subscriber is not obliged to pay for unnecessary facilities or services. Expenditure control shall be ensured and unwarranted disconnection of service avoided

A mechanism ensuring that end-users are able to monitor and control expenditures must be in place.

Article 10 – Control of expenditures

> *"Member States shall ensure that designated undertakings, in providing facilities and services additional to those referred to in Articles 4, 5, 6, 7 and 9(2), establish terms and conditions in such a way that the subscriber is not obliged to pay for facilities or services which are not necessary or not required for the service requested.*
>
> *Member States shall ensure that designated undertakings with obligations under Articles 4, 5, 6, 7 and 9(2) provide the specific facilities and services set out in Annex I, Part A, in order that subscribers can monitor and control expenditure and avoid unwarranted disconnection of service."*[11]

The specific facilities and services at stake are:

[9] Article 9, §3

[10] Article 9, §4

[11] Article 10, §1-2

"Part A: Facilities and services referred to in Article 10

(a) Itemised billing

Member States are to ensure that national regulatory authorities, subject to the requirements of relevant legislation on the protection of personal data and privacy, may lay down the basic level of itemised bills which are to be provided by designated undertakings (as established in Article 8) to consumers free of charge in order that they can:

(i) allow verification and control of the charges incurred in using the public telephone network at a fixed location and/or related publicly available telephone services, and

(ii) adequately monitor their usage and expenditure and thereby exercise a reasonable degree of control over their bills.

Where appropriate, additional levels of detail may be offered to subscribers at reasonable tariffs or at no charge.

Calls which are free of charge to the calling subscriber, including calls to helplines, are not to be identified in the calling subscriber's itemised bill.

(b) Selective call barring for outgoing calls, free of charge

I.e. the facility whereby the subscriber can, on request to the telephone service provider, bar outgoing calls of defined types or to defined types of numbers free of charge.

(c) Pre-payment systems

Member States are to ensure that national regulatory authorities may require designated undertakings to provide means for consumers to pay for access to the public telephone network and use of publicly available telephone services on pre-paid terms.

(d) Phased payment of connection fees

Member States are to ensure that national regulatory authorities may require designated undertakings to allow consumers to pay for connection to the public telephone network on the basis of payments phased over time.

(e) Non-payment of bills

Member States are to authorise specified measures, which are to be proportionate, non-discriminatory and published, to cover non-payment of telephone bills for use of the public telephone network at fixed locations. These measures are to ensure that due warning of any consequent service interruption or disconnection is given to the subscriber beforehand. Except in cases of fraud, persistent late payment or non-payment, these measures are to ensure, as far as is technically feasible, that any service interruption is confined to the service concerned. Disconnection for non-payment of bills should take place

only after due warning is given to the subscriber. Member States may allow a period of limited service prior to complete disconnection, during which only calls that do not incur a charge to the subscriber (e.g. "112" calls) are permitted."[12]

NRAs shall be able to set performance targets

NRAs shall ensure that information concerning USP QoS performance is published:

> *"National regulatory authorities shall ensure that all designated undertakings with obligations under Articles 4, 5, 6, 7 and 9(2) publish adequate and up-to-date information concerning their performance in the provision of universal service, based on the quality of service parameters, definitions and measurement methods set out in Annex III. The published information shall also be supplied to the national regulatory authority.*
>
> *National regulatory authorities may specify, inter alia, additional quality of service standards, where relevant parameters have been developed, to assess the performance of undertakings in the provision of services to disabled end-users and disabled consumers. National regulatory authorities shall ensure that information concerning the performance of undertakings in relation to these parameters is also published and made available to the national regulatory authority."*[13]

In order to ensure a satisfying level of QoS, a NRA may publish performance indicators, set performance targets and monitor the consistency of performance of indicators with these performance targets:

> *"National regulatory authorities may, in addition, specify the content, form and manner of information to be published, in order to ensure that end-users and consumers have access to comprehensive, comparable and user-friendly information.*
>
> *National regulatory authorities shall be able to set performance targets for undertakings with universal service obligations. In so doing, national regulatory authorities shall take account of views of interested parties, in particular as referred to in Article 33.*
>
> *Member States shall ensure that national regulatory authorities are able to monitor compliance with these performance targets by designated undertakings."*[14]

Enforcement mechanisms may be designed in case of persistent failure to meet performance targets:

[12] Annex I, Part A

[13] Article 11, §1-2

[14] Article 11, §3-4-5

"Persistent failure by an undertaking to meet performance targets may result in specific measures being taken in accordance with Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive) (1). National regulatory authorities shall be able to order independent audits or similar reviews of the performance data, paid for by the undertaking concerned, in order to ensure the accuracy and comparability of the data made available by undertakings with universal service obligations." [15]

2.1.2 Obligations review

The European Commission is legally obliged to periodically review the scope of universal service. The last review in November 2011 concluded that there was no need to change the basic principles or scope of the rules or to include mobile electronic communications services or broadband connections at the European Union level. The European Commission launched preparatory work in 2014: on the 3rd of March 2014, DG CONNECT prepared a questionnaire aimed at providing the Commission with detailed information on the implementation of the universal service rules in the European Union and requested to BEREC gathering this information from its Members. The report was approved on the 2nd of July 2014. No further information is available at this stage on the process.

2.2 ComReg's imposition of AFL USO

ComReg is responsible for the regulation of the electronic communications sector in Ireland. As parts of its assignments, ComReg has to determine the need for and scope of the USO for the Irish market and to decide which undertaking(s) should as relevant be designated as USP(s).

2.2.1 Scope of the Irish AFL USO

The current scope of USO for the provision of AFL in Ireland consists of:

All reasonable requests for connection at a fixed location to a public communications network must be met

[15] Article 11, §6

ComReg in Decision D09/05[16] has specified what it considers a reasonable request: the USP must treat all requests as reasonable if the expenditure involved is lower than €7,000 or greater than €7,000 but the applicant agrees to pay the standard connection plus charges above €7,000:

> *"The USP will be required to consider all requests for connections as reasonable if the expenditure involved in meeting the request is less than €7,000 and the cost to the applicant shall not exceed the standard connection charge. Requests for connections which involve expenditure in excess of €7,000 are to be considered reasonable if applicant agrees to pay standard connection charge plus incremental costs above €7,000"*

AFL must be capable of supporting voice (originating and receiving national and international call), facsimile and a Functional Internet Access

In accordance with the Universal Service Directive (transposed into Irish law by the Universal Service Regulations), the USP in Ireland is obliged to provide AFL capable of allowing end-users to make and receive local, national and international telephone calls, facsimile communications and data communications, at data rates that are sufficient to permit FIA.

The minimum data rate enabling FIA has been set in 2005 to 28.8 kbps for 94% of installed telephone lines:

> *"The Universal Service Provider shall have regard to the overall targets for total installed telephone lines capable of a reasonable minimum data rate of 28.8kbit/s or better as follows:*
>
> *- 31 December 2005 – 93.5%*
>
> *- 30 June 2006 – 94%"*[17]

AFL prices should be affordable

With respect to affordability, a retail price control (a requirement not to charge excessive prices and a price cap mechanism) is imposed on retail line rental.[18] The retail price cap relates to consumer's standalone fixed voice access services (notably PSTN and ISDN BRA line rental and connection fees, excluding voice calls) and does not allow Eircom to increase this line rental price more than the rate of inflation (i.e. CPI-0). However, this obligation is the result of a market definition and finding of significant market power (SMP) on the market for retail fixed voice access ('RFVA

[16] ComReg D09/05 (http://www.comreg.ie/_fileupload/publications/ComReg0570.pdf)

[17] ComReg D09/05 (http://www.comreg.ie/_fileupload/publications/ComReg0570.pdf)

[18] Pursuant to ComReg Decision D12/14 on the retail fixed voice access market ('RFVA Decision') – http://www.comreg.ie/_fileupload/publications/ComReg1489.pdf

markets') and is currently separate but complementary to the Universal Service Obligations. If ComReg were to decide for example that Eircom no longer continues to have SMP in RFVA markets and absent any price cap obligation as part of the USO, possibly Eircom would have the ability and incentive to increase its retail line rental price to the detriment of consumer welfare.

In December 2012, the Government ('Department of Social Protection', 'DSP') announced that from January 2013 the telephone allowance would be reduced from €22.58 to €9.50. In 2014, the Government withdrew altogether the telephone allowance. It is to be noted that the USP offers low usage voice packages (see §3.1.2).

AFL prices should be geographically averaged

ComReg has imposed that the USP offers geographically averaged prices for AFL:

> *"In accordance with Regulation 8(3) of the Regulations, Eircom, as the USP shall apply geographically averaged prices throughout the State for the services referred to in this Decision."*[19]

Terms and conditions shall be established in such a way that the subscriber is not obliged to pay for unnecessary facilities or services. Expenditure control shall be ensured and unwarranted disconnection of service avoided

As provided for by Regulation 9 of the Regulations, the USP is being imposed the following:

> *"- Provide selective call barring facilities for outgoing calls to national, mobile, international and premium rate numbers. The call barring facility in respect of premium rate numbers shall be provided free of charge to users.*
>
> *- Maintain and publish its scheme to allow for the phased payment of connection fees.*
>
> *- Maintain and publish its disconnection policy in connection with non-payment of bills."*[20]

It is to be noted that a preliminary consultation on call barring was issued by ComReg earlier this year[21]. ComReg is consulting as to whether regulatory intervention would be appropriate to ensure that any necessary facilities are made available to all consumers and not only customers of the USP. Currently Eircom as USP is required to provide this service, while others voluntarily offer some call-barring facilities.

[19] ComReg D10/14 (http://www.comreg.ie/_fileupload/publications/ComReg1471.pdf)

[20] ComReg 12/71 (http://www.comreg.ie/_fileupload/publications/ComReg_1271.pdf)

[21] http://www.comreg.ie/_fileupload/publications/ComReg1531.pdf

Terms and conditions of the USP shall be established in such a way that the subscriber is not obliged to pay for unnecessary facilities or services.

The provision of itemised bills is not imposed under the USO any longer but by means of the General Authorisation. Not only the USP but all service providers in Ireland have obligations regarding the provision of itemised bills:

> *"An Authorised Person providing Authorised Services to a Consumer on a post-paid basis, must, provide each Consumer with fully itemised bill or non-itemised bill, as requested by the Consumer, if such a request is made."*[22]

Quality of Service performance targets

Obligations in respect of QoS performance targets are set out in ComReg D02/08. A USO Quality of Service Performance Improvement Programme for 2014 - 2015 PIP3[23] has been established. This programme also sets the penalties for not meeting the PIP targets.

ComReg set PIP targets for the USP to meet in terms of meeting requests for installation time (see annex, §9).

For not complying with the "Fault repairs completed within 2 working days" PIP target, the potential penalty on Eircom is capped to €2,500,000 for the annual period 1 January 2015 - 31 December 2015 (see annex for more details §9).

The target fault rate occurrence has been set to 14.5% for PIP3. The Financial Penalty for which Eircom may be liable, as a result of failure to meet its PIP Targets is capped at a maximum of €10,000,000 for the period 1 January 2015 - 31 December 2015:

Table 2 – Penalties for non-compliance with Fault Repairs occurrence PIP target (1 January 2015 – 31 December 2015)

Annual Performance Improvement Programme (PIP) Target	Annual Financial Penalty
14.5 faults per 100 lines	€1,000,000 per 0.1 above the target

Source: ComReg 14/129 (http://www.comreg.ie/_fileupload/publications/ComReg14129.pdf)

2.2.2 AFL Universal Service Provider

Eircom is currently designated as the USP for the purposes of providing AFL USO for an 18 month period from July 2014 until 31 December 2015.

[22] ComReg 13/52, Condition 18.7.2 (http://www.comreg.ie/_fileupload/publications/ComReg1352.pdf)

[23] ComReg 14/129 (http://www.comreg.ie/_fileupload/publications/ComReg14129.pdf)

2.3 ComReg Supplementary Consultation

In May 2014, ComReg undertook a consultation on the provision of AFL under USO in the Irish market (Ref: 14/48). Operators were called to express their views on, among other things, the proposed maintenance of a USO for the provision of AFL for a period of three to five years after the designation period commencing on 1 July 2014.

Six operators (ALTO, BT, Eircom, Magnet, UPC and Telefonica) and Údarás na Gaeltachta (the regional authority in charge of the economic, social and cultural development of the Gaeltacht areas), have responded to the consultation.

Among the respondents, Telefonica and BT agreed with ComReg's view for the need to designate a USP in charge of providing AFL service in Ireland from 1 July 2014 for a period of twelve or eighteen months (ComReg subsequently determined that the designation would remain in place until 31 December 2015), but have pointed out the necessity to undertake a deep analysis of the current Irish market landscape prior to any subsequent designation and express firmly their view that the current AFL USO scope and definitions need to be reviewed.

Table 3 summarizes the different views expressed by the other respondents (ALTO, Eircom, Magnet, UPC, Údarás na Gaeltachta) with respect to AFL USOs:

Table 3 – Summary of ComReg's AFL USO consultation outcome.

<table>
<tr><th>With respect to:</th><th>ALTO</th><th>Eircom</th><th>Magnet</th><th>UPC</th><th>Udaras na Gaeltachta</th></tr>
<tr><td>RAT</td><td>To be reviewed</td><td>To be decreased to ensure potential return on investment over 20 years</td><td>To be reviewed</td><td>To be maintained even if mobile is included</td><td>No comment</td></tr>
<tr><td rowspan="2">FIA</td><td>Including broadband (up to 2 Mbps)</td><td>To be reviewed in the light of NBP</td><td>Including broadband (up to 2 Mbps)</td><td>To be maintained (no need for broadband inclusion because of NBP)</td><td>Including broadband (up to 10 Mbps)</td></tr>
<tr><td colspan="5">All respondents agree with enabling USO through wireless technologies.</td></tr>
</table>

Affordability	All respondents agree with affordability measures for vulnerable customers				
GAP	To be maintained	To be reviewed given the emergence of differential competition across Ireland	To be maintained	To be maintained to ensure prices are affordable whatever the geographic location	To be maintained
Control of expenditures	To be maintained	A mandatory direct debit policy should be included	To be maintained	To be maintained	To be maintained
QoS	To be tightened (99% faults repaired within 5 days)	To be reviewed	To be tightened (99% faults repaired within 5 days)	To be tightened (can be achieved with mobile technologies as well)	No comment

Source: ComReg, The provision of telephony services under the universal service obligation- Access at Fixed Location. Submissions to consultation 14/18, Eircom's responses to ComReg S13D request of the 30th October (2014)

Operators have expressed different views on the future of AFL USO (especially Eircom versus other operators) but all agree on the ability to use wireless networks to provide service connection upon reasonable request.

Detailed respondents' answers to AFL USOs public consultation is provided in §7 (annex C).

2.4 Context summary

- The Universal Service Directive guarantees the right of end users to have access to the public communications network and to services, such as, voice and FIA. Essentially it sets the scope of universal service i.e. imposes a minimum set of universal services. Whereas the local implementation and the imposition of associated obligations are more discretionary and to be decided

by each Member State based on the national circumstances of each Member State. This is summarized hereafter :

Table 4 – Summary of the AFL USO components of the Universal Service Directive and 'Member States' power to define these components

With respect to:	*What is imposed…*	*What Member States can do…*
RAT	• Ensure that all reasonable requests for connection at a fixed location to a public communications network are met.	• Define a "reasonable request"
FIA	• Ensure AFL is capable of supporting voice (originating and receiving national and international calls), facsimile and a FIA	• Define what a "functional internet access" is (e.g. speed floor)
Affordability		• Oblige the USP to provide consumers tariff options or packages which depart from those provided under normal commercial conditions. • Set an AFL price cap
GAP		• Impose geographically averaged AFL prices
Control of expenditure	• Ensure consumers do not have to pay for facilities or services which are not necessary or not required for the service requested • Ensure subscribers can monitor and control expenditure and avoid unwarranted disconnection of service	• Define these concepts at the Member State level
QoS	• Ensure USPs publish adequate and up-to-date information concerning their performance in the provision of universal service and supply it to the NRA	• Specify the content, form and manner of QoS information to be published • Define performance targets

Source: TERA Consultants analysis of the Universal Service Directive

3 Latest AFL services market evolutions

The Irish electronic communications market has experienced changes over the last few years. Therefore, in order to assess the continuing need if any for AFL USOs, a review of recent and future market trends is necessary.

On the demand side, the following trends are observed and described in §3.1:

- Decreasing fixed voice traffic (§3.1.1.1) but steadily increasing Fixed Voice Access (FVA) subscriptions supported by bundled offers (§3.1.1.2);
- Increased use of VoIP services (§3.1.1.3);
- Certain sensitivity to AFL prices for some end-user categories depending on their valuation of services (§3.1.2);
- Declining number of narrowband Internet access customers but with limited options to move to broadband (§3.1.3).

On the supply side, alternative infrastructures and technologies supporting voice and Internet have developed. These are presented in §3.2:

- Current AFL USOs provided through Copper, FCS and Rurtel solutions (§3.2.1);
- Growing deployment of NGA solutions by the market (Eircom, UPC, Vodafone/ESB) (§3.2.2.1);
- Remote, rural or less dense populated areas may be covered in the future by a high capacity (NGA) network through a public intervention (National Broadband Plan) (§3.2.2.2);
- Several wireless technologies are available, some of them (such as 3G) already have a wide coverage, growing deployment of 4G and/or advanced LTE is envisaged (§3.2.2.3).

3.1 Consumer trends (demand side)

ComReg has recently performed a review of the retail Fixed Voice Access Market (RFVA Decision)[24] and of the associated Wholesale Fixed Voice Call Origination and Transit Markets[25]. These market analyses, which in TERA Consultants' view remain valid, are very relevant in the context of AFL USO and consequently they have been fully considered by TERA Consultants. However, these market analyses are generally broader than the scope of the review of AFL USOs.

As a consequence, the aim of this section is not to perform again an in depth analysis of these markets but rather to focus on market evolutions being directly relevant for AFL USOs.

[24] ComReg 14/89

[25] ComReg 15/82

3.1.1 Demand for AFL voice services

3.1.1.1 Fixed voice traffic

Despite the strong development of new communications means (Facebook, Twitter, etc.), voice remains a key communication service for end-users[26]. In Ireland, the total number of voice minutes (originating from fixed or originating from mobile excluding unmanaged VoIP) has remained high and relatively stable at around 5 hours per inhabitants in Ireland between 2009 and 2015[27]. Every month nearly 1.5 billons of minutes are originated from fixed and mobile networks in Ireland (see Figure 1). While the number of minutes slightly decreased by 2% per annum between 2009 and 2012, since then it has been slightly increasing (+1% per annum observed during the last quarters[28]). Also, nearly all households (98%, same as in the whole of European Union[29]) have telephone (mobile or fixed) access in Ireland.

Among this volume of voice minutes, mobile traffic is getting an always greater share of the total traffic. However, minutes originating from fixed networks still account for a significant share of the total traffic: 25% (see Figure 1). Fixed voice traffic was representing 45% of the total voice traffic in 2009 and if recent trends keep going, this share should represent 15% of the total traffic within 5 years, still an unneglectable share of the total traffic.

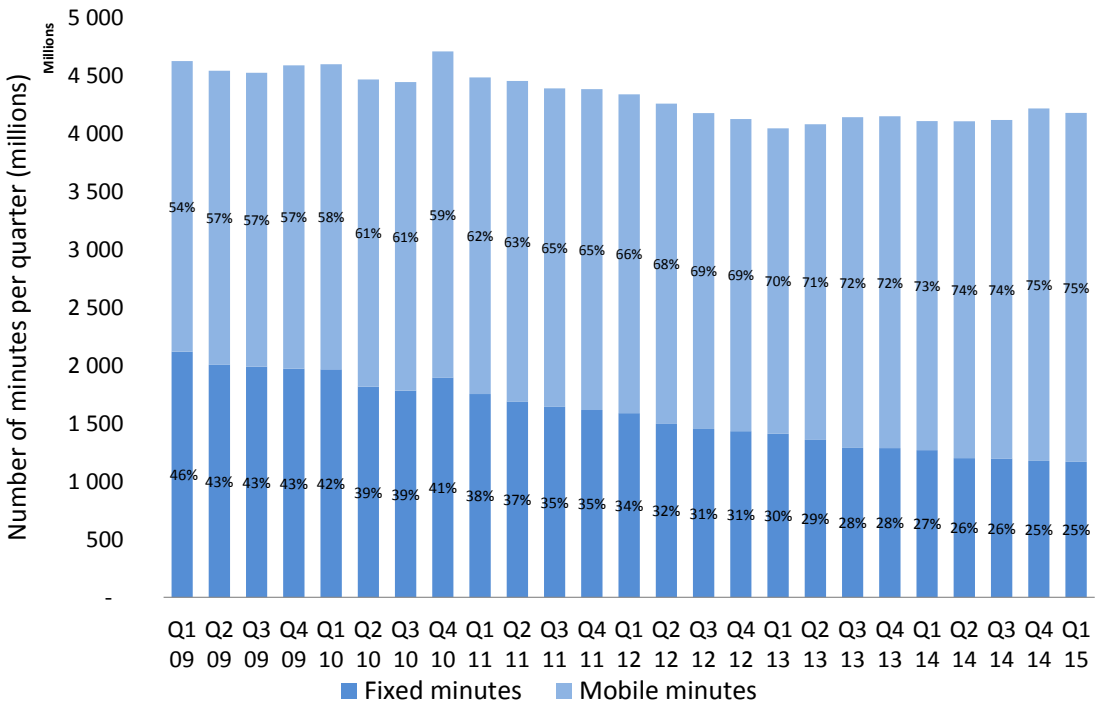
[26] It is noted that companies like Facebook, Google or Apple have developed their own voice service : http://techcrunch.com/2015/05/21/how-microsoft-took-the-lead-in-social-3-0-and-what-facebook-and-google-are-doing-about-it/#.wnxi7f:RqGW

[27] Source: ComReg quarterly report, TERA analysis, assuming 4.5 millions inhabitants

[28] After having removed seasonal effects

[29] Source: https://ec.europa.eu/digital-agenda/en/news/special-eurobarometer-414-e-communications-household-survey

Figure 1 – Voice minutes originated from fixed and from mobile networks in Ireland per quarter



Source: ComReg, Quarterly reports

The volume of fixed voice calls per residential subscriber has steadily decreased over the last number of years (see Figure 2). Over the last 12 months (between Q1'14 and Q1'15), the number of minutes originated from a fixed network has decreased by 13% (i.e. 23 minutes per residential customer). Over the 3 and a half years between Q3'11 and Q1'15, the number of minutes originated from a fixed network has decreased by 109 minutes per residential customer (i.e. -40%)[30].

In the meantime, the average mobile voice call volume per residential subscriber is regularly increasing (from 188 in Q3'11 to 206 in Q1'15) and is now above the average fixed voice call volume per residential subscriber[31]. However, currently substitution between fixed and mobile calls is not yet effective (see § 3.2.2.3.1).

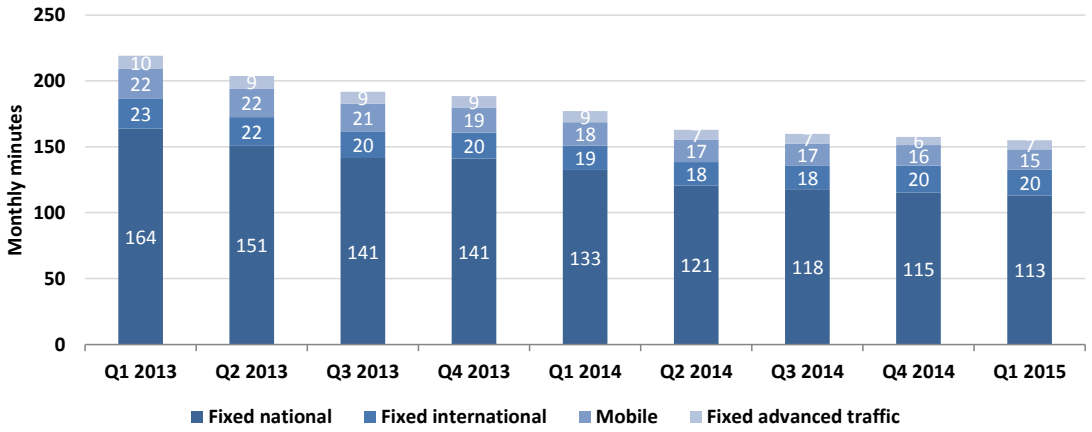
Despite this decrease, the volume of fixed voice calls remains higher than 2.5 hours per month (it was higher than 4 hours in Q1'11) compared to slightly less than 3.5 hours per month for mobile. The volume of fixed voice calls per residential subscriber in Ireland in 2013 (around 200 minutes) is similar to the values observed in the UK,

[30] ComReg quarterly reports

[31] 154.8 minutes per month and per fixed residential subscriber, 206.5 minutes per month and per mobile residential subscriber in Q1-15. Source: http://www.comreg.ie/_fileupload/publications/ComReg1549.pdf. However, a fixed residential subscriber corresponds to several mobile residential subscribers (because there is in general one fixed residential subscriber per household and as many mobile residential subscribers as people in the household)

Spain, Netherlands, France and Korea but lower relative to the values observed in the latter countries[32].

