Commission for
Communications Regulation

Irish Communications Market

Quarterly Key Data

Explanatory Memorandum

Document No:	**14/134a**
Date:	**11 December 2014**

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Executive Summary

Following the publication of an annual market review in November 1999, ComReg's predecessor- the ODTR- published its first Quarterly Review on 22nd March 2000.

Since that date, ComReg has continued to collect primary statistical data from authorised operators on a quarterly basis, in order to both understand current trends in the Irish communications market and inform external users.

Electronic communications networks and services can be offered in Ireland without the need for a preceding licence or authorisation. Therefore, not all providers of networks and services operating in the Irish market may have provided data for this report. However the report does aim to represent at least 95% of the total market.

ComReg would like to thank operators