Figure 2 - Voice Call Volume originated from a fixed network per residential subscriber (Minutes)



Source: ComReg, Quarterly report Q1 2015 (http://www.comreg.ie/_fileupload/publications/ComReg1549.pdf)

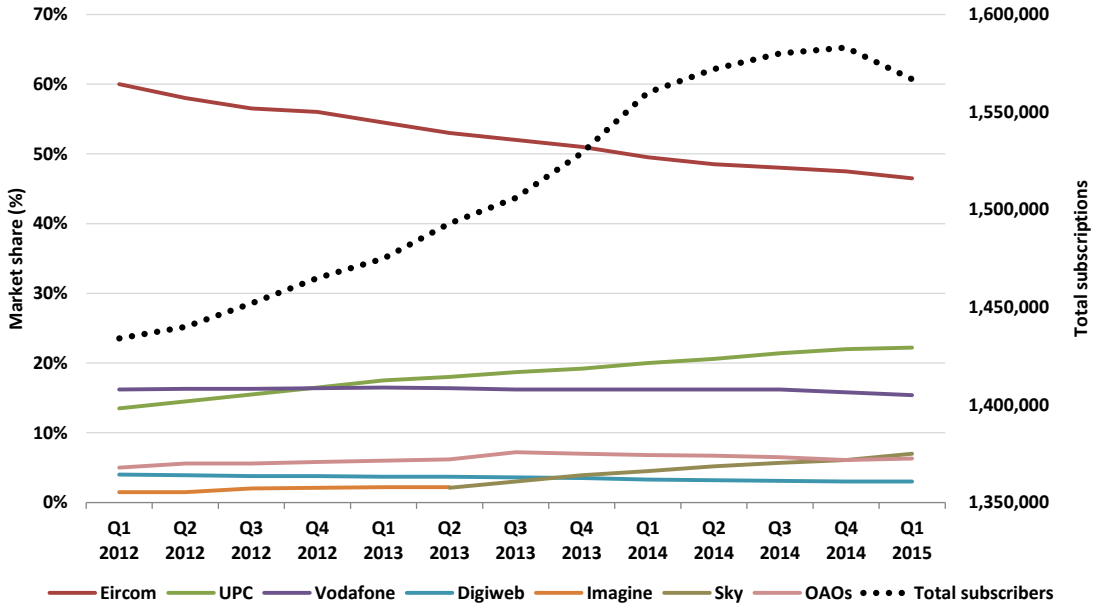
3.1.1.2 Fixed telephony lines

Total number of fixed telephony lines: broadband and narrowband

While the number of fixed calls has decreased, the total number of retail fixed telephony subscriptions has experienced a significant growth over the last few years (see Figure 3). Q1'15 is the first quarter with a decreasing number of fixed line telephony subscriptions with 1,566,792 subscriptions in total (it was around 1,400,000 in Q1'11).

[32] Source: Ofcom, International Communications report, 11 December 2014, page 258 and ComReg quarterly report for Ireland

Figure 3 - Fixed line telephony subscriptions (Q1 2012 - Q1 2015)



Source: ComReg, Quarterly report Q1 2015 (http://www.comreg.ie/_fileupload/publications/ComReg1549.pdf)

Standalone voice versus bundles

The strongest observed growth is from UPC and Sky whose market shares of fixed line telephony subscriptions have steadily increased. This growth has been highly supported by the growing popularity of bundled packages that now represent over half of fixed line telephony subscriptions:

> *"In Q1 2015, 46.7% of fixed market retail subscriptions were single play compared to 47.1% in Q1 2014,30.3% of subscriptions were double play (a bundle of two services)compared to 34.6% in Q1 2014 and 23.0% were triple play (a bundle of three services) and quadruple play (a bundle of four services) compared to 18.3% in Q1 2014."*[33]

This analysis also demonstrates that 46.7% of the lines are single play lines. However, this figure cannot be used definitively to assess the need for voice AFL USO because it includes all standalone subscriptions e.g. as well as voice only lines it also includes broadband only lines and TV only lines and therefore does not reflect how many fixed lines support voice only. The survey of households with fixed telephony access

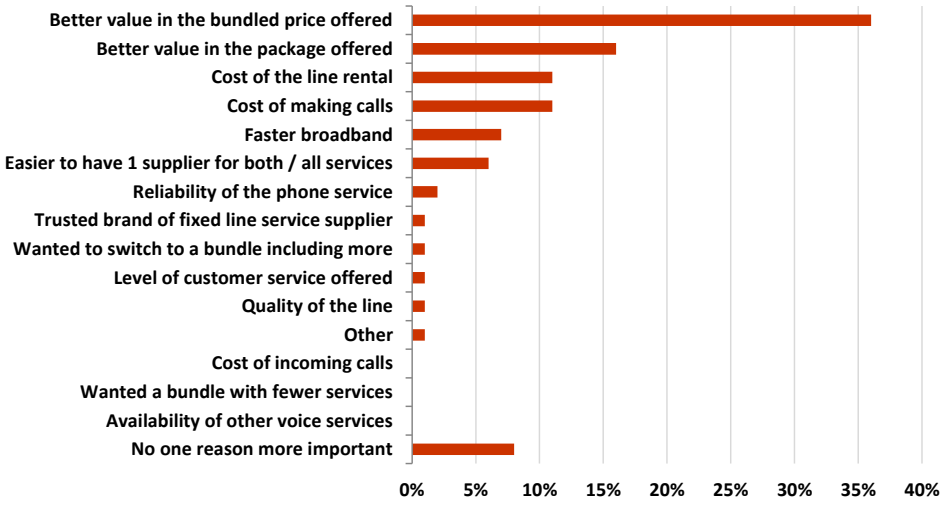
[33] *"Double play subscriptions can refer to either fixed telephony and internet or television or mobile telephony; television and the internet; mobile telephony and internet or television subscriptions. Triple play subscriptions can refer to fixed telephony and internet and television; fixed telephony and mobile telephony and internet; fixed telephony and mobile telephony and television; or, mobile telephony and internet and television subscriptions. Quadruple play subscriptions refer to fixed telephony, internet, television and mobile subscriptions."* - Source: ComReg, Quarterly report Q1 2015 (http://www.comreg.ie/_fileupload/publications/ComReg1549.pdf)

conducted by ComReg in 2012[34] indicated that 28% of households with fixed line voice telephony were buying voice services on a standalone basis, and not in a bundle with broadband or other services[35].

Also, the 2012 market survey highlighted that the use that is made of the AFL highly depends on the age: 95% of 65+ year old end-users mainly use the AFL for voice services whereas less than half of the 35- year old end-users do so[36]. For the youngest end-users fixed line is often used for broadband services only or for both voice and broadband purchased in a bundle.

According to the 2012 market survey, of households with fixed telephone access, 'the search for better value in bundle offers' is most often reported by respondents as the top reason for their choice for having switched fixed line access provider recently (see Figure 4):

Figure 4 – Top reason for selecting fixed line supplier when switching in the last 3 years



Source: http://www.comreg.ie/_fileupload/publications/ComReg12117a.pdf

The development of bundled offers alters the way a share of the population is purchasing AFL because, by definition, the price of fixed access and voice service are not identified separately, rather consumers purchasing a bundle think about the joint or total cost of the package. However, a significant share of the population is still purchasing standalone voice (see §3.1.2 for details about pricing and affordability).

[34] Attitudinal surveys of retail consumer and business users of fixed telephony services. ComReg 12/117a http://www.comreg.ie/_fileupload/publications/ComReg12117a.pdf

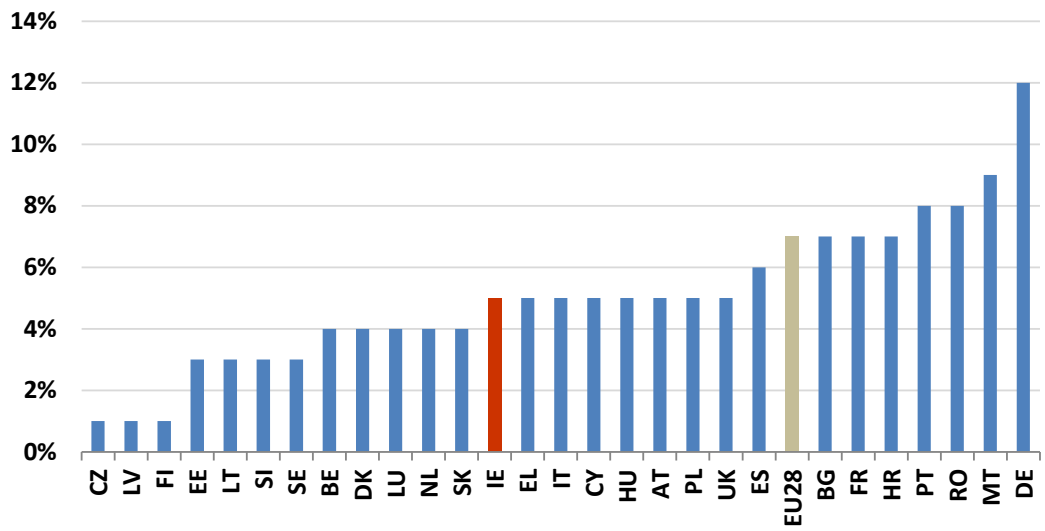
[35] ComReg 11/117a (http://www.comreg.ie/_fileupload/publications/ComReg12117a.pdf) - p19

[36] http://www.comreg.ie/_fileupload/publications/ComReg12117a.pdf

Fixed telephony line versus mobile telephony line

According to a Eurobarometer survey, fixed telephone access is the only means to make calls for 5% of Irish households – they do not have a mobile telephone access along with their fixed telephone access (see Figure 5). This figure is in the middle range of European countries. It decreased by 1 percentage point between 2013 and 2014 while it decreased by 2 percentage points in the whole European Union.

Figure 5 - Proportion of households having a fixed telephone access but no mobile telephone access (2014)



Source: Eurobarometer (https://ec.europa.eu/digital-agenda/en/news/special-eurobarometer-414-e-communications-household-survey)

Additionally this survey highlights that the majority (52%) of households in Ireland combine a fixed telephone access and a mobile telephone access (dual telephony access) against 61% at the European level. ComReg's 2012 market survey of households highlights the reasons for retaining a fixed telephony line in the home (only top six reasons are quoted below, those where 50% or more of the respondents have said this was a valid reason for them):

- 73% say it is because it is cheaper to make some types of calls;
- 64% say it is because they prefer to use their fixed line phone rather than their mobile phone when making longer calls;
- 61% say it is because they have always had one and do not see a reason to not have one now;
- 58% say it is because of the use of a phone in cases of emergency (NB: this reason is only valid when the PSTN technology is used);
- 55% say it is because of the quality of the line during a phone call;
- 54% say it is because they need a broadband connection and the phone line is linked to it.

3.1.1.3 Increase use of VoIP

In its RFVA Decision,[37] ComReg underlines the take-up of managed VoIP subscriptions and anticipates that this trend will go on in the future:

> *"As of Q4 2013, broadband with managed VOIP subscriptions accounted for approximately 22% of total fixed telephony subscriptions (up from 14.8% in Q4 2011). In addition, managed VOIP minutes accounted for approximately 12% of total fixed voice minutes (up from 8.0% in Q4 2011). ComReg expects this trend to continue and would note that it is consistent with the findings across other Member States, as reported in Ecory's report."*

In the same report, ComReg underlines growing service substitutability between broadband connections that offer FVA functionality (managed VOIP service) and narrowband FVA and concludes that *"broadband connections are increasingly facilitating the delivery of managed VOIP and may increasingly act as a constraint on narrowband PSTN/ISDN voice and, ultimately, the PSTN/ISDN connection"*.[38]

A number of over the top (OTT) suppliers such as Skype, Viber or Google Voice offer voice services via an "unmanaged" VoIP solution. While the take up on VoIP is increasing, the actual usage of these services in Ireland remains limited for now since results from 2013 Residential ICT Survey[39] show 43% of respondents reported that they never used unmanaged VoIP services at all.

Based on this market evolution of VoIP, Eircom considers that the legacy PSTN network could be removed in ✂. ComReg in the Wholesale Fixed Voice Call Origination and Transit Markets review noted, in relation to NGA areas in particular:

> *"Within at least the NGA area, ComReg would expect that an Eircom managed VOIP service would ultimately replace the traditional circuit switched voice over Eircom's copper based narrowband network. However, recent evidence indicates that VDSL broadband subscriptions (either Eircom retail or Access Seekers providing retail services using wholesale VDSL purchased from Eircom) stood at ✂ as at December 2013. Although Eircom provides VDSL broadband it still provides FVA over its narrowband copper network. Upon the roll-out of Eircom's managed VOIP platform, ComReg considers that asymmetric switching is likely to occur away from narrowband FVA in particular for end users that value broadband, though given the relevant timeline such a development will not sufficiently constrain narrowband FVA over the period of the review."*[40]

[37] ComReg 2014/89

[38] Ibid.

[39] ComReg Consumer ICT Survey, April 2013, ComReg document 13/46 and ComReg Business ICT Survey, May 2013, ComReg document 13/61 (quoted in ComReg 14/89)

[40] ComReg 14/26 (http://www.comreg.ie/_fileupload/publications/ComReg1426.pdf)

While the increasing use of VoIP is an important development in Ireland, this aspect is not directly relevant to AFL USO as the VoIP technology is in fact progressively replacing the PSTN technology but this migration occurs over physical lines which already support AFL. As a consequence, the managed VoIP technology has the potential to secure the provision of voice AFL USOs from new deployed networks relying on the IP technology (see §3.2.2).

3.1.2 Affordability and price sensitivity

3.1.2.1 Evolution of retail prices over the last few years

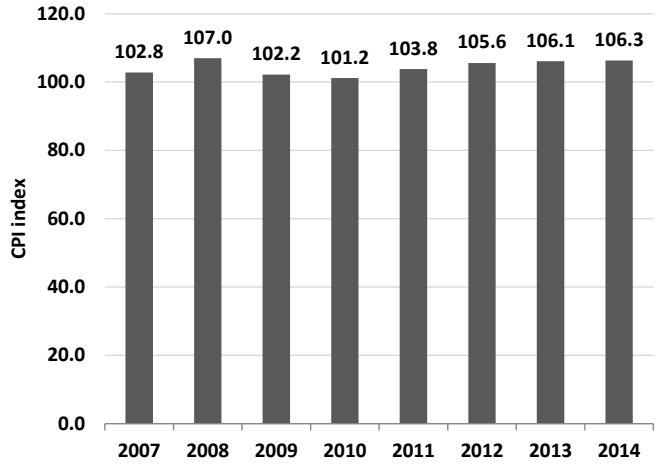
A retail price control (amongst others, a price cap mechanism) is imposed on retail line rental.[41] The retail price cap which relates to consumer's standalone fixed voice access services i.e. line rental and connection fees (excluding voice calls) does not allow Eircom to increase the retail line rental price by more than the rate of inflation (i.e. CPI-0).

In spite of this allowance to increase the line rental retail price with the CPI in a given year, it remained unchanged over the period since 2007. The retail price currently is at €20.96 VAT excluded (however, it is to be noted that the price inclusive of VAT included increased in 2012 to €25.78). The last increase (excluding increases related to VAT rate changes) occurred in October 2007 with a €1.18 VAT included increase. However, this price stability paralleled a period of significant recession and deflation. Inflation on an annual basis was negative between 2008 and 2010 (which means that in real terms, the line rental increased). Since 2010, it is noted that on the one hand that the CPI has marginally increased, on the other hand competition emerged more strongly from other operators (primarily UPC). Additionally it is noted that despite the significant depression and recession that occurred in Ireland, the line rental price which was the 4th most expensive in the whole of European Union after Luxembourg, Sweden and Finland[42] remained stable.

[41] Pursuant to ComReg Decision D12/14 on the retail fixed voice access market ('RFVA Decision') – http://www.comreg.ie/_fileupload/publications/ComReg1489.pdf

[42] Source : European Commission, electronic communications market indicators (October 2011)

Figure 6 - CPI evolution 20117-2014



Source: http://www.cso.ie/quicktables/GetQuickTables.aspx?FileName=CPA01C1.asp&TableName=Annual+Figures+2007+to+2013&StatisticalProduct=DB_CP

More recently many retail telecommunications prices increased in Ireland, amongst others, individual call prices and the prices of voice bundles. However, the standard line rental price remains unchanged[43]. It is noted that the wholesale line rental (SB-WLR) price decreased by €3 in 2013 and 2014 when bundled with broadband and in Large Exchange Areas ("LEA").[44] Eircom's wholesale promotion in respect of SB WLR provided Eircom and other operators' with scope to lower bundle prices subject to certain terms and conditions but not standalone prices. Also, Eircom sometimes applies promotions on one-off charges (see a very recent temporary offer by Eircom below). But again, the headline line rental standalone price has remained stable.

[43] https://switcher.ie/broadband/news/eircom-announce-price-increase-from-april-2015/

[44] ComReg has previously identified a "Large Exchange Area" or ('LEA') which comprises those exchange areas where inter alia there is the presence of cable infrastructure (i.e. UPC Communications Ireland Limited ('UPC')), LLU based competition and, prospectively, the potential for the roll out of next generation access ('NGA'). Areas outside the LEA (i.e. 'Outside the LEA') are those areas which have less/no infrastructure based competition. See §3.2.3 for more details

Figure 7 - Example of retail AFL rental discount

eircom Consumer €5 opt-in contract promotion
(effective from 1st April 2015 to 31st December 2015)

PSTN	PSTN Line Rental (ex. VAT)	PSTN Line Rental **(inc. VAT)**	Once-off Promotion Discount (ex. VAT)	Once-off Promotion Discount **(inc. VAT)**
PSTN Monthly Line Rental	€20.96	**€25.78**	€4.07	**€5.00**

Source: http://www.eircom.net/opencms/export/sites/default/.content/pdf/terms/internet_special_offer.pdf

Eircom also offers lower priced packages, though the PSTN monthly line rental either is offered with higher calls prices beyond a certain allowance of minutes (VUS, see below) or are available to restricted categories of people (Eircom Talktime control, see below):

- Vulnerable User Scheme (VUS) is a low user package[45]:
  - Charge of €25.22 including VAT (€20.50 ex. vat) per month to include Line Rental and a Call Allowance of up to €8.07 (€6.56 ex. vat) on Eligible VUS Calls.
  - Above that threshold, calls can be billed up to double standard rate[46].
- Eircom Talktime Control is a package for low income users (available for sale from 1st February 2013 to 30th June 2015)[47]:
  - From 1 January 2014 Talktime Control is only available to existing eircom customers who were in receipt of the Department of Social Protection's "Telephone Allowance" at 31st December 2013 via their eircom phone bill;
  - For eircom customers who were in receipt of the Department of Social Protection's "Telephone Allowance" at 31st December 2013 Eircom Talktime Control carries a subscription charge of €22.50 including VAT (€18.29 ex. VAT) per month to include Line Rental and a Call Allowance of up to €5.00 including VAT (€4.07 ex. VAT) on Eligible eircom Talktime Control Calls.

[45] http://www.eircom.ie/bveircom/pdf/Part2.3.3.pdf

[46] http://www.eircom.ie/bveircom/pdf/Part2.3.3.pdf

[47] http://www.eircom.ie/bveircom/pdf/Pt2.3.7.pdf

3.1.2.2 Price sensitivity

In order to assess the potential future price changes that would be proposed by AFL suppliers absent any USO (see §4), two analyses are required: an assessment of the degree of any competitive constraints from alternative infrastructures (see §3.2) and an understanding of AFL customers price sensitivity. The objective of this section is to estimate to what extent AFL customers in Ireland are sensitive to AFL prices and to estimate affordability.

ComReg's 2012 market survey of households with fixed telephony access[48] considered the potential degree of sensitivity among households to increased charges and any resultant impact on potential switching or cancelling of the fixed subscription. It is important to keep in mind that surveys, while a useful practical means of gathering information on consumer and business preferences/behaviours, need to be interpreted with care and that stated preferences of survey respondents can overestimate what they will actually do in practice (for example for questions relating to prices).

The findings of the 2012 market survey relating to price sensitivity for residential customers who are indicative only are described below: [49]

- The average bill paid by households purchasing a fixed line calls voice service (not bundled with other services such as broadband, TV, etc.) amounts to €57.6 VAT included per month (though, about 45% of surveyed customers report paying a monthly average bill of more than €70). Line rental represents €25 VAT included as explained above (i.e. around 45% of the average bill).
- Most responding households believe that fixed line phone charges are more affordable than calls from mobile phones[50]; this perception being for all call categories (national/international fixed calls, premium rate numbers, 1800 numbers, directory inquiries, off-net mobile calls) except for on-net mobile calls where making on-net mobile calls from mobile phones is still cheaper for 54% of respondents.

[48] ComReg, Market Review, "Retail Access to the Public Telephone Network at a Fixed Location for Residential and Non Residential Customers", Ref. 12/117a, 10/2012.

[49] It is important to highlight that the results of surveys carried out are generally not sufficient to draw definitive conclusions across all aspects of consumer preferences. It is more appropriate to consider survey results alongside other available evidence and analysis, where such additional evidence is available.

[50] Among households with fixed line voice telephony: 16% believe that calls to national fixed line phones are more expensive when originated from fixed lines (68% when originated from mobile); 36% believe that calls to mobile phones on a different network are more expensive when originated from fixed lines (42% when originated from mobile); 16% believe that calls to international are more expensive when originated from fixed lines (60% when originated from mobile); 11% believe that calls to premium rates numbers are more expensive when originated from fixed lines (49% when originated from mobile); 13% believe that calls to directory enquires are more expensive when originated from fixed lines (43% when originated from mobile); 9% believe that calls to 1800 numbers are more expensive when originated from fixed lines (32% when originated from mobile); 10% believe that calls to call save numbers are more expensive when originated from fixed lines (44% when originated from mobile). (Source: http://www.comreg.ie/_fileupload/publications/ComReg12117a.pdf - slide 36)

- The level of residential customer awareness of line rental charges itself is limited as well as only a very limited share of customers surveyed consider the cost of calls and the costs of line rental separately (9.6% of the total population, i.e. 15% of the population with a fixed line).
- Only 26% of respondents had switched supplier in the last three years.
- The table below summarizes retail customers reported reaction to a 10% price increase by their fixed line supplier in respect of fixed telephony services:

Table 5 – Customers reported reaction to a 10% increase in price for fixed telephony services

	63% of the population has a fixed line		
	10% think about line rental and call separately and are not on a bundle[51]	15% do not think about line rental/calls separately and are not on a bundle[52]	38% are on a bundle and think about line rental and calls as a joint package[53]
% that would definitely or maybe change behaviour in reaction to a 10% retail line rental price increase or total cost of the bill or package	62% (n=59)	44% (n=152)	59% (n=380)
Total that would definitely or maybe change behaviour in reaction to a 10% retail line rental price increase or total cost of the bill or package	35% of the population, i.e. 56% of population with a fixed line		
% that would cancel subscription with fixed line provider among those that would definitely or maybe change behaviour in reaction to a 10% retail line rental price increase or total cost of the bill or package[54]	39% (n=23)	24% (n=67)	33% (n=77)
Total that would cancel subscription with fixed line	11% (= 35% x 33%) of the population, i.e. 18% (=11%/63%) of the population with a fixed line		

[51] Respondents aware of call cost and line rental separately were asked about increases in line rental charges and increases in call costs.

[52] These respondents not aware of access and calls charges separately were asked about increase in the total cost of access/calls bill.

[53] Respondents on bundle, asked about increase in the bundle price.

[54] The number of respondents to sub scenarios is based on small numbers.

provider in reaction to a 10% retail line rental price increase or total cost of the bill or package	

Source: TERA Consultants analysis of ComReg 12/117a

Of those surveyed, among the population with a fixed line who reported that they would cancel a subscription in response to a 10% retail line price increase (this represents 18% of the population with a fixed line, see table above), the majority (e.g. of the 38% only, 11% state they would line drop and go mobile only) would use mobile voice and mobile broadband only (see Table 6). This percentage is greater for standalone voice customers compared to customers purchasing voice in a bundle. It is to be noted that the number of respondents to this topic is low (167 in total), therefore values must be considered carefully.

Table 6 – Action after cancelling subscription with fixed line provider (for those that would cancel subscription with fixed line provider in reaction to a 10% retail line rental price increase)

	63% of the population has a fixed line		
	10% think about line rental and call separately and are not on a bundle (n=23)	15% do not think about line rental/calls separately and are not on a bundle (n=67)	38% are on a bundle and think about line rental and calls as a joint package (n=77)
Give up my fixed line connection and use my mobile phone instead	52%	69%	11%
Give up my fixed line connection - use mobile phone & mobile broadband	22%	0%	16%
Switch to another fixed line supplier	26%	31%	73%

Source: TERA Consultants analysis of ComReg 12/117a

In the case the customer who cancels its subscription switches to another traditional fixed line subscriber relying on SB-WLR (e.g. to Sky), Eircom would no longer earn revenues from the retail line rental. However, Eircom would still earn revenues from SB-WLR. In other words, by increasing retail prices by 10%, Eircom would take the risk to see some customers churning and to lose revenues from the retail line rental but this

risk could be mitigated by the fact that those customers would still generate wholesale revenues. As a consequence, on the basis of the survey, the share of customers that would cancel subscription with fixed line provider in reaction to a 10% price increase with all revenues (both retail and wholesale) being lost for Eircom represents 8.8% of the population, i.e. 13.8% of the population with a fixed line[55].

Table 7 – % of population with fixed line that would cancel subscription with revenues lost for Eircom

	63% of the population has a fixed line		
	10% think about line rental and call separately and are not on a bundle	15% do not think about line rental/calls separately and are not on a bundle	38% are on a bundle and think about line rental and calls as a joint package
% of population with fixed line that would cancel subscription with fixed line provider among those that would definitely or maybe change behaviour in reaction to a 10% price increase - Revenues lost for Eircom	20.5%	10.6%	13.6%
	In average 13.8%		

Source: TERA Consultants analysis of ComReg 12/117a

3.1.3 Internet access demand

Along with telephony and facsimile services, the Universal Service Directive and its implementation in Ireland ensure that AFL is able to support a Functional Internet access. This section analyses the current demand for FIA: the availability and speed of FIA is first described (see §3.1.3.1), then a focus is made on narrowband Internet access users (see §3.1.3.3) and finally Internet access price and affordability is discussed (see §3.1.3.2).

3.1.3.1 FIA availability and speeds

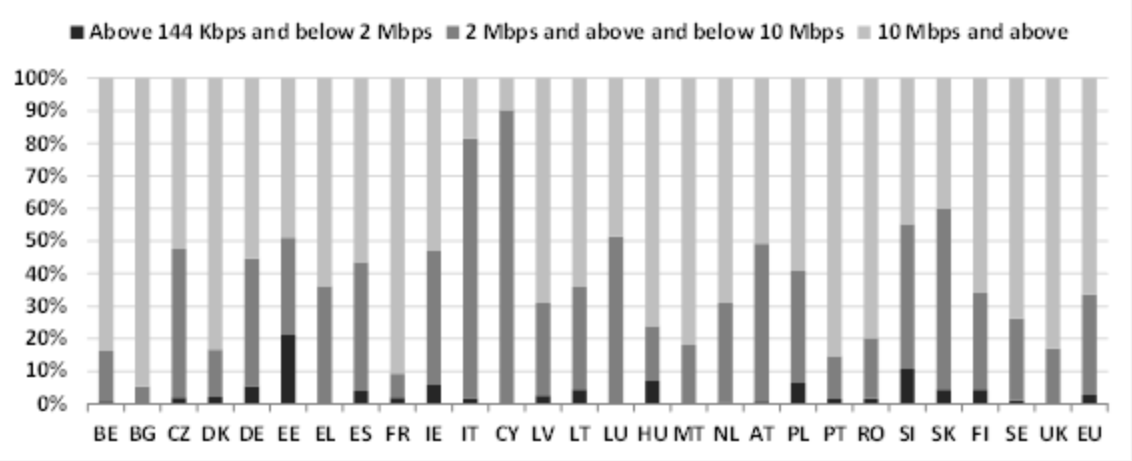
FIA can in principle be supported by a narrowband internet access or by a broadband internet access connection. Narrowband internet access is generally the cheapest means to get access to the internet at home (see §3.1.3.3).

[55] It is assumed that those answering "Switch to another fixed line phone supplier and I don't mind which type" would switch to a traditional fixed line phone supplier and to a tv cable supplier in the same proportion as those answering "Switch to a traditional fixed line phone supplier" and "Switch to a fixed line phone provided by a tv cable supplier" respectively.

In Q1 2015, there are 1,276,765 Internet subscriptions provided at fixed location[56] in Ireland. The majority of fixed internet subscriptions are broadband subscriptions, only 0.5% of Internet subscriptions are narrowband subscriptions.

In Ireland, like in the rest of Europe, the vast majority of broadband customers have access to speed greater than 2 Mbps and the majority have access to speed greater than 10 Mbps. A relatively small proportion of households has internet access speeds above 144 kbps and below 2 Mbps. Therefore, customers with narrowband Internet access have speeds significantly lower than the vast majority of the population in Ireland which can lead to social exclusion.

Figure 8 – Distribution of broadband speeds in each European country (January 2014)



Source: European Commission, Broadband indicators

Even if TERA Consultants has not been able to collect information about line capabilities in Ireland, it is likely that some of the lines cannot support more than narrowband Internet access because they are too long. Indeed, outside areas covered by UPC's cable TV network, broadband is mainly provided over Eircom's copper access network and copper lines can support broadband only if they are not too long. When they are too long, only narrowband Internet access is available. The diagram below shows the distribution of Eircom's copper lines with the length of these lines.

Figure 9 – Distribution of copper line length in Ireland

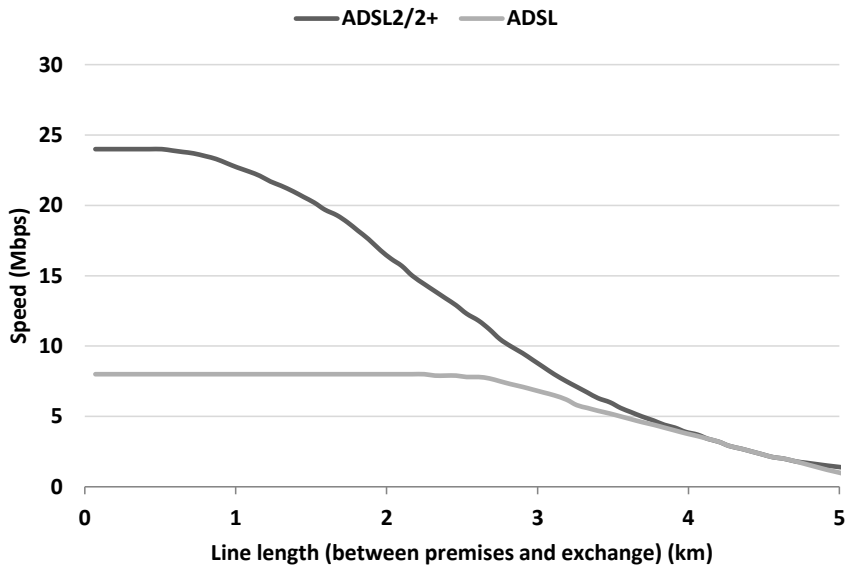
✂

✂% of Eircom's copper lines are longer than 2km, ✂% are longer than 5 km and ✂% are longer than 7 km. Considering the capabilities of the DSL technology as represented in the figure below, it is likely that a small but unneglectable share of

[56] The total figure of internet subscriptions in Q1 2015 is 1,711,957 but mobile broadband subscriptions have been removed.

customers in Ireland can only get narrowband Internet access from a fixed wired network. **In particular, over 1Mbps being typically available for lines shorter than 5km, this means that ✂% of the population have access to speed greater than 1Mbps.**

Figure 10 - Available Speed depending on the line length (ADSL/ADSL2)

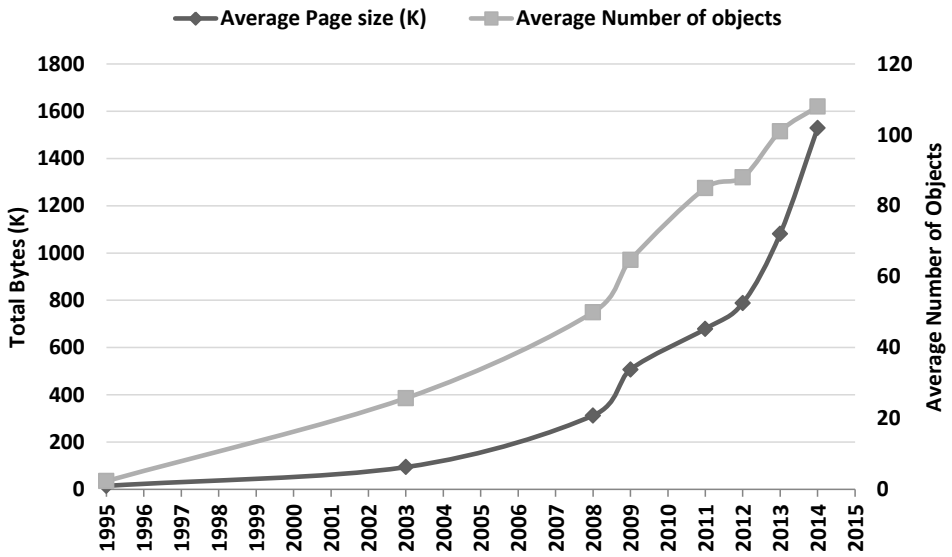


Source: http://www.increasebroadbandspeed.co.uk/graph-ADSL-speed-versus-line-loss-distance

The Universal Service Directive does not define the meaning of "Functional Internet Access". However, for the purpose of this report, "Functional Internet Access" is understood as basic Internet use. This mainly corresponds to web access or email but does not include the download of enriched content (such as video) or the use of applications requiring higher upload speeds.

When the minimum data rate of 28.8 kbps for FIA was set in 2005 by ComReg, the average size of a web page was circa 180 kilo bytes (KB). With a 28.8 kbps connection, it was taking 50 seconds to download a web page. In July 2014, the average size of a web page is circa 1,600 KB (see Figure 11). With a 28.8 kbps connection, it takes 7 minutes and 24 seconds to download a webpage (assuming 28.8 kbps is fully available during the whole download period of time).

Figure 11 – Evolution of average web page size and number of objects (beginning of year)



Source : http ://www.websiteoptimization.com/speed/tweak/average-web-page/

In contrast, the average size of email attachment has remained relatively stable (from 460 KB in 2009 to 500 KB in 2013[57]).

3.1.3.2 Focus on narrowband Internet access customers

With the development of broadband services, the number of customers requiring low speed Internet access services (dial-up) has decreased significantly over the last years (see Figure 12) and is expected to further decrease over time.

Figure 12 – Evolution of the number of narrowband Internet access customers in Ireland

✂

At July 2014, there were ✂ narrowband Internet access customers representing ✂ of Ireland PSTN working lines. However, these are not distributed homogeneously among the territory: narrowband Internet access customers can represent over ✂% of PSTN working lines in several areas of Ireland (see Figure 13).

[57] http://www.radicati.com/wp/wp-content/uploads/2009/05/email-stats-report-exec-summary.pdf

Figure 13 - Narrowband Internet access customers as % of PSTN working lines (2014)

✂

There is some correlation between the location of narrowband Internet access customers and the types of areas. Narrowband Internet access customers tend to be located in the most remote areas, within the smallest exchanges i.e. where the number of PSTN working lines is lower (see Figure 14)[58].

Figure 14 - % of narrowband customers depending on the number of working lines within MDF areas

✂

For example, in the county of Kildare, there is one Eircom's exchange labelled "ALW" (see Figure 15) which exhibits a higher share of narrowband Internet access customers: ✂

Figure 15 – Location of ALW exchange area

✂

3.1.3.3 FIA affordability

For certain end users narrowband Internet access is their only Internet access option. Possibly, for some customers, take up of narrowband over broadband is not due to the too long length of their copper line but to the fact that they can afford to pay for a narrowband connection but not for a broadband connection. As a consequence, some customers could accept to experience very poor levels of quality of service (see previous section) because they cannot afford to pay for broadband. For these customers, FIA is likely to be very important but broadband is too expensive.

The price difference between Eircom's cheapest narrowband Internet access offer and Eircom's cheapest broadband plan is €10.16 VAT included. Indeed, to get the cheapest broadband offer, an end user would have to pay €20.32[59] per month VAT included (in addition to the line rental) for the Eircom broadband Time package. Whereas to get a flat rate narrowband Internet access, it would have to pay €10.16 per month VAT included (in addition to the line rental, see table below). This €10.16 difference can

[58] NB: small exchanges are not necessarily located in remote areas but the vast majority of them are

[59] Eircom broadband Time, 1024kbps Downstream / 128kbps Upstream (http://www.eircom.ie/bveircom/pdf/Part3.1.pdf)

represent a significant barrier to the part of the population which is very price sensitive and heavily constraints by its income. For this part of the population, paying and extra €10.16 per month to get broadband access may not be possible. It is noted that Eircom also sells standalone broadband offers which are at about the same price level as line rental + narrowband (€35 VAT included). However, these offers are only available where Eircom's Next Generation Broadband network has been deployed and do not include any voice solution.

Figure 16 – Eircom narrowband Internet plans

Partial Flat rate internet acces	€ per month Incl. VAT	€ per month Excl. VAT
Flat rate 25 hours (1893 25 25 25) Evening & Weekend	10.16	8.2562
Flat rate 60 hours (1893 60 60 60) Evening & Weekend	20.32	16.5207
Anytime 150 hours (1893 150 150) Day, Evening & Weekend	30.49	24.7851

Source: http://www.eircom.ie/bveircom/pdf/Part2.1.pdf

Figure 17 – Eircom's broadband price list

eircom Price List (Amendment No 6) 2015

Part 3.1
eircom broadband (Asymmetric Digital Subscriber Line)

Level	Bandwidth (up to)	Monthly Download Limit (5) (18)	Monthly Upload Limit (5)	Standard Connection charge		Self-Install Charge (12)(13)(15)		Monthly Rental	
				ex. vat	inc. vat	ex. vat	inc. vat	ex. vat	inc. vat
eircom **broadband Time**	1024kbps Downstream / 128kbps Upstream	n/a	n/a	€81.81	€100.63	€24.68	€30.36	€16.52	€20.32
eircom broadband Advanced	24576kbps Downstream / 768kbps Upstream	30GB combined		€81.81	€100.63	€24.68	€30.36	€22.65	€27.86
eircom broadband Advanced Unlimited	24576kbps Downstream / 768kbps Upstream	Unlimited combined		€81.81	€100.63	€24.68	€30.36	€26.79	€32.95
# eircom **broadband home starter** (19)	1024kbps Downstream / 128kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€24.68	€30.36	€20.65	€25.40
# eircom **broadband home plus**	3072kbps Downstream / 384kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€24.68	€30.36	€24.79	€30.49
# eircom **broadband home Advanced**	7168kbps Downstream / 384kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€24.68	€30.36	€32.91	€40.48
# eircom **broadband home turbo**	24576kbps Downstream / 768kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€24.68	€30.36	€39.66	€48.78
eircom **broadband business lite** (19)	1024kbps Downstream / 128kbps Upstream	10GB	1GB	€81.81	€100.63	€24.68	€30.36	€20.65	€25.40
~eircom **broadband business lite plus**	3072kbps Downstream / 384kbps Upstream	30GB	Unlimited	€81.81	€100.63	€24.68	€30.36	€24.79	€30.49
~eircom **broadband business starter**	12288kbps Downstream / 1126kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€0.00	€0.00	€40.00	€49.20
* eircom **broadband business plus**	4096kbps Downstream / 384kbps Upstream	60GB	Unlimited	€81.81	€100.63	€0.00	€0.00	€89.00	€109.47
eircom **broadband business plus 12**	12288kbps Downstream / 1024kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€0.00	€0.00	€65.00	€79.95
* eircom **broadband business enhanced**	6144kbps Downstream / 512kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€0.00	€0.00	€169.00	€207.87
* eircom **broadband business enhanced 12**	12288kbps Downstream / 1024kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€0.00	€0.00	€169.00	€207.87
eircom **broadband business enhanced 12/2**	18432kbps Downstream / 2048kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€0.00	€0.00	€99.00	€121.77
eircom **broadband business Advanced**	24576kbps Downstream / 1024kbps Upstream	Unlimited	Unlimited	€81.81	€100.63	€0.00	€0.00	€65.00	€79.95
eircom **broadband Temporary Line** (10)	4096 kbps Downstream / 384kbps Upstream	Unlimited	Unlimited						
With Internal Wiring				€561.00	€690.03				
Without Internal Wiring				€371.00	€456.33				
Technician Callout Charge (13)		ex. Vat	€81.81	inc. Vat	€100.63				

* from 21st May 2009 no longer available to new customers
# from 15th January 2015 no longer available to new customers

Also, a significant proportion of the population currently have no Internet access which can be for price and non-price reasons. In this respect ComReg's analysis of the RFVA market highlighted that lack of fixed line Internet access is closely linked to social grade and age but also to purchasing power:

> *"For consumers without a broadband connection, after not needing internet access, the most common reason for not having broadband is a wish to reduce household bills. These customers are not likely to immediately switch their FVA access to a broadband and voice bundle given the focus of their demand and/or likely transaction costs associated with the purchase of broadband including in a bundle.*
>
> *[…] the price 'gap' based on their valuation is possibly too large to move away from narrowband FVA."*[60]

3.1.4 Conclusion on consumer trends (demand side)

- The demand for voice services remains stable and voice remains a key communications service for end-users;
- The number of AFL subscriptions has steadily increased over the last couple of years buoyed by popularity of bundled offers, although fixed originated calls volumes are decreasing;
- Despite a decrease in call volumes and despite a very large availability of mobile networks to make voice calls, on average customers still use their fixed line to make calls during more than 2.5 hours every month. Fixed voice traffic still represents one quarter of total voice traffic in Ireland;
- There is still an unneglectable percentage of the population which mainly uses the AFL for voice services (95% of 65+) or which only have a fixed line and no mobile line (5%);
- A significant proportion of households with a fixed line are fixed voice only lines (28% in 2012) these customers buying voice on a standalone basis;
- Use of managed VoIP is increasing and this has the potential to secure the provision of voice AFL USOs over new networks relying on the IP technology. ✂;
- Reaction to a significant AFL price increase is very heterogeneous among customers. However, based on a market survey of households with fixed telephony access, it appears that a significant proportion of the population would cancel their subscription if prices for fixed voice access & calls were to increase by 10%;

[60] ComReg 14/89, §4.115 (http://www.comreg.ie/_fileupload/publications/ComReg1489.pdf)

- The retail line rental price has remained stable since October 2007, though Eircom could have increased it in line with inflation in the relevant year. This period of stability in the retail line rental price paralleled a significant period of recession and deflation in Ireland and a period of stronger competition. In 2011, the retail line rental price in Ireland was the 4th highest in the European Union;
- The majority of end users have access to Internet through a broadband connection which, in many cases has a speed greater than 10 Mbps;
- Demand for narrowband Internet access is low and decreasing.
- Narrowband Internet access, however, remains demanded for people with low income or for people whose copper line is too long.
- With a narrowband (28.8 kbps) connection, it takes on average 7 minutes and 24 seconds to download a webpage illustrating speeds which are significantly less than those achievable by way of a broadband connection.

3.2 Infrastructure trends (Supply side)

3.2.1 Infrastructures currently used by Eircom to provide AFL

Depending on the area, Eircom currently uses four different technologies to provide AFL (see Figure 18):

- Copper path;
- Shared Copper path;
- Rurtel;
- Fixed Cellular Service (FCS).

Figure 18 - Technologies currently used by Eircom to provide access at a fixed location (AFL)

Technology	Description	Functional Internet access	Facsimile
Copper line	A copper path dedicated to a customer from the local telephone exchange	✓	✓
Shared copper line	A copper path shared by more than one customer from the local telephone exchange (Pair gain)	✓	✓
Rurtel	A wireless solution	✓	✓
Fixed Cellular Service (FCS)	A solution using GSM	✗	✓

Source: Eircom (13D Response to IR on RAT & FIA 20Nov14)

Fixed lines platforms represent most of Eircom's AFL provision whereas wireless/mobile solutions are used in the case of terrain difficult to serve with fixed technologies.

All four access technologies are able to support national, and international telephone calls and facsimile. Copper line, Shared copper line and Rurtel support FIA. FCS does not. This means that currently FCS is not able to meet the requirements of FIA.

It is to be noted that PSTN/copper is the only fixed technology working during power blackouts as it is operated with an independent power supply. However, this does not make copper the only technology available for AFL since the Universal Service Directive does not refer to this capability for AFL[61]. The Universal Service Directive states in Article 23 (which is not specifically relevant for AFL): *"Member States shall take all necessary steps to ensure the integrity of the public telephone network at fixed locations and, in the event of catastrophic network breakdown or in cases of force majeure, the availability of the public telephone network and publicly available telephone services at fixed locations. Member States shall ensure that undertakings providing publicly available telephone services at fixed locations take all reasonable steps to ensure uninterrupted access to emergency services."* But this applies to any network not only the USP network.

Customer connection to the PSTN network is performed by the means of copper in the vast majority of cases. When a connection via copper is not considered viable, it may be manageable by a fixed cellular solution. However, the customer base for FCS has remained lower than ✂ over the last years (see Figure 19).

Figure 19 - Evolution of the FCS customer base

✂

FCS customers are rather located in less dense counties (see Figure 20).

Figure 20 – Distribution of FCS lines by county (2014) (the figures represent the number of FCS line per county as a percentage of the total number of FCS lines per county)

✂

Rurtel (Rural Telecommunications) is a service offered by Eircom in a very limited number of areas where deploying copper is considered as not viable. Eircom is

[61] See §2.1.1 above, which notes that the Universal Service Directive requires that there should be no constraints on the technical means by which AFL is provided.

licensed to use a 20MHz spectrum band[62] to offer this wireless service that uses a wired final connection from the pole to the customer premises in the majority of cases. Rurtel provides an analogue presented telephone and low speed data services (from 32kbps).

At the end of 2013, there are circa ✂ customers[63] on the Rurtel network. Eircom does not proceed to new Rurtel infrastructure deployment anymore and observes limited connection/reconnection activity every year.

3.2.2 Alternative infrastructures and future evolutions likely to have an impact on AFL USO

There are a number of market players in the different electronic communications markets in Ireland. A number of them rely on Eircom wholesale inputs to offer services at retail level. In this section, focus will be put on alternative access network infrastructures which could change the competitive environment as regards the AFL supply.

The following network infrastructures capable of providing AFL are described hereafter:

- Market-driven Next Generation fixed access networks (see §3.2.2.1) from:
  - Eircom (see §3.2.2.1.1),
  - UPC (see §3.2.2.1.2);
  - Siro (see §3.2.2.1.3);
- National Broadband Plan (see §3.2.2.2);
- Next Generation mobile/wireless technologies (see §3.2.2.3):
  - 3G & LTE from Eircom, Vodafone and Three/O2 (see §3.2.2.3.1);
  - Nomadic wireless broadband technologies (see §3.2.2.3.2).

Most if not all these infrastructures and platforms provide managed voice on the basis of the IP technology, while fixed voice has until now mainly provided on the basis of the legacy PSTN technology. The managed VoIP technology is currently replacing the PSTN technology and has the potential to secure the provision of voice AFL USOs on new deployed networks.

3.2.2.1 Market-driven Next generation fixed access networks

3.2.2.1.1 Eircom

In the future, Eircom considers[64] that next generation access (NGA) technologies will be the primary technologies to provide access at a fixed location.

[62] 2307-2327 MHz paired with 2407-2427 MHz.

[63] USO 13D request annual response - 2013

[64] See “13D Response to IR on RAT & FIA 20Nov14”

For its NGA network roll-out, Eircom envisages a number of technologies enabling to bring fibre more or less close to the end-user (see Figure 21).

Figure 21 – Wired technologies likely to be used by Eircom to provide AFL in the future

Technology	Description	Functional internet	Facsimile
FTTC/FTTN	Fibre to the cabinet / Fibre to the node Optical cabling terminates at the cabinet or a node. Existing copper line is used to connect the cabinet or the node to the end-user. FTTC is distant-dependant as the further away the end-user is from the cabinet, the lower the speed. This is considered as a significant first step to roll-out fibre.	✓	✓
FTTDP/ G.Fast	Fibre to the distribution point Optical cabling terminates at the distribution point. Existing copper line is used to connect the distribution point to the end-user. This architecture supports VDSL or G.Fast for very short copper drop connections. G.Fast will be commercially available in late 2016 and could be used by Eircom.	✓	✓
FTTB	Fibre to the building Optical cabling terminates at the building (usually a multiple dwelling building). Delivery of service to the end-user can be performed using a number of methods including VDSL or G.Fast.	✓	✓
FTTH	Fibre to the home Optical cabling reaches individual home or business. The latest commercially available GPON arcjitectures are capable of delivering 2.5 Gbps downstream and 1.25 Gbps upstream.	✓	✓

Source: Eircom (13D Response to IR on RAT & FIA 20Nov14)

Eircom confirms that all the NGA technologies listed above will provide facsimile services:

> *"NGA technologies, together with a VoIP service will provide for facsimile communications through the support of the G711 codec and the detection of voice-band data events in the gateways. T38 FAX operation will also be supported".*[65]

[65] See "13D Response to IR on RAT & FIA 20Nov14"

Eircom is currently investing over €400 million to deploy NGA services to 1.6 million premises nationally[66]. According to Eircom, over 1 million premises already have NGA coverage today:

> *"We are investing heavily in our network. We are constructing an extensive Next Generation Access fibre network, and believe the reach and quality of our network will allow us to offer highly attractive and competitive services in terms of speed, capacity, contention, connection reliability and cost efficiency. We intend to roll out our NGA fibre network to over one million premises by December 2014 and to over 1.2 million premises by June 2015. As of June 30, 2013, we have rolled out our network to more than 475,000 premises passed. On May 20th, we launched our efibre proposition offering high speed broadband of up to 70mp/s."*[67]

Eircom states that the investments required by FTTH deployment are significantly higher than those required by FTTC/FTTN roll-outs:

Figure 22 – Expected cost ranges for the different NGA technologies

As a consequence, focus has rather been put on FTTC for now but FTTH trials roll-out have been performed in the urban areas of Sandyford and Wexford since 2012. In late October 2014, Eircom announced that it would offer one gigabit Internet connectivity across 66 communities across the country. This will be achieved through FTTH connections[68].

On the 4th June 2015, Eircom announced an extension of its NGA roll-out plan to 1.9 million premises instead of the 1.6 million premises initially planned[69].

3.2.2.1.2 UPC

UPC Ireland operates the largest cable-TV network in Ireland with 853,000 homes passed and 512,000 customers (purchasing its video, broadband and telephony services)[70].

UPC Ireland operates in 5 clusters including Dublin, Cork, Galway, and Limerick. With its network, UPC can often provide AFL without purchasing any wholesale inputs as broadband internet is available for 88% and telephony services for 87% of its passed homes[70].

[66] http://www.eircomwholesale.ie/news/

[67] http://investorrelations.eircom.net/about/

[68] http://www.eircomwholesale.ie/news/

[69] http://www.eircomwholesale.ie/news/NGA_rollout_extended_to_1_9M_premises/

[70] http://www.libertyglobal.com/oo-ireland.html

Figure 23 - Areas where most dwellings are passed by UPC

NB: map constructed on the basis of the areas covered by UPC and manually mapped with Eircom's exchange areas

Source: TERA Consultants analysis of the list of areas covered by UPC (http://support.upc.ie/app/answers/detail/a_id/256/~/activation-code)

3.2.2.1.3 Vodafone/ESB

ESB and Vodafone Ireland have created a fibre broadband joint venture company named SIRO aiming at rolling out and operating a fibre-to-the-building (FTTB) network making use of ESB's existing overhead and underground infrastructure.

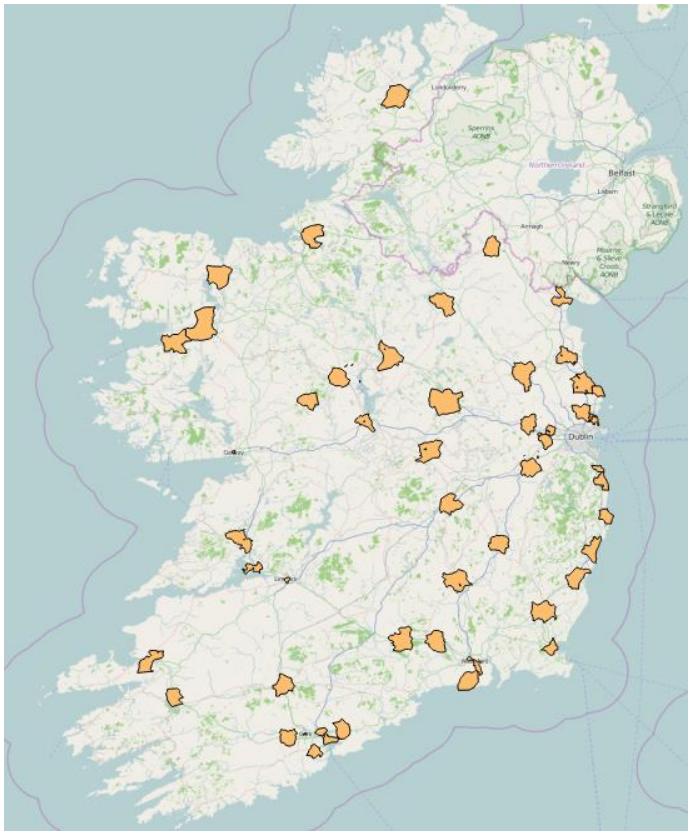
SIRO has announced[71] a €450 million investment plan to deploy a FTTB network offering speeds from 200Mbps to 1Gbps to 500,000 premises in fifty regional towns in 26 counties (see Figure 24) by the end of 2018. A second phase of the project has been announced with the aim to reach 300 smaller towns.

According to Vodafone, SIRO will operate exclusively as a wholesale player meaning that its network *"will be available to all telecoms operators in Ireland to resell to their customers".*[72]

[71] http://www.esb.ie/main/downloads/SIRO-Press-Release.pdf

[72] http://www.vodafone.com/content/index/about/about-us/policy/news-releases/siro.html

Figure 24 – 50 cities for phase 1 SIRO project



Source: TERA Consultants analysis of siro.ie/roll-out/
NB: map constructed on the basis of the towns targeted by Siro and manually mapped with Eircom's exchange areas

3.2.2.2 National Broadband Plan (NBP)

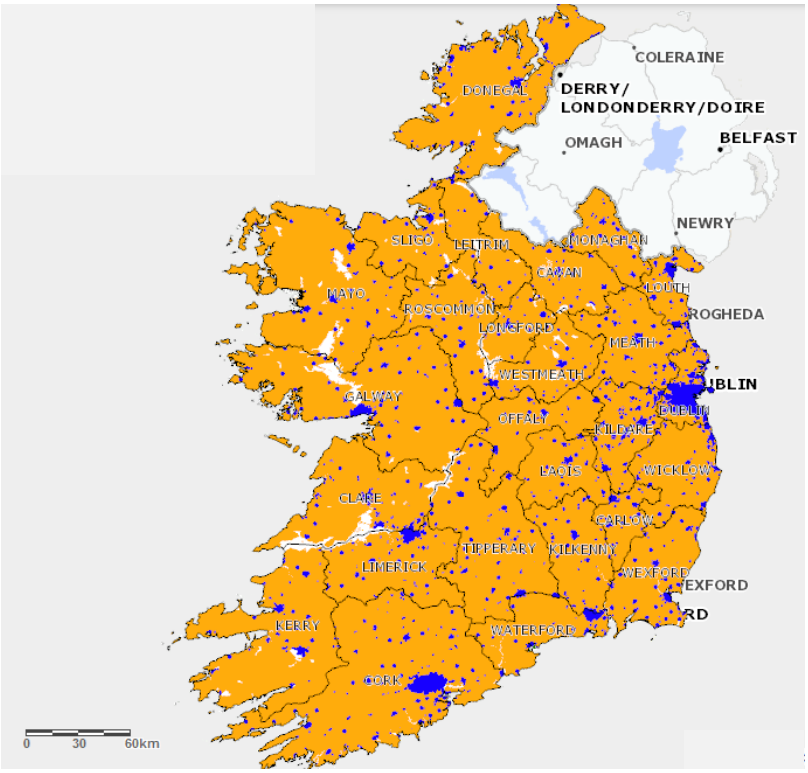
The anticipated NBP will be a State intervention or investment program aiming at fulfilling a triple target set by the digital agenda for Europe (DAE). The objectives set out in 2012 are

- 70Mbps-100Mbps to more than half the population by 2015;
- At least 40Mbps, to at least a further 20% of the population;
- A minimum 30 Mbps for every remaining home and business in the country[73].

The NBP proposes to meet DAE targets using both public and private money. State intervention would occur for a high capacity broadband network where it is unlikely that the market itself will deliver (see Figure 25). State intervention will aim to ensure that all end users have access to a high speed broadband connection in the intervention area.

[73] DCENR, Delivering a Connected Society, A National Broadband Plan for Ireland http://www.dcenr.gov.ie/nr/rdonlyres/1ea7b477-741b-4b74-a08e-6350135c32d2/0/nbp.pdf

Figure 25 –National Broadband Plan areas



Blue: areas that the commercial operators will cover by the end of 2016.

Amber: areas that will be targeted by the National Broadband Plan.

Source: http://www.broadband.gov.ie/

The timing of the NBP is not precisely known at this stage but a public consultation about Ireland's broadband intervention strategy has been launched in July 2015 in which the Government has set out its ambitions in this respect[74]. Depending on the outcome of the public procurement process, the physical build of the network could begin in late 2016. It could take 5 years to complete the network build depending on plans submitted by the successful bidder(s)[75]. In addition to the physical build there is likely to be a time horizon for customers to effectively migrate from copper to the fully completed NBP infrastructure. This is due to consumers evolving demand or competition for more innovative service offers (not forced migration). As a consequence, it is likely that the envisaged new NBP infrastructure will generate limited competitive pressure only in some areas over the next 5 years.

It is not known at this stage whether the fully completed high capacity NBP infrastructure will ensure universal services provided for in the Universal Directive; whether retail operators if relying on the NBP network would provide universal services

http://www.dcenr.gov.ie/NR/rdonlyres/6535B49B-19C1-432D-92EB-A6904A6B05E3/0/BroadbandStrategyforIreland.pdf

[75] See DCENR, Ireland's broadband intervention strategy, July 2015

(currently voice) and; whether retail prices offered would be affordable in the context of a universal service. With respect to the availability of AFL services, possibly the NBP would be able to support the provision of universal type service (e.g., 'access to a communications network' or voice service through VoIP technology). As explained by ComReg in its recent consultation about the regulatory implications of the National Broadband Plan, *"in principle a managed VOIP service over a high speed quality network could satisfy the requirements of a voice AFL USO if provided at an affordable price"*[76]. However, that does not automatically imply that retail operators relying on the NBP network will provide universal type service amongst others, voice services for example. In the context of affordability of services, while the EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks[77] provide some broad rules and indications about the level of wholesale access prices of the NBP infrastructure[78], this is not sufficient to establish whether retail prices for AFL will be affordable if delivered in the longer term over the high capacity broadband network.

3.2.2.3 Next generation mobile/wireless technologies

3.2.2.3.1 3G & Long Term Evolution (LTE)

Mobile networks are capable of providing voice and Internet access services while in motion. However, it is generally accepted currently that the substitutability between fixed and mobile offers for either voice and or broadband is not yet effective. For example, the European Commission has recently concluded that substitutability between fixed and mobile offers is limited:

> *"Although mobile networks can, to a large extent, replicate the offers from fixed networks, providing end customers with offers which are similar to fixed networks, access via the mobile network is presently not considered in general by NRAs as substitutable with access to the public network at a fixed location. While the percentage of mobile-only households is continually increasing in the Union, a majority of customers still takes both fixed and mobile subscriptions. Further, the coverage and perceived quality of calls on the mobile networks still differ geographically and over time, also affected by the number of simultaneous users in the network. These elements would seem to indicate a*

[76] ComReg 15/57, National Broadband Plan - Response to Call for Input

[77] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2013:025:0001:0026:EN:PDF

[78] *"Wholesale access pricing: Benchmarking is an important tool for ensuring that the aid granted will serve to replicate market conditions like those prevailing in other competitive broadband markets.*

Wholesale access price, should be based on the pricing principles set by the NRA and on benchmarks and should take into account the aid received by the network operator.

For the benchmark, the average published wholesale prices that prevail in other comparable, more competitive areas of the country or the Union shall be taken or, in the absence of such published prices, prices already set or approved by the NRA for the markets and services concerned. If there are no published or regulated prices available for certain wholesale access products to benchmark against, the pricing should follow the principles of cost orientation pursuant to the methodology established in accordance with the sectorial regulatory framework."

greater degree of complementarity than of substitutability between these products in most Member States at the present time."[79]

In addition to this, indoor quality of service of mobile networks can be sometimes very poor. Indeed, license obligations typically specify obligations for outdoor coverage. As a consequence, while an operator may indicate that it covers a given area, people may not be able to always have access to mobile services inside their home if they use their mobile handset[80].

However, in the context of the extension of coverage over time, the improvement of mobile technologies and mobile traffic representing an increasing proportion of the total voice traffic (see §3.1.1.1), looking forward, it is envisaged that mobile services will generate greater competitive constraint over time on AFL, and for standalone voice customers. Also mobile technologies can be used to provide fixed service (sometimes called fixed wireless) through the use of an antenna on top of houses and buildings (typical cost of antenna + installation is €300[81]). 3G and 4G provide broadband Internet access (typically 1Mbps with 3G and 10 Mbps with 4G[82]). Mobile-based technologies can in principle be considered in certain cases as efficient ways to provide AFL services i.e. a connection upon reasonable request.

Over the last few years, mobile operators have managed to reach significant 3G coverage. Following the 2012 spectrum assignment[83] in 800MHz, 900MHz and 1800MHz spectrum bands, three mobile operators acquired spectrum rights of use in the 800MHz band and four operators acquired rights in 900MHz and 1800MHz bands. It is envisaged that this new spectrum will be used to improve the quality and coverage of existing networks (thanks to low frequency spectrum bands) and to deploy new technologies such as 4G/LTE (Long Term Evolution).

NB: it is interesting to note that Irish mobile operators do not currently advertise the Internet access speeds available on their mobile network.

3.2.2.3.1.1 Eircom/Meteor

Eircom has currently a significant 3G coverage and is rolling out a next generation mobile network based on a 4G mobile technology, LTE - 4G coverage is already available in Dublin, Athlone, Carlow, Limerick, Cork and Galway.

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[79] COMMISSION STAFF WORKING DOCUMENT EXPLANATORY NOTE Accompanying the document

"Commission Recommendation - on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services", 2014

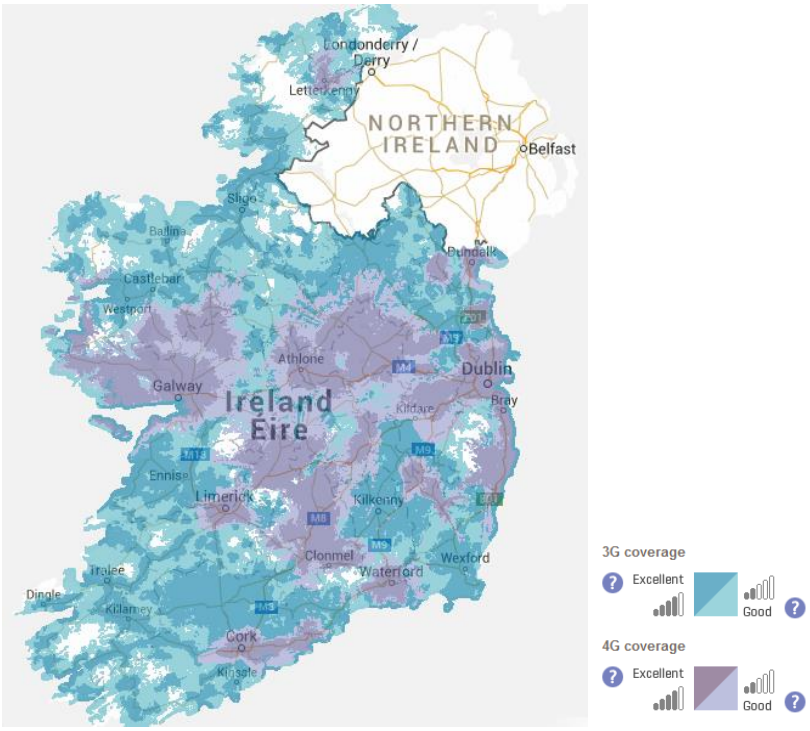
[80] See for example Vodafone website and Three website which show indoor and outdoor coverages and the difference between the two types of coverage is sometimes significant

[81] Source: TERA analysis

[82] https://switcher.ie/broadband/guides/4g-mobile-broadband/

[83] Results announced by ComReg on 15 November 2012.

Figure 26 – Eircom mobile's current 3G/4G coverage



Source: Eircom (http://www.emobile.ie/phonesplansmore/coverage/)

This network enables to cover a significant part of the population, including with mobile broadband services:

> *"We are the largest integrated telecommunications operator in Ireland, with an ubiquitous fixed line voice network, with broadband services available to approximately 96% of potential customers in our coverage area. We also have a mobile network with 2G outdoor service that covers 98.4% of the Irish population, and covers 99% of the Irish population through our network and our roaming arrangement with Vodafone. As of December 31, 2012, our 3G outdoor service covered 90% of the Irish population."*[84]

Despite this large coverage, an unneglectable part of the population and of the territory would not be covered by Eircom's 3G or 4G network.

Eircom considers[85] that the 4G technology may be used in the future to serve customers in the most remote areas where the provision of fixed line infrastructure would be complex.

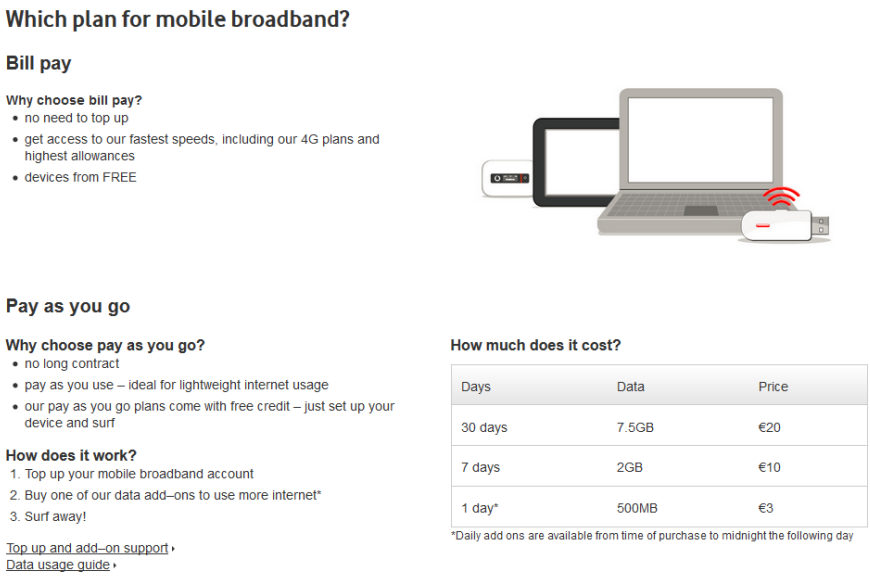
[84] http://investorrelations.eircom.net/about/

[85] See "13D Response to IR on RAT & FIA 20Nov14"

3.2.2.3.1.2 Vodafone

Vodafone offers mobile broadband plans at the retail level based on its 3G and 4G networks. Its mobile broadband network covers 90% of the population[86].

Figure 27 - Vodafone's mobile broadband plans



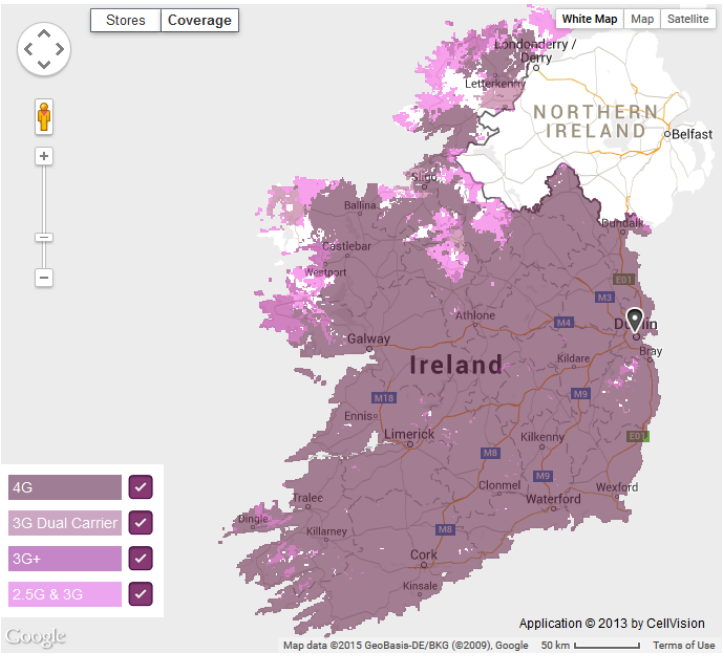
Source: Vodafone website (https://www.vodafone.ie/mobile-broadband/)

Vodafone also offers significant 4G coverage in 6 cities and more than 500 towns nationwide. According to Vodafone, its 4G network provides speeds of up to 75 Mbps[87].

[86] http://www.vodafone.ie/coverage/mobile-broadband/

[87] http://www.vodafone.ie/network/4g/

Figure 28 - Vodafone mobile current 3G/4G coverage

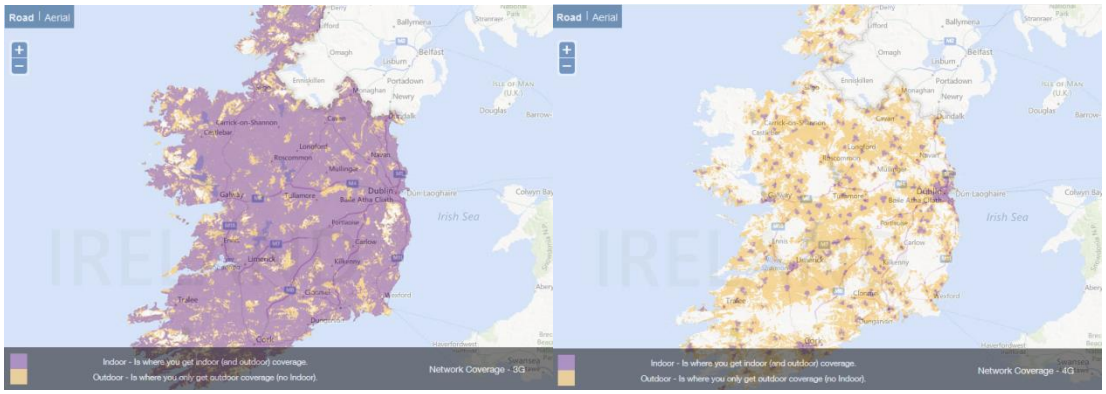


Source : http://www.vodafone.ie/coverage/

3.2.2.3.1.3 Three/O2

Following their merger with O2, Three have reached significant 3G coverages and have started to roll out a 4G network with focus on main cities. Three indicates that its 3G network covers 96% of the population[88].

Figure 29 - Three current 3G/4G coverage



Source: http://www.three.ie/explore/coverage-checker/

3.2.2.3.2 The National Broadband Scheme

Following the conclusion of a competitive tendering process, Three was selected in late 2008 to operate the National Broadband Scheme (NBS). The objective of the NBS was

[88] http://www.three.ie/eshop/broadband-plans/prepay-broadband/

not to fulfil AFL USO but to deliver basic, affordable broadband (with a minimum download speed of 1.6Mbps) to certain target areas in Ireland (around 235,000 premises) in which broadband services were deemed to be insufficient. This scheme was complemented by the Rural Broadband Scheme[89].

The NBS ended in August 2014 and therefore Three is no longer required to make available the NBS retail and wholesale services at affordable prices but coverage will continue to be available on a commercial basis.

Thanks to the NBS, broadband should in theory be available to 99% of the population of Ireland.

3.2.2.3.3 Fixed wireless technologies

IEEE 802.16 is an air interface standard for Broadband Wireless Access (BWA). It supports fixed, nomadic and mobile systems, and it enables combined fixed and mobile operation in licensed frequency bands below 6 GHz.

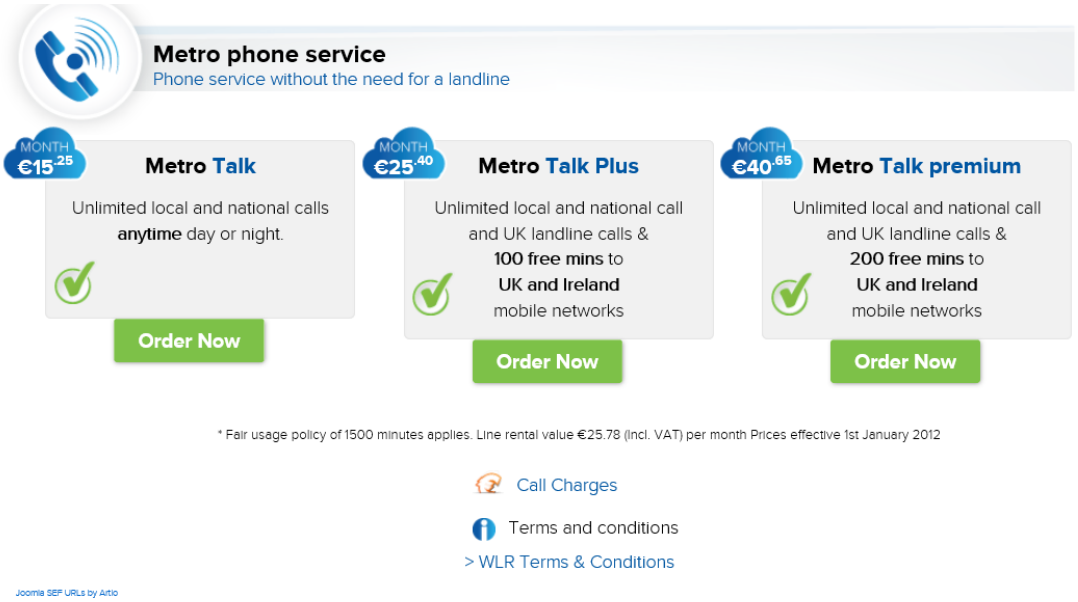
In Ireland, Digiweb and Imagine are the main providers of BWA. They both provide fixed voice services.

Figure 30 – Imagine main voice and broadband offer

Source:Imagine website

[89] http://www.dcenr.gov.ie/Communications/Communications+Development/Rural+Broadband+Scheme/

Figure 31 – Digiweb's fixed wireless voice offer



Source: Digiweb website

These networks have therefore the capabilities to provide AFL. However, the coverage of these fixed wireless networks is not precisely known. Also, in ComReg's document 14/26, ComReg stated *"Since then, Imagine and Digiweb began offering RFTS as an 'add-on' to their retail broadband service. However, since 2007, demand for broadband and other services provided over FWA networks has fallen significantly and as at Q3 2013 stood at 61,975 subscribers, having declined by 3% since Q3 2012. As a platform for the potential delivery of RFTS, FWA therefore appears to be in decline".* Also, the market survey undertaken by The Research Perspective[90] in 2012 for ComReg indicated that only 4% of fixed voice telephony lines are provided over a fixed wireless technology.

Several similar offers are available abroad. In Portugal, for instance, BWA-based service offers have been introduced in the market since 2007 such as "Optimus Home", "Homephone" and "Casa T-fixed" provided respectively by Optimus (now NOS), Vodafone Portugal and TMN. These offers allow the reuse of GSM/UMTS radio frequencies to provide voice and internet communication services at a fixed location. The availability of the service is restricted to a specific coverage area called "home-zone". In practice, the "home-zone" concept area is contingent on the customer's address and restricted to the coverage of a single Base Station (BS)[91]. In Romania, a

[90] ComReg, Market Review, "Retail Access to the Public Telephone Network at a Fixed Location for Residential and Non Residential Customers", Ref. 12/117a, 10/2012.

[91] Up to two or even three BSs can be associated to a given home-zone if justified by considerations relating to terrain topography and technical requirements of cellular planning.

similar concept is implemented by mobile operators, to deliver AFL service (including voice, Internet access and facsimile communications) through wireless technologies.

Examples of "Homezone" plans are listed hereafter:

Figure 32 - Benchmark of "Homezone" offers

Country	Operator	Name of Service	Monthly Fee (USD)	Content of offer
Belgium	Mobistar	Always at home	9.90	40 hours free calls to fixed lines
France	SFR	Happy zone	14.00	Unlimited calls to fixed lines
Germany	T-Mobile	T-Mobile@Home Single Centre	7.00	In the 2km distance of any location designated as home calls to landline USD 0.05
	Vodafone	At home flat rate	21.22	Free calls to national landline and to Vodafone
Greece	Cosmote	At home 500	12.70	500mn per month calls to national landline
		At home international	19.13	300mn per month calls to national landline and international fixed networks of several countries
Korea	SK Telecom	T-zone	1.82	Fixed calls at the same rate as fixed operators in the zone
New Zealand	Vodafone NZ	Local Plan	16.41	Unlimited calls to local fixed lines
Spain	Mobistar	Movil en casa	8.49	500mn per month calls to national landline
	Vodafone	En tu casa	21.22	Unlimited calls to national fixed lines
UK	O2	Favorite place	16.12	500mn per month calls to national UK landline and to O2 mobiles from a given postcode.

Source: OECD based on operators websites

"Homezone" like solutions have already been offered in Ireland although for business users only, for example by Vodafone:

> *"Vodafone also launched a service branded as 'One Net Express' in 2012 which is a telephone service that is provided directly by Vodafone over its mobile network, but with a geographic telephone number associated with a fixed location. This highlights the possibility for a MSP to use non-wired or wireless-based network inputs to also provide RFTS services. This One Net Express product is targeted at business customers and enables incoming calls made to the businesses' geographic telephone numbers (which are usually associated with a fixed telephone) to be received on employees' mobile telephones. The*

One Net Express product is marketed by Vodafone as an integrated fixed and mobile voice communications solution."[92]

3.2.3 Conclusion on infrastructure trends (supply side)

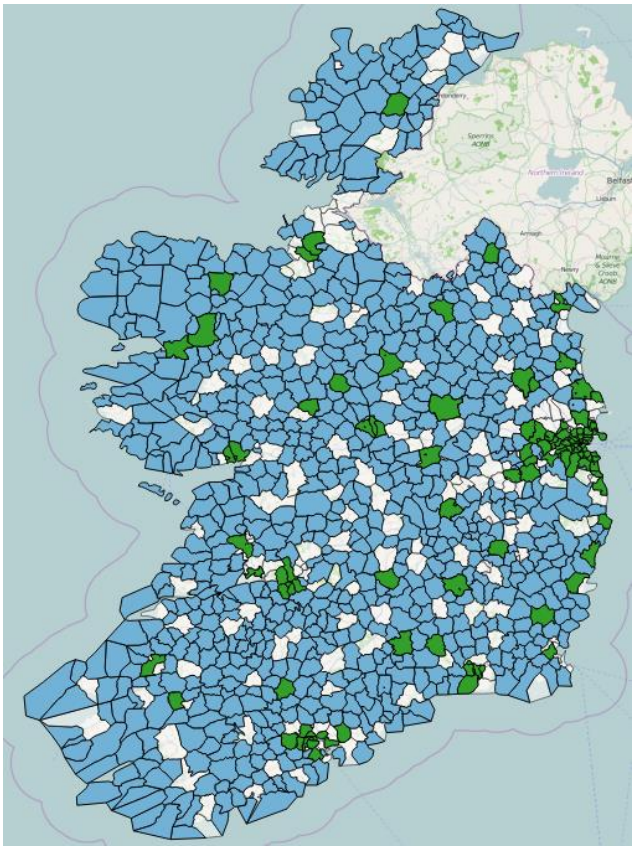
- Several types of infrastructures have the capabilities to provide AFL:
  - Fixed wired infrastructure:
    - Eircom's legacy infrastructure;
    - Eircom's NGA infrastructure;
    - UPC infrastructure;
    - SIRO infrastructure;
    - The NBP network;
  - Wireless infrastructure providing AFL:
    - 3G and 4G Mobile networks (complemented with solutions to provide indoor coverage), GSM and FCS being excluded as it is unable to provide FIA;
    - BWA/Wimax networks;
    - Other wireless networks such as Rurtel
- These infrastructures have different coverage; the competitive constraints with respect to AFL are likely heterogeneous across the country. In particular, wireless technologies are mainly used for mobile usage and are rarely used to provide AFL. 3G and 4G technologies achieve significant but not full coverage of the country but this significant coverage is an outdoor coverage not an indoor coverage. However, it is envisaged that over time mobile technologies will likely generate greater competitive constraint on AFL, where mobile voice services may become increasingly substitutable with fixed voice services. It is noted that to provide AFL, wireless technologies require the development of specific commercial offers which include the installation of a roof-top antenna (to benefit from the outdoor coverage). Such types of commercial offers are not currently available on any significant scale in Ireland.
- For the purposes of TERA's assessment, broadly three main areas can be identified (see map and table below):
  - Areas where Eircom faces greater market-driven infrastructure-based competition including, from Vodafone/ESB/Siro or UPC (referred to in the rest of the report "market-driven infrastructure based competition areas");
  - The anticipated NBP intervention area where a high capacity broadband access network would be made available through Government subsidies (referred to "NBP areas" in the rest of the report). Over the next 5 years, the NBP network may not be fully completed. As a consequence, in the immediate future the NBP infrastructure may not be available to secure

[92] ComReg 1426, "Market Review - Fixed Voice Call Origination (FVCO) and Transit Markets"

AFL US, especially when taking into account the time for customers to migrate. Also, it is not yet certain that affordable US AFL offers would be delivered on the basis of this new network and made available on the retail market. This means also that over the next 5 years, the NBP may not generate sufficient competitive constraints on existing networks for the provision of AFL. The market dynamic in NBP areas would therefore likely to be similar to "Eircom only" areas over the next 5 years. Despite this assumption, Eircom only areas and NBP areas are analysed separately in the rest of the report. The identity of the NBP provider (or providers) is not known at this stage.

- Areas where Eircom faces no competition from any fixed infrastructure but could face competition from mobile networks providing fixed access solutions ("Eircom only" areas), especially looking forward. In these areas, it is envisaged that Eircom will further deploy an NGA network providing high speed broadband to the population;
- It is important to note that these 3 areas are defined in the specific context of USO - by looking at the potential competitive constraints, amongst other things, demand and supply side developments, on the delivery of universal service, primarily of voice AFL. This AFL USO analysis is therefore different from the analysis aimed at defining the Large Exchange Areas (LEA) as set out in ComReg Document N°13/14 in the context of the obligation not to unreasonably bundle imposed on Eircom in the Retail Fixed Narrowband Access Markets (the geographic footprint as defined by the LEA has also been used in the specific context of the implementation of a margin squeeze test in the Wholesale Broadband Access Market). The LEA is defined on the basis of 5 criteria in which the presence of LLU or NGA in a given area is an important consideration. However, in the context of AFL USO, the presence of LLU and of NGA is less relevant as LLU and NGA are not primarily used for the provision of standalone voice services. As a consequence, the definition of LEA has not been considered further in this analysis.

Figure 33 - 3 different competitive environments – location and number of Eircom lines



Area	Legend	Active PSTN lines	%
Market driven infrastructure-based competition (Vodafone/ESB, UPC)		590k - 720k	45% - 55%
NBP		330k - 460k	25% - 35%
Eircom Only		195k - 330k	15% - 25%
	TOTAL	**1,310k**	

NB: Once the 3 areas have been manually mapped to Eircom exchanges based on publicly available data (see above), the information is merged with the number of active PSTN lines within each area (source: excel file "Geocible data 2014", sheet "Master exchange data", column K). Due to the lack of precision of the approach (in reality, not all lines within an exchange area would be in just one of the 3 areas + manual mapping is not precise), a 10% range is set instead of a unique figure.

Source: TERA Consultants analysis

The map and table above provide a high level view of the coverage of the different network infrastructures in place in Ireland. Detailed maps of the coverage of each network infrastructure were not available to TERA Consultants. As a consequence, it was necessary to use publicly available maps (such as the ones copied in this report)

or publicly available information about cities covered[93] and match them with Eircom's exchange areas to be able to determine which areas were currently covered by a particular infrastructure. This analysis could be improved through the use of shapefiles representing the coverage of each infrastructure. However, for the purposes of this report, the assessment conducted here are sufficient. In order to determine the likely future evolution of the boundaries of these areas, anticipated future roll-outs (NBP, NGA…) have been considered to the extent that information is available about the location of these rollouts.

[93] http://support.upc.ie/app/answers/detail/a_id/256/~/activation-code

4 What if AFL USOs are ceased?

4.1 Objectives

ComReg aims at designing USOs in order to ensure access to services that would not be provided in normal market conditions. When reviewing the scope of AFL USOs and potentially envisaging lightened obligations, a key step is to define the likely scenarios over the next 5 years in absence of any AFL USO.

To understand the importance of AFL USO, it is necessary to understand what would happen if AFL USOs were ceased. This hypothetical counterfactual scenario should enable better understanding of the importance of AFL USOs or otherwise looking forward. Because Eircom continues to be designated as USP until 31 December 2015, the analysis of this scenario is focused on Eircom and on how Eircom could behave absent any AFL USO.

It is important to note that the objective is not to determine how Eircom would most likely behave. The objective is to assess how Eircom could behave in rather extreme situations (such as extreme competition in urban areas for example) assuming Eircom is behaving as a profit-maximising entity. The analysed scenario can therefore be described as a "worst case but possible scenario" and is not necessarily representative of Eircom's current behaviour.

The objective is to assess whether absent any AFL USO and left to the operation of market forces alone, basic services required by the Universal Service Directive may not be provided to everyone or may not be provided at affordable price or with an acceptable level of QoS.

Each element of AFL USO is analysed separately in this section. §5 will consider these analyses in aggregate to elaborate recommendations.

4.2 Approach followed

In this section, the analyses are geographically differentiated to take into consideration the different competitive pressures in respect of voice in the different areas within Ireland. Indeed, a profit-maximising operator would not necessarily behave in the same way in areas where it faces strong competition and in areas where competition is low. In accordance with § 3.2.3, 3 different areas are considered:

- **Market-driven infrastructure-based competition areas** (from SIRO or UPC), where Eircom is likely to adapt its behaviour to be able to compete with other infrastructures;
- **NBP areas** where a high capacity broadband access network is envisaged to become available through Government subsidies;
- **"Eircom only" areas where Eircom faces no competition from any fixed infrastructure networks** providing AFL (though faces competition from

resellers) and where Eircom may decide for example to limit its expenditures and increase its prices to optimise its profits. Competition from wireless infrastructures may mitigate this risk, especially looking forward.

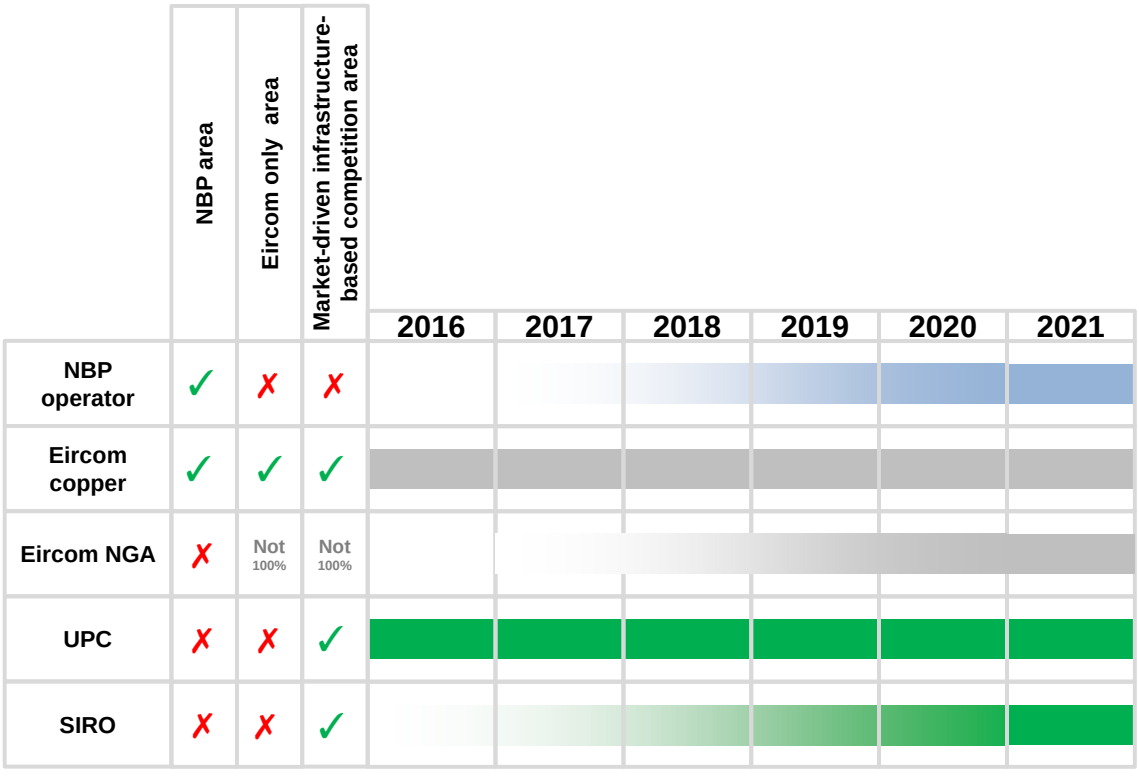
Time factor needs also to be considered as the deployment of competing infrastructure able to support AFL is on-going (see Figure 34).

- SIRO is currently at an early stage of deployment:

  "Construction will commence early in the new year and phase one is expected to be fully rolled-out by the end of 2018, with further scope for a second phase thereafter."[94]

- The build of the National Broadband Plan is likely to take between 3-5 years once the procurement process is complete and; depending on any plans submitted by the successful bidder(s). It is expected that the physical build of the network could begin in late 2016.

Figure 34 - Potential deployment calendar for the different fixed access platforms



Source: TERA Consultants

As USOs aim at ensuring the provision of the right of end-users to benefit from basic electronic communications services "from now" and not only "in the long run", NBP areas and "Eircom only" areas can mostly be considered in aggregate for the purpose of this particular analysis. As explained in §3.2.2.2, the NBP network would possibly

[94] http://siro.ie/50-irish-towns-to-receive-world-leading-broadbandspeeds/

not be fully deployed over the next 3 to 5 years and will therefore exert limited competition pressures for the provision of AFL in this period, in the context of AFL, it is possible to characterise NBP areas as broadly similar to Eircom only areas over the next 5 years. They are however treated separately in this report (this is for example useful for the analysis of the RAT).

Also, it can be considered in principle that when the deployment of a competitor infrastructure is anticipated in a given area, Eircom is likely to react in advance of this entry and to act as if it was already available. The situation is different with respect to the NBP areas as the perspective NBP supplier has not yet been selected with the procurement process yet to commence. When the supplier for the NBP will be selected, two scenarios could be envisaged:

- If Eircom wins the NBP bid, absent any AFL USO, Eircom may decide to limit its expenses in its legacy network or increase its prices in these areas to facilitate more rapid migration from copper to NGA and improve the profitability of the NBP related investment. Indeed, such a strategy could subject to any regulatory requirement minimise the need of having two infrastructures running in parallel and could therefore generate cost savings (preventative maintenance, re-investments, etc.). Alternatively Eircom could wish to keep customers connected to its legacy network (which additionally applies with a sufficient level of QoS and affordable prices, otherwise, these customers could stop having a fixed wired connection). This scenario would be unlikely if the NBP contract between DCENR and the winner of the bid imposes on the winner strict timelines to deploy the network in a given area or, to connect any customer requesting access or, if the connection costs are subsidised[95] making the behaviour of the winner indifferent to the fact that a customer is costly to connect or not.
- If Eircom loses, it is likely that, even absent AFL USO, in order to compete as long as possible with the NBP supplier and make sure the existing copper network provides incremental revenues as long as possible and recovers the investment incurred several years ago (sunk costs) that it would be forced to maintain and/or improve its existing AFL services. Alternatively, it may decide not to actively compete in that area — however, due to the sunk nature of its investment the incremental cost faced by Eircom to continue to compete in that area would be low.

To assess the impact of ceased USOs for the different AFL USO components, the following questions are addressed in the following sections:

- What if a service connection on reasonable request obligation is removed? (see §4.3)

[95] For example, in France, as part of the NBP, any cost of connection above €250 is subsidised, meaning that operators do not pay more than €250 for a connection (http://www.francethd.fr/wp-content/uploads/2015/05/Cahier-des-charges-PFTHD-2015.pdf page 19)

- What if the FIA minimum speed obligation is removed? (see §4.4)
- What if affordability inter alia GAP USOs are removed? (see §4.5)
- What if terms and conditions USOs are removed? (see §4.6)
- What if QoS USOs are removed? (see §4.7)

4.3 All reasonable requests for connection at a fixed location to a public communications network must be met

According to the Universal Service Directive, all reasonable requests for connection at a fixed location to a public communications network shall be met. It is however up to each Member State to define what a reasonable request is.

In the context of Ireland, removing AFL USO where reasonable access is concerned would mean that the €7,000 threshold for reasonable request is essentially set to zero, and the requirement to meet a reasonable request would no longer be in place. In other words, Eircom would be able to choose whether a given request would be addressed or not (or whether the connection costs would be passed to the end-user if these are considered as too expensive). In this case, Eircom, acting as a profit-maximising operator, will likely try to maximise its profits by comparing the cost of connecting a customer to its estimated future revenues before making a decision on each request.

The period over which Eircom can expect future revenues depends on the competitive pressure of the different areas:

- In **market-driven infrastructure-based competition areas**, consumers are more accustomed to move from one supplier to another and the expected customer lifetime is **circa 4 years[96].** However, Eircom could be expected to generate revenues from its fixed line over a longer period of time since consumers can switch to another supplier of traditional fixed line phone service which is delivered on the basis of SB-WLR, in which case, Eircom would get SB-WLR revenues. According to data summarised in Table 6, on average 14% of the churners from Eircom retail would subscribe with a traditional supplier (probably relying on SB-WLR). This means that the average lifetime for Eircom retail + wholesale service is slightly greater than 4 years;
- In **NBP areas**, Eircom can expect future revenues from a new connection as long as customers do not churn to the NBP network. The period of time over which Eircom can expect future revenues therefore depends on when the NBP network will be deployed and when customers will migrate to the NBP. This could be estimated at minimum **4 years** (see §3.2.2.2). Indeed, if the NBP network is deployed within the next 4 years and customers start migrating, then

[96] 110610_USO_eircom_Response - 13D request.pdf

Eircom cannot expect generating revenues over 20 years but over a much more limited period of time (minimum 4 years).;

- **In "Eircom only" areas where Eircom faces no competition** from any fixed infrastructure networks, a maximum **20 years** period can be considered according to Eircom (the impact of selecting 15 or 20 is small):

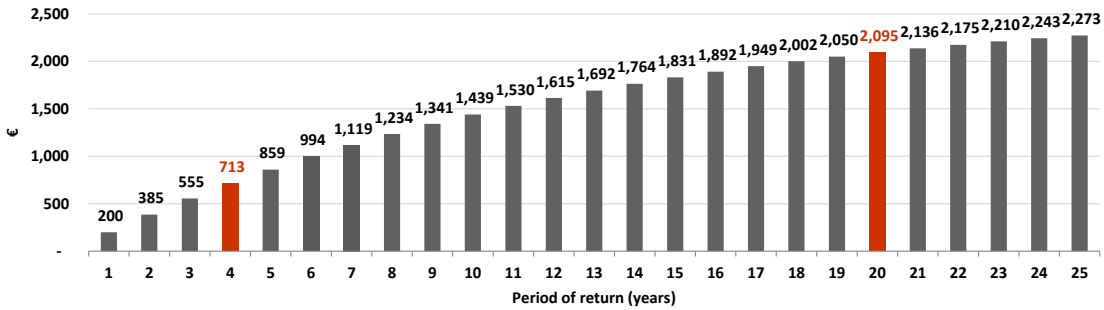
  "Eircom has highlighted in previous submissions that it considers the RAT at €7,000 to be unreasonable relative to the potential return Eircom could earn on that investment over a reasonable period such as 20 years. Eircom is not of the view that the RAT should be increase. It is Eircom's view that the RAT should be decreased."[97]

The expected net revenues from AFL can be estimated on the basis of the monthly price of SB-WLR, €18.02 per month VAT excluded (or €16.50 VAT excluded per ComReg's preliminary view that SB-WLR should be cost-oriented)[98]. SB-WLR is used as a proxy to estimate net revenues (excluding connection cost) because most of the costs recovered by SB-WLR are fixed costs (network costs) and because retail costs are assumed to be variable costs. Figure 35 and Figure 36 show the sum of discounted revenues expected depending on the period of return:

[97] Source: Response to IR on RAT & FIA 20Nov14

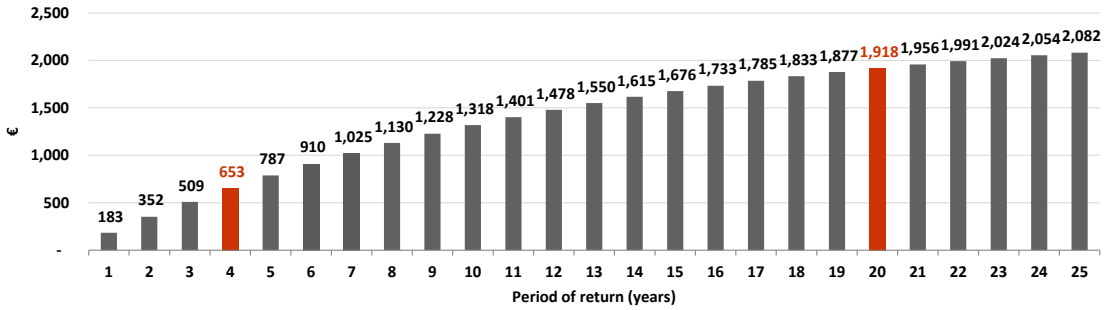
[98] However, it should be noted that this is a consultation view only and is subject to a final decision.

Figure 35 - Sum of discounted revenues during the expected period of return (SB-WLR at €18.02/line/month)



Source: TERA Consultants analysis

Figure 36 - Sum of discounted revenues during the expected period of return (SB-WLR €16.50)



Source: TERA Consultants analysis

This analysis of the expected anticipated revenues shows that the profitability threshold is likely to be between €700 (market-driven infrastructure-based competition areas, NBP) and around €2,000 (areas where Eircom faces no infrastructure-based competition from a wired network) depending on the competition environment. In other words, in NBP and market-driven fixed network competition areas Eircom may decide not to connect a customer if its connection cost is greater than €700. However, this choice would be mitigated by the fact that if Eircom does not connect this customer, Eircom would lose the opportunity to sell further products to this customer (in addition to the line rental, such as calls, broadband, etc.). In Eircom only areas, Eircom may decide not to connect a customer if its connection cost is greater than €2,000.

Among the ✂connections that were requested during FY2013/14, ✂ were in-situ connections that are normally electronically enabled (corresponding costs are below ✂). Remaining ✂ connections were new connections that cost from ✂ up to several thousand euros (see Figure 37). In FY 2013/14, ✂ connections were performed at a cost greater than €500 and ✂ connections at a cost greater than €1,000. These numbers were similar in FY 2012/2013.

Figure 37 – Number of connections to the network by cost range (FY2012/13 & FY2013/14)

Even in the "greater than €500" connection cost range, the vast majority of connections are completed by Eircom as a USP with a copper path. The use of FCS solution remains very limited.

Figure 38 – Technology used for connection to the network by cost range (FY 2013/14)

As a consequence, in the worst case scenario, if AFL USOs are ceased, ✂ new connections[99] (✂%) may not be provided by Eircom if the value of €700 is used as a threshold by Eircom[100]. This represents ✂ customers over 5 years. This number would fall to ✂ if the value of €2,000 was considered.

A certain proportion (maximum 96%, see §3.2.2.3.1.1) of these users could in theory be connected through 3G or 4G wireless technologies providing AFL but ✂ customers would remain unserved and therefore universal service would not be provided. This is however assuming that offers are available[101] to provide AFL on the basis of 3G-4G technologies which is currently not the case in Ireland. FCS could also be used but FCS does not support FIA (see §3.2.1).

Considering the reasonable threshold defined in other countries (between €1,900 and €5,000, see annex §7.2), there is a risk that several reasonable requests for connection at a fixed location would not be met. This means that there is a risk that the requirements of the Universal Service Directive/Universal Service Regulations would not be met in Ireland.

4.4 AFL must be capable of supporting voice (originating and receiving national and international call), facsimile and a Functional Internet Access

Following the Universal Service Directive, USOs must ensure AFL is capable of supporting voice (originating and receiving national and international calls), facsimile

[99] In FY 2012/13 & FY 2013/14, there are ✂ connections over €1,001 and ✂ connections in the €501-€1,001 range. As a consequence, it can be assumed that ✂ + 3/5 x ✂ = ✂ connections (out of ✂) are over €700. This represents on average ✂ connections per year (✂% of total connections).

[100] This analysis considers new connections to the network only, existing uneconomic lines (those which are already connected) are addressed below in section 4.4.

[101] Assuming product development costs for a fixed wireless products are sufficiently low.

and a FIA. It is up to each Member State to define what FIA is (e.g. in terms of speed floor).

Outside those customers that may not be connected absent any AFL USO (see §4.3), it is very likely that in any event, customers already connected to the USP network would have AFL capable of supporting voice (originating and receiving national and international call) and facsimile because voice and facsimile core platforms already exist. The same applies to FIA because most of Internet subscriptions are provided over broadband or narrowband access and Eircom's narrowband/dial-up Internet core platform already exists. Therefore, Eircom is likely to maintain this core platform over the next 5 years. It is noted that Eircom currently provides 28.8 kbps to more than 94% of installed telephone lines (✂ of lines in 2011, ✂ at least today). As explained in §3.2.2, if demand migrates to new platforms (such as Eircom's NGA platform or the NBP network), voice, facsimile and Internet access will still be available (voice will be provided through the managed VoIP technology which has the potential to secure the provision of voice AFL USOs).

However, absent any AFL USO, while Eircom is likely to maintain its voice, facsimile and dial-up Internet core platforms, it is also likely that Eircom would not use its copper access network in some areas because the copper access network could be too expensive to maintain (for example because the occurrence of many faults, see §4.7).

Typically, in such cases, Eircom may prefer to use the FCS technology (see §3.2.1). FCS not being capable to support FIA (see §3.2.1), some customers would not be able to get FIA anymore which would mean that the requirements of the Universal Service Directive would not be met in Ireland.

It is difficult to assess how many customers would not get FIA anymore since it depends on the incremental costs and incremental revenues generated by each customers or group of customers. However, this number could be substantial if it is considered that unprofitable customers as measured by Eircom in its USF net cost model are a good proxy for these customers. If customers are indeed considered as unprofitable by Eircom, it is likely that these would be served by cheaper technologies such as FCS absent any AFL USO. In Eircom's USF model, around ✂ customers have been identified as unprofitable.

These customers could however be able to get FIA through alternative infrastructures:

- UPC and SIRO but their coverage is limited,
- The NBP network but the NBP may not be fully rolled out over the next 5 years,
- 3G and 4G networks but 4% of the population remains uncovered and there are no offers available on the market providing AFL through wireless networks,
- The NBS, but this scheme has ended and therefore prices may be unaffordable or coverage incomplete since the end of the scheme,
- Satellite but satellite could raise affordability issues[102].

[102] First year cost is always above €600 (https://switcher.ie/broadband/compare/satellite-broadband/)

As a consequence, absent any AFL USO, it is possible that ✂ customers[103] (Eircom's estimated unprofitable customers) would be connected on the basis of alternative technologies. The risk is that such alternative technologies would not be able to provide FIA (like FCS). Or that they offer an incomplete coverage (3G or 4G). There is a risk that some customers would therefore remain without FIA which is inconsistent with the requirements of the Universal Service Directive/Universal Service Regulations.

Also, as noted in § 3.1.3, the current specification of FIA in Ireland does not allow the use of basic Internet functionalities.

4.5 AFL prices must be affordable / Member states can impose geographically averaged prices

4.5.1 Reminder of the context

According to the Universal Service Directive, each Member State may impose the following AFL USOs if required:

- Have USP to provide consumers tariff options or packages which depart from those provided under normal commercial conditions;
- Set an AFL price cap;
- Impose that AFL prices are geographically averaged.

A retail price control amongst others, a price cap mechanism is imposed on retail line rental. The retail price cap which relates to consumer's standalone fixed voice access services i.e. line rental and connection fees (excluding voice calls) does not allow Eircom to increase the retail line rental price more than the rate of inflation (i.e. CPI-0). This obligation has not been imposed in the context of AFL USO. As a consequence, the possibility to cease the existing price cap obligation will not be studied in the context of the AFL USO scope review.

ComReg has also imposed on the USP that AFL prices shall be geographically averaged. The aim of this section is to assess the consequences of ceasing with this GAP obligation. To do so, potential constraints on Eircom and the retail line rental price are first analysed (see §4.5.2) before assessing the possible impact of ceasing the GAP USO (see §4.5.3).

4.5.2 Constraints on the retail line rental price

In order to assess the impact of ceasing AFL USO, it is important to note that Eircom's ability to increase prices is to some extent constrained:

[103] It is observed that this figure is stable over the years according to the USF model.

- Considering customers' price sensitivity (see §3.1.2.2), it may be the case that Eircom could have greater financial incentives to maintain the retail line rental price at current levels rather than to increase this price. This is because revenues potentially lost from the proportion of customers reporting that they would likely cancel their fixed line subscription in the context of a significant price rise (indicating a price-sensitivity) could outweigh any revenues generated by a significant increase in price. In summary, Eircom may be constrained by customers' price sensitivity. However, despite the fact that §3.1.2.2 provides some figures, the analysis of whether Eircom would have greater incentives to maintain the retail line rental price at current levels rather than to increase this price, cannot be conducted precisely: for example, in most remote areas, people may have less choice to effectively switch to another supplier and therefore may be less likely to be willing or able to switch. In areas with a low level of infrastructure-based competition, the percentage of customers that could cancel their fixed line subscription may be lower. As a consequence, it cannot be excluded (but impossible to check as no data on price sensitivity is available per geographic areas[104]) that Eircom would have incentives to increase the retail line rental in some areas or for particular sets of end users.
- As explained above, Eircom being subject to a RPC cannot increase the retail line rental price by more than the CPI in a given year. It is to be noted that since 2007, Eircom has not used the possibility offered by the price cap mechanism to increase the retail line rental in line with the CPI in a given year. This has been highlighted by ComReg in its review of the Retail Fixed Voice Access Market:

  > *"Prices for fixed voice access services have not increased since the last retail price cap was imposed. Eircom highlight that under the existing RPC a price increase of 5% would have been possible in 2008 and a further increase would be possible from October 2012. Competitive constraints are such that, Eircom contends, any such increase would be unprofitable. Eircom submits that the constraints imposed by the USO (national prices, and need to ensure affordability) would prevent any excessive pricing even if the competitive constraint did not do so."*[105]

- ComReg's document 14/89 indicates that Eircom is relatively more constrained for voice sold in a bundle than for voice sold on a standalone basis. However, in general Eircom is currently insufficiently constrained for standalone fixed voice access services nationally, competition from operators acting as resellers on the basis of SB-WLR being more limited.
- Eircom has the obligation to provide a wholesale line rental offer (SB-WLR). This offer is purchased nationally by alternative operators. ComReg recently

[104] Also data on call and line rental margin would be needed

[105] http://www.comreg.ie/_fileupload/publications/ComReg1489.pdf

entered into a consultation process on the Review of the Pricing of Regulated Wholesale Access Services[106]. ComReg is proposing to impose cost oriented SB-WLR prices (instead of retail-minus) as well as an obligation 'not to cause a margin squeeze' between SB-WLR and the retail line rental. In practice, if the latter proposal is applied, this would probably imply a decrease of SB-WLR from €18.02 per month to €16-17. By increasing economic space between SB-WLR and retail line rental, this would give alternative operators more room to compete with Eircom in respect of the voice service.

- To the best of our knowledge, UPC does not propose any standalone AFL offers. Its voices services are bundled primarily with broadband and other services such as TV. As a consequence, UPC does not exert a direct constraint on Eircom for the provision of AFL services purchased outside a bundle. However, UPC in its footprint area competes with Eircom for the provision of bundles which include voice services. Also, UPC may seek to offer standalone FVA services in the future when considering the increasing use of managed VoIP services in Ireland (see §3.1.1.3). This has been underlined by ComReg in its Retail Fixed Voice Access Market:

  > *"Regarding Eircom's ability to price independently, Eircom suggests that the product types and quality available to the market are different in UPC areas and rural areas and it responds differently depending on UPC's presence. Eircom's application of the SB-WLR discount only to bundles implies (according to Eircom) that the more intense competitive conditions relate specifically to the provision of retail bundles including FVA and that Eircom's ability to price independently in the relevant Bundled LLVA Market is more limited than in the relevant Standalone LLVA Market."*[107]

  Competitors can also potentially offer AFL services based on VoIP purchasing ULMP. The competitive pressure in market-driven infrastructure-based competition areas has led Eircom to offer a WLR discount for certain NGA bundles on a promotional basis. However, despite the presence of UPC's competing infrastructures, Eircom subsequently withdrew these temporary promotions which were allowing it to potentially decrease retail prices[108]. This could tend to suggest that competitive constraints are not strong enough to prevent Eircom from increasing its prices since, as observed by ComReg below, Eircom did not decrease its prices to the extent it could have:

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[106] Eircom's Wholesale Access Services:

Further specification and amendment of price control obligations in Market 4 and Market 5 and further specification of price control obligation in Market 2 http://www.comreg.ie/publications/consultation_on_current_generation_wholesale_access_services.583.104879.p.html

[107] http://www.comreg.ie/_fileupload/publications/ComReg1489.pdf

[108] If wholesale prices (such as SB-WLR price) decrease, Eircom can more easily pass margin squeeze tests and can lower its retail prices

> *"However, Eircom has recently announced the withdrawal of this wholesale promotion. Further, as set out at paragraphs 4.94, Table 2 the headline prices of Eircom's (non NGA) bundles including an FVA component have remained broadly constant over time for the same product categories. Despite Eircom's declining market share, Eircom had not responded to UPC's offers by reducing its prices to the extent it could have within the boundaries of regulatory price controls. Indeed as noted at paragraph 4.191 Eircom has increased the headline and/or effective price for certain retail bundles that include FVA and NGB broadband within the LEA. ComReg notes that Vodafone considers that Eircom's offer of a WLR discount is specifically designed to support the launch of a specific bundled broadband product and it is not a competitive response to the provision of FVA over cable. Otherwise, it is Vodafone's view the FVA discount would be made available on Eircom current bundles. According to Vodafone whatever constraint Eircom faces is on the broadband side."*[109]

Despite some competitive constraint on Eircom, it is noted that Sky, UPC and Eircom all have recently increased their prices (except the line rental)[110].

- Outside market-driven infrastructure-based competition areas, competitive constraints from fixed wired infrastructure are inexistent. However, wireless technologies can generate constraints on the line rental price despite the lower level of substitutability between fixed and mobile services. Looking forward, constraints on fixed telephony services generated by wireless technologies are likely to increase (thanks to coverage extension, QoS improvements, development of fixed wireless technologies addressing indoor coverage issue, etc.). The NBP high capacity broadband network is envisaged to exert competitive pressures in the long term once fully completed but not in the short to medium term. In any case, it is not known yet whether voice retail services could or would be provided over the NBP network and whether prices will be affordable in respect of universal service.

In principle, both customers' price sensitivity and competition can combine to somewhat constrain Eircom's ability to increase its retail line rental price. However, outside market-driven infrastructure-based competition areas where take up or availability of bundled offers are relatively less, competitive constraint on the line rental from bundles offers are lower. In this respect, customers can only move to the NBP network (which is not likely to be fully available in the next 5 years and for which it is not yet known whether AFL will be available and prices affordable), to mobile and fixed

[109] http://www.comreg.ie/_fileupload/publications/ComReg1489.pdf

[110] https://switcher.ie/broadband/news/eircom-announce-price-increase-from-april-2015/

wireless networks (which is not currently an effective substitute) and to OAOs reselling Eircom's line rental product relying on SB-WLR.

4.5.3 What if the GAP USO is ceased?

If the GAP USO were to be ceased, considering the analysis conducted above, Eircom would be likely to act differently in the different areas depending on the price constraint.

Market-driven infrastructure-based competition areas

Absent any GAP USO, Eircom may wish / be forced (in order to remain competitive) to maintain or effectively decrease its line rental price like it did (but then removed) through the use of a promotional discount for SB-WLR in respect of certain bundled offers.

NBP areas

In NBP areas, the situation is similar to the Eircom only areas at least in the next 5 years (see below).

"Eircom only" areas

In these areas, the level of infrastructure-based competition is relatively less but Eircom could in principle be more constrained by customers' price sensitivity. However, the outcome of the consultation on the review of the pricing of regulated wholesale access services[111] is very relevant for these areas. If the current regime is kept (retail-minus), Eircom will have much greater incentives to maintain or increase its retail line rental price compared to a situation where SB-WLR becomes cost oriented.

If SB-WLR becomes cost oriented, any increase in Eircom's retail line rental price should in principle increase the attractiveness of offers proposed by OAOs relying on SB-WLR, if they do not increase their prices or seek to reduce prices. Also, any increase in Eircom's retail line rental price in Eircom only areas would only be possible if at the same time a decrease in other areas is observed (because of the retail price cap): for example, if the retail price cap is 20 and is interpreted as a national average price cap, increasing prices in Eircom only areas above 20 is only possible if the line rental price falls below 20 in the rest of the country so that the national average price

[111] Eircom's Wholesale Access Services:

Further specification and amendment of price control obligations in Market 4 and Market 5 and further specification of price control obligation in Market 2 http://www.comreg.ie/publications/consultation_on_current_generation_wholesale_access_services.583.104879.p.html

remains below the price cap. Such a hypothetical scenario would allow operators relying on SB-WLR to be more competitive in rural areas.

However, even under this scenario a retail line rental price increase cannot be excluded:

- First because sufficient migration from Eircom to operators relying on SB-WLR such as to constrain Eircom can take time (time for customers to be aware of price differences, time to switch, etc.),
- Second because operators relying on SB-WLR may wish to follow the same pricing strategy as Eircom (i.e. increase prices in Eircom only areas and decrease prices in more competitive areas though potentially paying a nationally averaged SB-WLR price). If the retail-minus regime is kept, they would have to follow Eircom's pricing strategy as they are virtually resellers of the Eircom retail voice product.
- Third because fixed wireless technologies currently act as an insufficient constraint on Eircom and mobile coverage does not reach 100% (4% of the population remains not covered by 3G, see §3.2.2.3) even if substitutability is likely to increase over time.

As a consequence, at least in areas where mobile coverage is not available, there is a risk standalone fixed voice customers would not be able to easily switch to any alternative operator (relying on SB-WLR) and therefore would have no choice but to have no AFL in case Eircom decides to locally increase prices.

As a consequence, absent any GAP USO and despite some existing constraints on the retail line rental price, it cannot be excluded that Eircom may wish to increase prices in specific areas where constraints are yet insufficient or relatively less, such as areas with no wireless coverage, which could exclude people from AFL. Even in areas with wireless coverage, the absence of fixed voice offers in the market based on wireless networks means that an increase in prices cannot also be excluded. Assuming customers would not switch to alternative operators relying on SB-WLR (if SB-WLR is cost oriented), the number of affected customers can be estimated:

- **18% of the number of fixed line customers in Eircom only and NBP areas (see Table 5) if wireless networks are not used to provide alternative AFL solutions, i.e. 100,000 customers.**
- **18% x 4% = 0.7% of the number of customers in "Eircom only" and NBP areas if wireless networks provide AFL solutions, i.e. 5,000 customers** but

this number could be greater since mobile networks prices are seen as expensive in Ireland[112].

4.6 Terms and conditions must be established in such a way that the subscriber is not obliged to pay for unnecessary facilities or services. Expenditure control shall be ensured and unwarranted disconnection of service avoided

As provided for by Regulation 9 of the Regulations, the USP is obliged to:

> *"- Provide selective call barring facilities for outgoing calls to national, mobile, international and premium rate numbers. The call barring facility in respect of premium rate numbers shall be provided free of charge to users.*
>
> *- Maintain and publish its scheme to allow for the phased payment of connection fees.*
>
> *- Maintain and publish its disconnection policy in connection with non-payment of bills."*

Call barring service is an efficient tool to help the most vulnerable consumers to control their expenditures and should be maintained. This option is used by several thousand Eircom end-users (see Table 8).

Table 8 – Eircom Lines with customer requested barring services

With respect to call barring, it is to be noted that a preliminary consultation was issued by ComReg earlier this year[113]. ComReg is consulting as to whether regulatory intervention would be appropriate to ensure that any necessary facilities are made available to all consumers and not only customers of the USP. Depending on the outcome of this consultation, call barring may be mandatory for all operators in Ireland.

Obligation on phased payments for connection fee have not been used over the last years as Eircom has maintained and renewed a Residential PSTN Connection Promotion during the five year period. Under this promotion connection charges are set at €0. As such no customers have incurred connection charges or sought to rely on the phased payment facility for connection charges[114].

[112] See responses to QB4.1, page 122 of the e-communications and telecom single market household survey report of March 2014

[113] http://www.comreg.ie/_fileupload/publications/ComReg1531.pdf

[114] ComReg S13D USO Submission 09Jun15

Avoiding unwarranted disconnection is an important feature to avoid social exclusion considering the importance of AFL.

Table 9 - Number of customers who have been temporarily out of service or disconnected under Eircom's disconnection policy

In the absence of USOs, it can be envisaged that the number of disconnections / cessations would raise and the average debt value would decrease.

For the disconnection policy but also for call barring (if call barring is not imposed by ComReg as a result of the separate consultation process), it cannot be excluded that they would not be maintained by Eircom in the absence of AFL USO as these services generate a cost for Eircom and can prevent Eircom to earn additional revenues from high rate calls. In addition, absence of these services is unlikely to represent a significant reason for end-users to switch to another supplier[115].

4.7 AFL has to be provided with the QoS levels defined by the Member State

4.7.1 Context and approach

With respect to QoS USOs, ComReg has defined a number of targets to be met at the national level (see §2.2.1). Penalties have been defined in case Eircom fails to meet these targets as the USP.

Considering latest and future infrastructure-based competition, Eircom's incentives to maintain an adequate level of QoS are different across the country:

- In **market-driven infrastructure-based competition areas**, Eircom is likely to need to maintain / improve its QoS to be able to compete.
- In **NBP areas**, two situations can be envisaged:
  - If Eircom wins the NBP bid, Eircom may not want to improve QoS in these areas to facilitate migration from copper to the NGA infrastructure;
  - If Eircom loses, it will be forced to maintain / improve QoS in order to compete and generate revenues from the retail line rental for as long as possible.

[115] See ComReg 12/117a

- In **"Eircom only" areas**, Eircom may have lower incentives to invest to maintain QoS. Competition from mobile and wireless technologies may mitigate this risk.

The aim of this section is:

- first to understand Eircom's possible behaviour with respect to QoS at the national level, assuming it will act as profit-maximising company (see §4.7.2);
- second to observe how Eircom behaved in the past with respect to QoS levels across the territory. Indeed, Eircom's obligations are national obligations and therefore nothing prevents Eircom to target its investments to improve QoS in some areas and not in others. As a consequence, in order to understand what would happen absent any AFL QoS USO, it can be useful to observe how several metrics evolved over the last few years at a sub-national level (see §4.7.3).

These analyses will enable to conclude on the possible scenario absent any AFL QoS USO (see §4.7.4).

4.7.2 Eircom's possible investment strategies with respect to QoS

In order to assess the likely behaviour of Eircom in the absence of QoS USO, it is important to determine whether Eircom has financial incentives investing in its network to reduce the number of faults. As a consequence, two scenarios need to be studied:

- **'Keep investing' scenario**: Eircom keeps investing in the network in order to maintain the level of faults and has a lower number of faults to repair.
- **'Stop investing' scenario**: Eircom stops investing in the network and the network keeps deteriorating. The number of faults to be repaired increases.

To quantify these scenarios from a financial point of view, the assumptions used to design PIP3[116] program have been used:

- The number of working lines is ✂;
- The Line Fault Index increases by ✂% every year due to the natural degradation of the network;
- The cost to remove a fault (preventive maintenance, asset replacement) is €✂;
- The cost to repair a fault is €✂[117] ✂;
- Eircom will invest €✂ in 2015 and 2016;
- Eircom will invest €✂ per annum from 2017 in the "keep investing" scenario (investment required to get a stable LFI);
- Eircom will not invest at all from 2017 in the "stop investing" scenario.

[116] PIP 3 eircom Response to Comreg questions presented on 21Jul 2014

[117] LFI Financial Analysis_v2 for LLU

In the “keep investing” scenario, the LFI remains stable over the period at around 14.5% (PIP3 target). In the “stop investing” scenario, the LFI reaches ✂% in 2022 (see Figure 39) and therefore more faults have to be repaired which increases the level of operating expenditures.

Figure 39 – LFI evolution in the “keep investing” (blue) and the “stop investing” (red) scenarios

The savings generated by the “stop investing scenario” can be significant as compared to the “keep investing scenario”, even more in a context of ceased USOs when there are compliance implications (such as penalties) for non-compliance with QoS targets (see Figure 40):

- Total 2015-22 for the “keep investing” scenario: €✂m (without penalties);
- Total 2015-22 for the “stop investing” scenario: €✂m (without penalties).
- Not investing is therefore less costly by €✂m.
- With penalties, the situation would be significantly different since the cost under the “keep investing” scenario would be €✂m while it would be €✂m in the “stop investing” scenario. Therefore, Eircom would have strong incentives to invest, which shows that the calibration of the QoS targets is adequate.

It is to be noted that the qualitative and quantitative analysis on investment performed in section 4.7 falls within the general approach of section 4, that is to say assess Eircom behaviour in the “worst case but possible scenario”. In reality, the amount of network investment is not solely driven by the USOs in place but also by a number of additional parameters (operator strategy, customers’ expectations and agreements in terms of available service and QoS, network integrity, competitive pressure, etc.).

Figure 40 – Yearly faults-related costs in the “keep investing” (blue) and the “stop investing” (red) scenarios

As a consequence, acting a profit-maximising operator, Eircom would have incentives to reduce its investment in the network absent any QoS USO. However, this remains true in the short and medium term: in the long run the costs of repairing faults may exceed “no investment savings”. The high number of faults could lead some customers to move to other infrastructures.

It is also important to note that deterioration in the level of QoS would be significant: the LFI would increase to 14.5% in 2016 and 17.6% in 2020 meaning a fault every 6

years). This would affect in the same way both Eircom and OAOs relying on Eircom's copper network (with SB-WLR or with ULMP)[118].

4.7.3 Geographical assessment of AFL QoS levels in the past and looking forward

Eircom's obligations with respect to QoS are national obligations (there is no obligation to provide geographically average QoS levels) and therefore nothing prevents Eircom to target its investments to improve QoS in some areas and not in others. As a consequence, observing how QoS levels and investments evolved in the last few years in the 3 different areas identified earlier can provide relevant indications as to how Eircom could potentially differentiate QoS looking forward.

4.7.3.1 Fault occurrence

The level of fault per line (Line Fault Index or LFI) is very different in the 3 areas:

- The LFI in market-driven infrastructure-based competition areas is ✂% (1 fault every ✂ years) in 2014;
- The LFI in Eircom only areas is ✂% (1 fault every ✂ years) in 2014;
- The LFI in NBP areas is ✂% (1 fault every ✂ years) in 2014.

The level of QoS is therefore very heterogeneous over the country. In particular, a LFI of ✂% appears to be relatively extreme. However, these facts should not be used to conclude that Eircom has more incentives to have greater levels of QoS in areas where competition is greater. Indeed, the reason for such disparities in terms of QoS is largely explained by the fact that a significant amount of infrastructure is underground in market-driven infrastructure-based competition areas (and therefore cables are less prone to faults) while a significant share of infrastructure is overhead in other areas (see Table 10 which provides an estimate of the share of overhead and underground infrastructures in Eircom's copper network).

Table 10 - Estimate of the percentage of overhead and underground infrastructure for the 3 areas

✂

This static analysis needs therefore to be complemented by a dynamic analysis. From a dynamic analysis, the level of faults in the 3 areas has remained relatively stable, except in 2014 (but the fault occurrence level has significantly increased in 2014 due to massive storms).

[118] The impact is therefore different from an increase in the retail line rental price if SB-WLR is cost oriented since in this latter case, Eircom and OAOs are differently impacted by an increase in Eircom's retail line rental.

Figure 41 – Yearly faults occurrence rate between 2010 and 2014 – Retail lines only

It could have been envisaged that due to the heterogeneous competitive environment in the different areas, different evolution faults occurrence rates could be observed (for example an increase in Eircom only or NBP areas). This has actually not been the case and LFI in areas with less competition did not increase or decrease faster than in market-driven infrastructure-based competition areas.

Because in the past Eircom could have let the number of faults increase much more in areas with less competitive pressure (because the QoS USO is at the national level), Eircom would not necessarily in the future let the number of faults rise significantly in areas with less competitive pressure. However, given existing and future competitive constraints, such a scenario cannot be excluded. Also, the number of faults is only one facet of QoS: others are analysed below.

4.7.3.2 Fault repair time

Contrary to the level of faults occurrence, there are no technical reasons to believe that repair times should be higher in areas with market-driven infrastructure-based competition, NBP areas and “Eircom only” areas. This is because the number of staff ensuring the maintenance of the access network can be adjusted and distributed according to the number of faults (except of course in the case of exceptional events). Therefore the level of fault repair time reflects somehow some actual strategic choices.

It is observed that the share of faults repaired in less than 2 working days is significantly lower in NBP areas (✂) as compared to market-driven fixed network competition areas (✂): a ✂ difference is therefore observed (Figure 42).

The difference is even higher for 2014. However, for 2014, this can be explained by the damages made by storms that are much more significant in areas with overhead networks and the difficulty to quickly relocate maintenance staff.

Figure 42 – Percentage of faults repaired in less than 2 working days – Retail lines only

The differences in repair times are less pronounced for faults repaired in less 4 working days, less than 5 working days and less than 10 working days (see Figure 43, Figure 44 and Figure 45).

Figure 43 – Percentage of faults repaired in less than 4 working days – Retail lines only

✂

Figure 44 – Percentage of faults repaired in less than 5 working days – Retail lines only

✂

Figure 45 – Percentage of faults repaired in less than 10 working days – Retail lines only

✂

The longer repair times observed above seems to be explained by the way staff responsible for the maintenance of the access network is distributed across the country (see table below). It can be observed that the number of fault to be handled per staff member is significantly lower in market-driven infrastructure based competition areas compared to other areas.

Table 11 - Average number of faults per staff

✂

Based on this analysis, it can be imagined that **in the absence of QoS AFL USOs, Eircom may tend to favour areas with infrastructure-based competition even more than that and ensure shorter repair times in these areas as end-users are more likely to switch supplier in case of long faults.**

4.7.3.3 Access network investment

Even though the evolution of the number of faults per line does not exhibit different patterns in the 3 areas (see §4.7.3.1), it is relevant to observe the level of investments in the access network per area.

Total yearly investments per area are represented in the figure below (Figure 46). It is interesting to note that in the last 5 years the level of investment in market-driven infrastructure-based competition areas increased significantly while the level of investment in NBP areas decreased a lot and the level of investment in Eircom only area slightly increased.

Figure 46 – Yearly investment in the access network per area since 1975

✂

When compared to the number of faults, these investments have been significantly higher in market-driven infrastructure-based competition areas over the last couple of years (see Figure 47).

Figure 47 – Yearly investment in the access network per retail line fault

When compared to the number of active lines, no clear trend can be identified as depending on the years, target is more on NBP areas or on “Eircom only” areas (see Figure 48).

Figure 48 – Yearly investment in the access network per active line

Despite a higher level of fault occurrence in areas with limited competition, Eircom tends to invest rather in areas with market-driven infrastructure-based competition compared to the level of faults. This trend is likely to be reinforced if QoS USOs were ceased.

4.7.4 Conclusions

Acting as a profit maximising company and absent any AFL QoS USO, Eircom would have financial incentives not to invest significantly in the short to medium term to reduce the number of faults.

Eircom’s AFL QoS USOs are imposed at the national level. Therefore, in the past few years, Eircom could have decided to target certain areas against other as long as at the national level QoS USOs are fulfilled. Analysing QoS performances in each area demonstrates that:

- The level of fault is much greater in NBP areas and Eircom only areas. However, this can be explained by the significant presence of overhead infrastructure which is more prone to faults;
- Time to repair faults is longer in NBP and Eircom only areas;
- The distribution of staff per fault shows that the amount of staff is proportionally lower in NBP and Eircom only areas;
- Finally the amount of investment per fault is lower in NBP and Eircom only areas.

In NBP areas for example, a fault occurs every ✂ years and the probability to have this fault repaired in more than 4 days is ✂ %. Over 5 years, an average customer in NBP areas would have no service during ✂. Over 5 years, an average customer in Eircom only areas would have no service during ✂. Over 5 years, an average customer in market-driven infrastructure-based competition areas would have no service during ✂.

Absent any QoS AFL USOs, it cannot be excluded that these trends would further increase[119].

[119] Also, Eircom may wish to replace copper by wireless solutions such as FCS but in this case, FIA would not be available and the level of fault would be unknown.

5 Recommendations

The previous section has assessed whether or not absent any AFL USO and left to the operation of market forces alone, basic services required by the Universal Service directive would be provided to everyone. It also assessed whether or not these would be provided at affordable prices or with an acceptable level of QoS. Each element of the AFL USO has been analysed.

This last section aims at concluding whether there is a continued need for an AFL USO (see § 5.1). Also, in light of the review of the trends as well as the potential impacts of the absence of AFL USO at different geographic levels, the report analyses whether AFL USO could be removed in some parts of Ireland (see §5.2). Finally, technologies and networks reviewed and described in this report are compared together to asses which ones are the most adequate for the provision of AFL USO (see §5.3).

5.1 Is there a continued need for AFL USO?

Considering the scenarios identified in §4, it cannot be excluded that for the next 5 years, absent any AFL USO, the necessary requirements regarding AFL as set out in the Universal Service Directive, transposed in Ireland as the Universal Service Regulations would not be met:

- There is a risk that some reasonable requests for connection at a fixed location to a public electronic communications network may not be met because the incremental revenues generated by these new connections may not be sufficient for a profit-maximising operator. Even assuming wireless technologies could be used to connect these customers, the absence of full 3G-4G coverage and the fact that FCS and GSM do not support FIA would still mean that some connections may not be met.
- In the presence of AFL USO Eircom's unprofitable customers could be connected on the basis of alternative access technologies. However, the risk is that such alternative access technologies would not be able to provide FIA (like FCS). Or that they would offer an incomplete coverage (3G or 4G). In the future, with the extension of mobile network coverage and the improvement of QoS, this risk would likely be lower.
- Despite existing and growing potential future constraints on the retail line rental price, it cannot be excluded that Eircom would increase retail line rental prices, especially for standalone voice access customers who do not value broadband or bundles, who would not easily switch to mobile or are not covered by any wireless technology. If SB-WLR was to be cost oriented, operators relying on SB-WLR could generate an additional constraint but some customers may not be able to switch relatively quickly.
- For disconnection policy but also for call barring (if call barring is not imposed by ComReg as a result of the separate consultation), it cannot be excluded that they would not be maintained by Eircom in the absence of AFL USO as these

services generate a cost for Eircom and can prevent Eircom to earn additional revenues from high rate calls.

- It is likely that QoS would deteriorate (or that wireless technologies would be used by Eircom), especially in Eircom only and in NBP areas. From a financial point of view, there is a risk that Eircom would have financial incentives not to invest significantly in the short to medium term to reduce the number of faults. Also the observed divide between market-driven infrastructure-based competition areas and Eircom only/NBP areas in terms of QoS could worsen.

This assessment shows that, in TERA Consultants' view, there is continued need for an AFL USO in Ireland, especially with respect to the RAT component, the FIA component, the QoS component and the GAP component. In almost all cases, wireless technologies could be used in theory to provide AFL but two main difficulties would arise: some technologies do not support FIA and there is no wireless technology with full coverage of the territory. In addition to that, in practice, wireless technologies are currently not used in Ireland to provide AFL (such as a 'Homezone" service). As a consequence, the Universal Service Directive requirements would not be met. However, it is envisaged that wireless technologies as well as other emerging access technologies are likely to generate greater competitive constraints on the provision of voice AFL in the future.

The scenarios identified above cannot be excluded and they would not adequately address, for the next 5 years, the necessary requirements regarding AFL as set out in the Universal Service Directive.

It is of course very difficult to assess the impact of a scenario absent AFL USO. The following table attempts to summarize the number of customers that would be affected by the absence of AFL USO in a worst case (but possible) scenario:

Table 12 – Population impacted if USOs are ceased

AFL element	Population impacted if USOs are ceased
RAT	Between ✂ and ✂ reasonable requests for connection would not be met over 5 years. If wireless technologies were used to connect these customers, either they would not get FIA (FCS) or ✂ customers would not be served because of absence of coverage (3G-4G, but in practice it is not currently used to provide AFL in Ireland)
FIA	✂ customers[120] may become connected with wireless technologies. If FCS is used, these customers would not get FIA. If 3G-4G is used (but in practice it is not currently used to

[120] It is observed that this figure is stable over the years according to the USF model.

	provide AFL in Ireland), ✂ customers (✂%) would not get FIA.
GAP and affordability	In Eircom only and NBP areas, a maximum number of 100,000 customers would potentially not be able to get AFL anymore in case of price increases. Assuming 3G-4G is used to provide AFL (but in practice it is not currently used to provide AFL in Ireland), 5,000 would still be unable to get AFL anymore but this number could be greater since mobile networks prices are seen as expensive in Ireland[121].
Terms and conditions and control of expenditures	No data is available to quantify the impact. ✂ end users with Premium Rate Service Barred. Number of disconnections (✂ in 2014) and cessations (✂ in 2014) due to debts likely to rise.
QoS	Potentially all end-users but more likely for end-users living in Eircom only or NBP areas (~50% active lines). It is noted that over 5 years, an average customer in NBP areas has no service during ✂ days. Over 5 years, an average customer in Eircom only areas has no service during ✂. Over 5 years, an average customer in market-driven infrastructure-based competition areas has no service during ✂ day. These metrics would deteriorate absent any QoS USO.

Source: TERA Consultants

As a consequence, there is a continued need for an AFL USO in Ireland in the next 5 years.

5.2 Could AFL USO be removed in some areas of Ireland?

Currently, AFL USOs are defined at the national level in Ireland and the USP is designated at the national level. The analyses in the previous sections of this report have highlighted significant geographic differences in terms of competitive constraints, in terms of network availabilities, in terms of network costs, etc. Some areas are unlikely to be affected absent any AFL USO while others would be significantly affected.

As a consequence, it could be relevant to impose AFL USOs at a subnational level only, for example, in Eircom only or NBP areas, leaving other areas without AFL USOs.

The benchmark (see annex §7) highlights that no country has in practice implemented such an approach. Portugal has however followed a similar but different approach. ANACOM applied a geographic segmentation to provision the USO in order to achieve

[121] See responses to QB4.1, page 122 of the e-communications and telecom single market household survey report of March 2014

the efficiency of the process of designating the USP and ensure that "*no undertaking is excluded a priori from being designated*". During a public consultation, three zones were presented (north, centre, and south). The segmentation was carried out by ANACOM based on a balance between accomplishing contestability, which would suggest a large number of zones, and the aim of ensuring a minimum level of critical mass and the harnessing economies of scale in delivery of services, with the restriction that these zones had to be constituted by contiguous administrative units[122]. In practice, the same USP was however selected at the end of the process (but the USP is not anymore the incumbent).

It is to be noted that the approach proposed in Portugal does not consist in removing any AFL USO in given parts of the country but rather increasing contestability of the provision of USO.

In the specific context of Ireland, leaving areas without any AFL USO and USP does not seem a relevant option:

- First of all, a precise identification of customer groups and or an exact definition of areas which may continue to need AFL USOs is almost impossible. These customer groups/ areas are extremely dispersed nationally and potentially moving over time. The maps published in this report highlight this dispersion of potential USO needs. The difficulty of defining such potential consumers/areas is significant from a static point of view and from a dynamic point of view (especially with the current deployment of alternative infrastructures such as SIRO or the NBP). Also, exact network coverages are not perfectly known. It cannot be excluded that one customer could be said to be covered while it is not in practice.
- Second, having national AFL USOs and a national designation of a USP could allow greater flexibility in the design of AFL USO and in the management of the obligations as relevant. For example, the obligation to meet all reasonable requests for connection at AFL is better achieved at a national level: even if unreasonable requests are more likely to happen in the most remote areas, some could also exist in more urban areas where AFL USO would *a priori* be less needed. In such a case, the absence of any AFL USO in some parts of the country (here urban areas) would not be consistent with the requirement of the Universal Service Directive. From a more general point of view, narrowing areas where AFL USOs are imposed constrains the flexibility to monitor Universal Service.
- Third, in the presence of significant network cost differences over the territory, obligations such as national GAP provides solidarity between sub territories and significantly lowers the digital divide. It is obvious that without national AFL

[122] 1. ICP-ANACOM, Public Consultation Report on the Process of the Designating the Provider of the Universal Service of Electronic Communications, March 2011.

2. Ordinance 318/2012, of 12 October 2012 (accessible through: http://dre.tretas.org/dre/304132/).

USOs and without a national USP, such mechanism would be very difficult to implement and the prices in some areas could go up to a significant extent.

As a consequence, there should be no areas without AFL USOs in the specific context of Ireland at least over the next 5 years and especially as long as the NBP network is not fully deployed. However, this does not mean that specific obligations could not be defined differently from an area to another. For example, §4.7 has identified very different levels of QoS over the Irish territory and defining QoS targets at a subnational level could potentially have some benefits.

5.3 Which technologies and networks support AFL USO?

The analyses conducted in this report have enabled to compare technologies, operators and networks together, especially in §3.2. The table below compares networks available in Ireland and their ability to provide AFL USO. It shows that Eircom's copper network has significant advantages over other technologies and networks for the provision of AFL USO in Ireland at the national level. In particular its coverage and the fact that it supports FIA are advantages that are not met by any other network in Ireland (3G, 4G, other wireless networks, UPC, FTTH networks do not have sufficient coverages and FCS and 2G do not support FIA). However, in specific instances and for some customers, Eircom's copper network could be complemented by other technologies (such as 3G or 4G) to provide connection and/or FIA at a cheaper cost.

Table 13 – Advantages and disadvantages of networks in Ireland with respect to the provision of AFL USO

	Advantages for the provision of AFL USO in Ireland	Disadvantages for the provision of AFL USO in Ireland
Copper network	Full coverage of Ireland Supports voice, facsimile and FIA	In some cases, the cost connect to new customers can be very expensive In some cases, speeds available for Internet access are too low
FTTH – Eircom	Supports voice, facsimile and FIA	Small coverage
FTTH – SIRO	Supports voice, facsimile and FIA	Small coverage
UPC	Supports voice, facsimile and	Not sufficient coverage

	FIA	
NBP	In theory supports voice, facsimile and FIA	Not yet deployed It is not yet known whether retail offers will provide these services at affordable prices
2G at a fixed location / FCS	99% coverage Cheaper technology compared to wired technologies	1% of the population is not covered with 2G[123] No AFL offers available in Ireland (a roof-top antenna would be needed) Does not support FIA Cost to connect uncovered areas can be very expensive (need to deploy a new base station) QoS can deteriorate with bad weather conditions
3G at a fixed location	Supports voice, facsimile and FIA Cheaper technology compared to wired technologies Even if currently not a full substitute to fixed voice, the level of substitutability is likely to increase over time	4% of the population is not covered[124] No AFL offers available in Ireland (a roof-top antenna would be needed) Cost to connect uncovered areas can be very expensive (need to deploy a new base station) QoS can deteriorate with bad weather conditions
4G at a fixed location	Supports voice, facsimile and FIA Cheaper technology compared to wired technologies	Not sufficient coverage No AFL offers available in Ireland (a roof-top antenna would be needed) Cost to connect uncovered areas can be very expensive (need to deploy a new base

[123] See §3.2.2.3.1

[124] See §3.2.2.3.1

		station) QoS can deteriorate with bad weather conditions
Other fixed wireless technologies	Supports voice, facsimile and FIA Cheaper technology compared to wired technologies	Not sufficient coverage QoS can deteriorate with bad weather conditions

Source: TERA Consultants

6 Annex A: List of acronyms

Acronym	Definition
3G	Third generation wireless telephone technology
4G	Fourth generation wireless telephone technology
ACM	Authority for consumers and markets (Regulatory Authority of the Netherlands)
ADSL	Asymmetric Digital Subscriber Line
AFL	Access at fixed location
AKOS	Agency for Communication Networks and Services of the Republic of Slovenia (Regulatory Authority of Slovenia)
ANACOM	Autoridade Nacional de Comunicaçöes (Regulatory Authority of Portugal)
ARCEP	Autorité de régulation des communications électroniques et des postes (Regulatory Authority of France)
BEREC	Body of European Regulators of Electronic Communications
BS	Base Station
BWA	Broadband Wireless Access
CAPEX	Capital Expenditure
COMCOM	Federal Communications Commission (Regulatory Authority of Switzerland)
CPI	Consumer Price Index
CTU	Regulatory Authority of Czech Republic
DSP	Department of Social Protection
EC	European Commission
ECJ	European Court of Justice
EETT	National Telecommunications Commission (Regulatory Authority of Greece)
ESB	Electricity Supply Board
ETSI	European Telecommunications Standards Institute
EU	European Union
FACO	Fixed Access and Call Origination
FCS	Fixed Cellular Service

FIA	Functional Internet Access
FTTB	Fibre to the Building
FTTC	Fibre to the Cabinet
FTTDP	Fibre to the Distribution Point
FTTH	Fibre to the Home
FVA	Fixed Voice Access
FVCO	Fixed Voice Call Origination
FY	Fiscal Year
GAP	Geographically Averaged prices
GSM	Global System for Mobile Communications
HLVA	Higher Level Voice Access
IBPT	Institut Belge des Services Postaux et de Télécommunications (Regulatory Authority of Belgium)
ISDN	Integrated Services Digital Network
Kbps	kilobit per second
KPI	Key Performance index
LEA	Larger Exchange Areas
LFI	Line Fault Index
LLVA	Lower Level Voice Access
LTE	Long Term Evolution
Mbps	megabit per second
MDF	Main Distribution Frame
NBP	National Broadband Plan
NGA	Next Generation Access
NRA	National Regulatory Authority
NZ	New Zealand
OFCOM	Office of Communications (Regulatory Authority of the UK)
OPEX	Operating Expenditure
OTT	Over The Top
PIP	Performance Improvement Programme
POTS	Plain Old Telephone Service

PSTN	Public switched telephone network
PTS	Post and Telestyrelsen (Regulatory Authority of the Sweden)
QoS	Quality of Service
RAT	Reasonable Access Threshold
RFTS	Retail Fixed Telephony Service(s)
RRT	Communications Regulatory Authority (Regulatory Authority of Lithuania)
RTR	Rundfunk & Telekom Regulierungs GmbH (Regulatory Authority of Austria)
SB-WLR	Single Billing Wholesale Line Rental
SLA	Service Level Agreement
SMP	Significant Market Power
SPRK	Public Utilities Commission (Regulatory Authority of Latvia)
TA	Telephone Allowance
UK	United Kingdom
UMTS	Universal Mobile Telecommunications System
UKE	Office of Electronic communications (Regulatory Authority of Poland)
USD	United States Dollar
USF	Universal Service Fund
USO	Universal Service Obligation
USP	Universal Service Provider
VAT	Value Added Tax
VDSL	Very High Bitrate Digital Subscriber Line
VOIP	Voice Over Internet Protocol
VUA	Virtual Unbundled Access

7 Annex B: Benchmark of AFL USOs imposed by other NRAs in Europe

7.1 Scope of the benchmark

As explained in the previous section, USO arrangements in the European Union are governed by the EU's US Directive: the 2002/22/EC Directive and its subsequent amendment in 2009 (2009/136/EC). The EU US Directive defines the US as: "*the minimum set of services, of specified quality to which all end-users have access at an affordable price in the light of national conditions, without distorting competition*[125]".

Each Member State provides a legal basis for the provision of USO. Virtually all Member States have designated a USP (including for AFL USO). Even with such a context, the implementation of AFL USOs displays some variance across Member States. These different national implementations range from the acceptance that the market itself will be able to meet USO goals (Universal Service is viewed as a "*safety net (…) for those who financial resources or geographic location do not allow them to access the basic services that are already available to and used by the great majority of citizens and which are considered essential for participation in society*[126]") without intervention (regulation) to a more traditional practice of requiring the incumbent operator to fulfil USO.

A study of AFL USOs implemented in the different European countries can enable to identify European best practices. The benchmark is focusing on 16 Member States (Sweden, Spain, Italy, France, the UK, Poland, Portugal, Slovenia, Greece, Romania, Belgium, Latvia, Lithuania, Netherlands, Austria and the Czech Republic) plus Switzerland[127].

The current scope of AFL USO consists of a connection to the public communication[128] network at a fixed location supporting voice and Functional Internet Access (FIA) for facsimile and data transmission.

Only two Member States (Germany and Luxembourg) have not designated any USO provider considering that USO can be achieved by the market[129]. In Sweden there is a USO but there is no designated universal service provider to fulfil the obligation. Some other Member States have reduced the scope of US by withdrawing some components

[125] UE USO 2002/22/EC Directive. Art. 1.2.

[126] European Commission. Communications on the review of the scope of Universal Service in accordance with Article 15 of Directive 2002/22/EC, 24 May 2005.

[127] Of the EU15, two countries are not described: Denmark and Finland. In Finland, a recent amendment in the national legislation provides FIA with a data-rate of 1 Mbps.

[128] Originally "connection to public *telephone* network" (2002/22/EC). The 2009 amendment stresses on the functional aspect of the USO component regardless of the underlying technology used to fulfil the obligation.

[129] In Germany, Deutsche Telekom provides service at a commercial basis to all geographic areas of the country without any special obligation.

from the USO designation, like the provision of AFL service in the Czech Republic and Austria, or the provision of public payphones and directory services in Estonia.

The main findings, regarding the implementation of USO AFL component through 17 benchmarked European countries are highlighted as the following.

7.2 Service provisioning upon reasonable request

The 2002 Universal Service Directive imposes service provisioning upon reasonable request, but the European legislation has left a significant margin for NRAs to appreciate the "reasonableness" of a user's request.

Through the benchmark diverse national transpositions of such an obligation are reported. Generally, these transpositions remain unchanged.

In some countries (like the UK, Romania, and the Czech Republic), the "reasonableness" is related to a given threshold cost beyond which the user has to pay an extra charge compared to what he would have to pay in a regular situation. This extra charge is generally equal to the cost gap.

Setting the threshold was found generally prone to discussions between the USP and the regulator. In the UK for instance, the threshold (£3,400) corresponds to 100 man-hour effort (historically assessed by BT) usually required to roll out the connection. In Romania (€5,000) this corresponds to a calculation on the average investment required to install the last mile connection in rural areas, **this threshold was set-up irrespectively of the technology used to provide the AFL USO (either using a wireline or a wireless technology)**. In the Czech Republic, the request is considered non reasonable if the setting of a connection (**either using a wireless or a wireline technology**) entails costs beyond the "usual amount", though no valuation of such "usual amount" was specified. In Austria, the threshold is geographically defined (location up to 500 meters from the nearest exchange cabinet). In Greece, a request is considered reasonable provided that the incurred installation cost is less than €1,900 whatever the technology used (either wireless or fixed technology) to fulfil the request. In all cases, where a threshold is set to quantify the reasonableness of the connection's request, the additional cost (the amount exceeding the defined threshold) should be paid by the customer.

Countries like the Czech Republic have specified the concept of reasonableness as the user's residence or place of business (thus the obligation is provided to both resident and business customers), while some others like Spain had already restricted the concept only to regular residents and specifically to their primary residence. In the case of Spain, the legislation goes further by referring reasonable request to edification even if it is not on urban land.

The reasonableness of the request was also defined in some countries as the ability for the USP to provide the service: the connection has to be provided using the own network of the USP or through the network of another operator and alternatively

through a mobile network if the signal of at least one mobile operator is available at user's location (in that case the NRA chooses to stress on the lever of technological neutrality specified by the EU Directive) as it is the case in the Czech Republic.

The extent of the reasonableness of the request was subject to a consultation with operators in Portugal where operators asked for a clear definition of the criteria to access reasonableness. ANACOM (the Portuguese regulator) has chosen to keep the large definition specified in the Directive and to maintain such status quo arguing that at the time being previous designated USPs had not encountered difficulties to comply with such an obligation in its broader definition.

Table 14 – Summary of identified criteria to assess "reasonableness"

Country	Criteria to assess "reasonableness"
Czech Republic	• Not exceeding the usual cost of setting a connection, or • Mobile network coverage availability with respect to the reference radio signal level specified in the ETSI Standard.
Romania	• Installation cost of the connection less than €5,000 (additional costs being covered by the subscriber) irrespective of the technology used to provide the connection (fixed or wireless).
UK	• Installation cost less than £3,400 corresponding to 100 man-hour to set up 160 meters of overhead cable or 25 meters of ducted cable (additional costs being covered by the subscriber)
Austria	• Fixed location not more than 500 meters away for the closest network distribution point (additional costs being covered by the subscriber)
Greece	• Fixed location not more than 200 meters away from the closest network distribution point, or • Mobile network coverage availability (subject to the reference radio signal level specified in the ETSI Standard), or • Estimated costs for installation (wired/wireless) less than €1,900 (additional costs being covered by the subscriber)

Source: TERA Consultants analysis

7.3 Affordability

All of the countries studied impose measures in order to have affordable access for the AFL component. This can be done through the introduction of social tariffs and/or price control.

Social tariffs

Excepting countries like Switzerland and Sweden (for Sweden, there is no designated operator to provide universal service), other reviewed countries impose the designated USP to offer tariff options or social tariffs which depart from those provided under normal commercial conditions. Social tariffs can be presented in two broad categories:

- In the form of discounts and reductions for the subscribers who are entitled to claim the social tariffs, such as the case in Belgium, the Czech Republic, France, Portugal and Spain, or
- In the form of a special package such as BT Basic or the Light User Scheme in the UK.

The recipients of social tariffs in general consist of two groups: people on low income, and people with special social needs: i.e. the elderly, the disabled and war veterans. Some countries specify the threshold criteria for the definition of "low income", such as in the Belgium, France or the UK.

Table 15 – Summary of general eligibility criteria for social tariffs

Country	General eligibility criteria for social tariffs
Belgium	• The elderly of more than 65 years old • The disabled or hearing impaired. • War veterans.
Czech Republic	• People on low income • People with special social needs (disabled, retired)
France	• People on low income • Recipients of social benefits • The handicapped • War veterans
Italy	• People on low income (annual income of less than €6713 and belonging to a household with a recipient of a disability support or a pensioner). • The elderly of more than 75 years old
Poland	• People of low-income • Pensioners
Portugal	• Pensioners

	• Retired people • People on low income
Romania	• People on low income • People with special social needs
Spain	• People on low income (family income of less than or equal to 110% of the minimum wage)
UK	• People on low income • Recipients of social benefits • Recipients of employment support allowance
Austria	• Applicant must be at least 18 years old, • Resident of Austria, • Net household less than specific upper limit set by decree. • Applicant must receive a pension, care allowance, unemployment pay, federal aid or social benefit

Source: TERA Consultants analysis

It is important to note that these criteria are the results of government policies (not NRA USO decisions).

Price control

Regarding price control, this can be done in the form of a price cap policy (France, Portugal, Latvia, Belgium, Poland, and Sweden). This obligation was imposed under the USO legal basis in France, Portugal and Latvia.

In Belgium in particular, in 2014, a Royal decree places the price cap policy with the principle of uniform affordable tariffs that must be less than or equal to the most financially competitive offer available in the market.

7.4 GAP

The majority of the countries studied impose the application of geographically average pricing for the AFL component within the USO framework. It is noticed, however, that some countries do not require such an obligation: Austria, Latvia, Netherlands, Romania and Switzerland. It is however worth noting that Austria, Latvia and Netherlands are quite dense countries. In Portugal, the national territory is segmented into three areas within which the criterion of “geographically average pricing” is applied.

7.5 Quality of Service (QoS)

Recent changes

In Belgium and France, targets have been loosened for certain indicators since it has been observed that USPs are faced with difficulties that are out of their control, either in fault fixing (Belgium) or in providing the initial connection (France).

The Polish authority has also identified failures by the USP to comply with QoS targets for several indicators due to bad weather but the QoS targets remained unchanged.

In Portugal, ANACOM has recently introduced reinforcement measures in order to make the publications of QoS results more visible to the NRA as well as to the public, such as imposing a standard format for reporting or communicating QoS measurements to the public through various channels (in all sales points, by sending contracts to users' homes or through distance communications).

More particularly, in Spain, given the new requirement for FIA to have at least 1 Mbps/256 Kbps[130] downstream/upstream applicable since 2012, the Ministry of Industry has added a new QoS requirement: speed data transmission achieved for downlink (average quarterly value) must be > 830 Kbps.

Table 16 – Summary of QoS targets

QoS indicator	Target	Countries
Time to provide connection for 95 % of contracts	< 5 working days	Belgium
	< 8 days	Slovenia
	< 10 days	Czech Republic, Italy
	< 12 days	French
	< 21 days	Poland, Portugal
	< 4 weeks	Greece
Fault rate per access line per year	< 7.5%	Belgium, French
	< 9.6%	Italy
	< 10%	Czech Republic
	< 11%	Poland
	< 15%	Slovenia
	< 16%	Spain
Time to fix fault (80% of cases)	< 35 clock hours	Belgium
	< 6 hours	Czech Republic
	< 12 hours	Slovenia

[130] The 1 Mbps data rate could be provided by any technology (Article 52, Law 02/2011).

	< 24 hours	Poland
	< 45 hours	Italy
Time to fix fault (95% of cases)	< 40 clock hours	Belgium
	< 12 hours	Czech Republic
	< 50 hours	Poland
	< 96 hours	Italy
	< 165 hours	Portugal
Time for national call connection establishment	< 2 seconds	Poland, Spain
	< 2.9 seconds	France
	< 3 seconds	Slovenia
	< 6 seconds	Czech Republic
Time for international call connection establishment	< 5 seconds	Slovenia
	< 10 seconds	Czech Republic[131]
Frequency of billing complaints	< 0.04%	Portugal
	< 0.08%	France
	< 0.28%	Italy
	< 0.5%	Czech Republic, Spain

Source: TERA Consultants analysis

7.6 Services (including Functional Internet Access (FIA))

Main capacities required

The main requirements from the fixed connection invariably include the capacity to give and receive national/international calls, the capacity for facsimile communications and the capacity for data communications.

In Belgium, in case of non-payment, the USP is also obliged to leave the line open in order for the subscriber to be called and to have the possibility to make calls to emergency services. In Romania, the USP has a similar obligation in case of non-payment so that the subscriber can still give and receive calls that do not require payments.

[131] Only recommended (not mandatory).

FIA

Table 17 – Minimum speed required for FIA in benchmarked countries

Country	Minimum speed required for FIA
Belgium, Finland Spain, Sweden	1 Mbps[132]
Romania, Lithuania	144 kbps
Portugal, Netherlands	56 kbps
United Kingdom, Slovenia	28.8 Kbps
Latvia	9.6 Kbps
Czech Republic	Narrow-band speed internet connection, but no specific data-rate was set up by the legislator/regulator[133]
France	"Sufficient connection rate that is normally offered by a telephone line". No specific data rate is given.
Poland	No specific data-rate was imposed in the Polish legislation. FIA must be supported at a rate enabling the use of common applications to handle "current daily life matters, in particular using electronic mails or application that support payments".

Source: TERA Consultants analysis

7.7 Measures for expenditures control

Almost all studied countries require the USP to provide adequate measures for the subscriber to control its expenditures upon contracting the Universal Service in accordance with the US Directive (2002/22/EC). These measures are specified in the contract, they are free of charge, some of them being mandatory (included de facto) while other are provided upon customer request.

[132] In Belgium, applicable during all year round, 24/7, except for a maximum period of 1 hour/day. In Spain, 1 Mbps/256 Kbps downstream/upstream speed (effective since January 2012). A download limit of 5 GBytes (the speed drops to 128 Kbps (downstream)/64 Kbps (upstream) once the limit is exceeded). In Sweden, the USP can provide the user with a lower data-rate connection if such data-rate cannot be satisfied by "any other connection "

[133] As of 2014, certain institutions are entitled to having a minimum connection speed of 30 Mbps within the USO scope.

These measures consist of:

- Phased payment of the price of the connection establishment,
- Selective call barring of outgoing calls to particular numbers (international/long distance calls upon customer request, premium rate service or those implying surcharge) generally specified by the regulator,
- Basic level of itemised billing (without including in the bill free calls (hotline/free-of-charge numbers)), and
- Prepayment of bills.

Several countries have implemented the recommended mechanisms for subscribers' alert in case of abnormal consumption (article (10) of USD 2002/22 Directive and subsequent amendment 2009/136/EC, annex I) by requiring the USP to provide the subscriber with free mechanisms for expenses checking. These mechanisms consist of user's account control and free alert in case of excessive or abnormal spending (the threshold is set by the user when contracting the service). Countries implementing free alert/account control mechanisms are: Czech Republic, Slovenia, Spain, Sweden and Portugal (introduced in 2011).

Measures of expenditures control are maintained within USO, except for the case of the Czech Republic where such an obligation has been removed in 2009 based on a regular monitoring of the need of imposing such measures as part of the USO. However, as the monitoring of the effectiveness of such a decision is still on-going, CTU (Czech regulator) remains free to put back the obligation if it is found to be relevant.

7.8 Changes in USO terms and conditions

National legislations have been amended in the perspective of further enforcement of consumer rights. Although these amendments are originally focused on general services, they are also applied by extension to universal services. Contracts will have to provide specific information to consumers such as minimum service quality levels, information on traffic shaping and how USPs deal with unusual level of congestion, maximum allowable durations of initial contracts have been restricted as well as contract termination fees in order not to dissuade a consumer from switching their providers. Some countries like the UK for instance expressed their willingness to push further the enforcement in special points of the amendment (like strengthening the procedures against abusively retaining subscribers).

7.9 Enabling AFL USO through wireless technology

The 2002 Universal Service Directive underlined "the technological neutrality" principle through which the obligation can be fulfilled. It was up to each European country to transpose the neutrality in its legislation and use such a requirement as a lever to ease

the provision of AFL service by candidate operators. In the review of transposition of "technological neutrality" requirement in national legislations, it was noticed that such an aspect has been implemented at different levels.

Indeed, apart from countries like Greece, the Czech Republic, Belgium, and Romania where the legislator has just recalled that the provision of universal service could be achieved either "through wireline or wireless technology", or alternatively worded as "through any prevailing technology", two countries (Portugal and Spain) confirmed such a requirement in practice. **Portugal for instance awarded the USO tender to a mobile-fixed operator (Optimus Telecommunicaçoes, a.k.a NOS)**. In the general/specific conditions[134] governing the agreement of the AFL USO service provisioning, it is stated that NOS provides with AFL USO to its customers using a wireless technology..

In Spain, Movistar (Telefónica) provides fixed Internet access at 1 Mbps through fixed or wireless technology depending on the particularities of the request.

In the Czech Republic, the possibility to enable AFL USO through wireless technology is envisaged in-line with the "reasonableness" criteria: a request is reasonable provided that the signal of at least one mobile operator is available at that ("difficult-to-access") location **with respect to a reference level specified in the ETSI EN 300 910 Standard**.

In Greece, the AFL USO connection could be provided using either a wireline or a wireless connection in accordance with technological neutrality.

In Romania, in order to ensure access and connection at a fixed location to the publicly available telephone services at household level, the national regulation authority (ANCOM) decided that the connection provided by "Home-zone"[135] access services by the operators of mobile public networks can be used by the designated USP.

In Sweden, although there is currently no appointed USP, the Stockholm Administrative Court issued in 2007 a judgment confirming the technological neutrality of USO and enabling its fulfilment using TeliaSonera's mobile network if necessary.

7.10 Key learnings from the benchmark

The review of AFL USOs in Europe first highlights that AFL USOs in Ireland are generally consistent with other AFL USOs in Europe:

[134] Accessed (in Portuguese) through NOS website: http://www.nos.pt/particulares/outros/condicoes-da-oferta-de-servicos/Documents/SU_Condi%C3%A7%C3%B5es%20Gerais%20e%20Espec%C3%ADficas.pdf

[135] "Home-zone" products are offered by mobile operators to foster fixed-mobile convergence. "Home-zone" services provides users with the possibility to initiate/receive mobile calls from their location while being charged as fixed call tariffs. However the mobility of the user is restricted to the geographical region surrounding its address (Technically, the user is assigned to a given predefined Base Station).

- Price cap and GAP are often imposed in Europe especially in countries with heterogeneous population densities,
- QoS performance targets are in the middle range of performance targets imposed in other countries,
- The minimum data rate for FIA in most countries is higher than in Ireland. 4 countries have a minimum data rate of 1Mbps,
- Obligations in relation to control of expenditures and to terms and conditions are very similar from a country to another.

Two main differences are however observed:

- In several countries (Belgium, Czech Republic, France, Italy, Poland, Portugal, Romania, Spain, UK, Austria), Governments have defined criteria for social tariffs,
- The RAT appears higher in Ireland compared to other countries.

It is also noted that several countries have implemented the recommended mechanisms for subscribers' alert in case of abnormal consumption by requiring the USP to provide the subscriber with free mechanisms for expenses checking. This is not imposed in Ireland.

Finally, in several countries (Portugal, Spain, Czech Republic, Greece, Romania, Sweden) the USP uses (or envisages to use) wireless technologies, as a complement to traditional wired technologies, to provide AFL connections.

8 Annex C: detailed view of AFL USO consultation respondents

Service connection upon reasonable request should be met:

- ALTO claims that the current Reasonable Access Threshold (RAT) set at €7,000 per connection should be reviewed.
- Eircom considers a reasonable request once there is a reasonable chance of return on investment in the medium to long term. Since 2014, Eircom considers that the current RAT of €7,000 is unreasonable relative to the potential return Eircom could earn on that investment over a period of 20 years; it is therefore Eircom's view that the RAT should be decreased [3]. Meanwhile, for the transitional designation period (till December 2015), Eircom agrees to continue to meet all reasonable demands within the current RAT.
- Magnet agrees with the necessity to review the current RAT obligation, but the operator has not specified whether the RAT should be increased or decreased. Magnet appeals for recording the reasons for believing the access request may exceed the RAT; this will help assess the relevance of the current threshold and more efficiently translate the concept of reasonableness.
- UPC claims for the use of alternative technologies to fixed network to fulfil AFL USO but this could not be achieved at the expense of modifying the RAT.

AFL must be capable of supporting voice, facsimile and a functional internet access

- ALTO claims for a modification of the current FIA (Functional Internet Access) regime, particularly, by increasing FIA data-rate to 2 Mbps to support broadband connectivity.
- ALTO believes that the inclusion of broadband within AFL USO scope should be achieved without increasing the RAT threshold.

- Eircom claims for rethinking the AFL USO scope in order to assess whether AFL is still currently relevant, bearing in mind the change of the electronic communications market landscape in Ireland since 2006 (a continuous increase of individual mobile phone access at the detriment of fixed access).
- Since 2012 consultation, Eircom highlighted the need for a joined up approach to be taken when devising a policy for universal availability of narrowband and broadband connections. Eircom claimed as well for the need to take into consideration the Government's NBP effect on setting the strategic landscape for the provision of communications services in rural areas, particularly, the ability of NBP to meet the needs for basic telephony and broadband services together making AFL USO obsolete in such areas where NBP infrastructure is deployed.

- Magnet agrees on the current services provided within the AFL USO. However, Magnet believes that the current FIA data-rate is not enough to meet nowadays' customers' needs and should therefore be increased to 2 Mbps minimum (extending the scope of AFL USO to broadband) without the RAT being increased.

- The regional authority Udaras na Gaeltachta expressed the need to include broadband within the scope of AFL USO in order to safeguard the economic development that has incurred in peripheral areas including Gaeltachta areas and to ensure that broadband service are provided in affordable conditions.
- Particularly, Udaras na Gaeltachta, claims for the need to set up a clear definition of what is meant by FIA, considering the current data-rate for FIA in Ireland (28.8 kbps) is not sufficient to enable optimal functional internet. Based on its consultation with local client enterprises, the regional authority proposes to upgrade FIA data-rate to 10 Mbps at least.

- UPC thinks that it is not appropriate to change the current FIA legislation, and particularly UPC does not agree with the need to include broadband within the scope of USO. UPC believes there are a number of initiatives already underway in the public and the private sectors (including the Government's investment in the NBP which may provide up to 30 Mbps throughout Ireland) which will dramatically improve universal service access to broadband in Ireland in the near future.

On the possibility to offer AFL USO via wireless technologies:

- ALTO had already submitted the possibility to provide AFL USO by means other than fixed network technologies, especially where the cost of the adopted solution could be less than current fixed network solutions.

- Eircom suggests the extension of the AFL USO definition to include mobile services. Eircom believes that such an extension is relevant considering that 41% of Irish households are reliant on mobile services at their fixed locations and hence they must consider that current mobile services do meet the requirements for AFL service.

- Magnet believes that the designated USP should look at alternative infrastructures that are capable of provisioning AFL USO other than the traditional PSTN copper network.

- UPC agrees with the suggestion to use the most efficient means as possible to fulfil AFL USO including, mobile networks where this entails less cost than the use of fixed technologies.

AFL prices must be affordable

- ALTO agrees with the obligation to provide AFL USO to customers with affordable prices.

- Eircom calls for specific affordability measures for vulnerable individuals with appropriate controls to minimize market distortion. Particularly, Eircom denotes that since the withdrawal of Telephone Allowance (TA[136]), an increasing churn and bad debt in the segment of vulnerable customers (elderly, pensioners, disabled persons). Eircom calls to consider alternative approaches to ensure affordability including:
  - Maintaining a retail price cap but allowing for lower prices in some geographic areas for example the Larger Exchange Area (LEA).
  - Setting up an industry affordability fund to subsidise vulnerable users, especially those formerly supported by the TA scheme and Eircom's Social Benefit Scheme.
  - Some combination of these approaches.

- Magnet agrees with ComReg on the necessity to provide affordability measures for vulnerable members of the society.

- Udaras na Gaeltachta, insists on the necessity to use AFL USO as a way to ensure a level playing field for marginal areas (including the Gaeltacht areas) that will not be covered by normal market development. AFL USO should be provided in affordable conditions.

- Where ComReg intends to maintain AFL USO, UPC agrees that the designated operator should apply common tariffs and to ensure that the services within the AFL USO scope are available at an affordable prices.

Member states can impose geographically averaged prices (GAP)

- ALTO agrees with the imposition of geographically averaged prices when provisioning AFL USO.

- Eircom calls for a review of the geographically averaged pricing obligation, given the current competition intensity imposed on Eircom and the potential emergence of differential competitive conditions across geographical areas.

[136] In 2012, the Irish government has withdrawn the Department of Social Protection's Telephone Allowance (TA) for which benefit over than 240 000 vulnerable individuals. In 2013, the TA was reduced to €9.5/month before being completely removed the next year.

- Magnet agrees with ComReg on the possibility to impose geographically average pricing.

- UPC agrees with the need to impose GAP, as the designated undertaking in charge of providing AFL USO must ensure that the services are available at affordable prices irrespective of geographic location of the customer.

Terms and conditions should be established in such a way that the subscriber is not obliged to pay for unnecessary facilities or services. Expenditure control shall be ensured and unwarranted disconnection of service avoided

- ALTO agrees with decided measures relating to expenditures control and avoidance of service disconnection.

- Eircom believes that current expenditure control measures and the obligation to avoid service disconnection should be pursued. Eircom, however, reiterated the need to review control of expenditures measures to include mandatory direct debit policy. Responding to ComReg view, Eircom believes that mandatory direct debit, as a standard industry policy, does not act as a barrier to access narrowband services and would not be prone to limit access to AFL universal service.

- Magnet agrees with current expenditures control measures terms and conditions (avoiding disconnection of service).

- UPC agrees with ComReg's views in respect to control expenditure measures, terms and conditions as well as the obligation to avoid service disconnection.

Universal service has to be delivered with the QoS defined by the NRA

- ALTO claims that the current QoS framework to provision AFL USO is not suitable with ALTO members' aspirations. In particular, ALTO proposes to tighten QoS requirements by proposing a 99% QoS target range for fault repair within 5 days and line faults per 100 lines to be less than 10.
- Eircom believes that current QoS targets are not appropriate until a complete review should be undertaken to determine the future requirements, if any, for AFL USO. Eircom calls for the need to define and implement a proportionate performance regime in the context of any future USP designation.
- QoS targets should be reviewed after deep analysis taking into account the consequence of the NBP and what would be the preferred technology solution, the outgoing roll-out of FTTC services and the impact of competition on Eircom's retail line base from a geographic perspective.

- Magnet believes that the NRA should set further more stringent QoS requirements. This more stringent QoS may be implemented on sliding scale over numerous years. Magnet proposed some examples of SLA targets including: 99% fault repair within 5 days, line faults per 100 lines to be less than 10.
- UPC claims that QoS targets should not be bound to fixed networks and specified in a technology neutral manner so as not to exclude more efficient AFL USO delivery methods (mobile technologies), which in any case, in the view of UPC, would likely out-perform the traditional PSTN network on the specified QoS metrics.

References:

[1] ComReg, The provision of telephony services under the universal service obligation- Access at Fixed Location. Submissions to consultation 14/18 (part 1)

[2] ComReg, The provision of telephony services under the universal service obligation- Access at Fixed Location. Submissions to consultation 14/18 (part 2)

[3] Eircom's responses to ComReg S13D request of the 30th October (2014).

9 Annex D: PIP targets for the year 2015

Table 18 - QoS PIP targets on installation time (1 January 2015 – 31 December 2015)

Description of Targets	Annual Performance Improvement Programme (PIP) Target 2015 (1 January - 31 December)	Annual Financial Security (€)
In-situ connections within 24 hours of request	80%	€5,000 per 0.1% deviation below PIP Target
In-situ connections within 2 weeks of request	99.5%	€4,000 per 0.1% deviation below PIP Target
In-situ connections within 2 months of request	99.8%	€5,000 per 0.1% deviation below PIP Target
All other connections within 2 weeks of request	80%	€5,000 per 0.1% deviation below PIP Target

All other connections within 4 weeks of request	85%	€5,000 per 0.1% deviation below PIP Target
All other connections within 8 weeks of request	90%	€5,000 per 0.1% deviation below PIP Target
All other connections within 13 weeks of request	95%	€5,000 per 0.1% deviation below PIP Target
All other connections within 26 weeks of request	99.8%	€5,000 per 0.1% deviation below PIP Target
Connections completed by Agreed date	94.2%	€5,000 per 0.1% deviation below PIP Target
Fault repairs completed by Agreed Date	95%	€2,500 per 0.1% deviation below PIP Target
Fault repairs completed within 2 working days	82%	See below
Fault repairs completed within 4 working days	95%	€5,000 per 0.1% deviation below PIP Target
Fault repairs completed within 5 working days	96%	€5,000 per 0.1% deviation below PIP Target
Fault repairs completed within 10 working days	99%	€2,500 per 0.1% deviation below PIP Target

Source: ComReg 14/129 (http://www.comreg.ie/_fileupload/publications/ComReg14129.pdf)

Table 19 - Penalties for non-compliance with Fault Repairs completed within 2 working days PIP target (1 January 2015 – 31 December 2015)

Fault Repairs completed within 2 working days Target	Financial Penalty per 0.1%	Aggregate Financial Penalty
75% or less	-	€2,500,000
75.1 - 76%	€50,000	€2,500,000
76.1- 77%	€50,000	€2,000,000
77.1 - 78%	€50,000	€1,500,000
78.1 - 79%	€25,000	€1,000,000
79.1 - 79.9%	€25,000	€750,000

80 - 81.9%	€25,000	€500,000

Source: ComReg 14/129
(http://www.comreg.ie/_fileupload/publications/ComReg14129.pdf)

10 Tables and figures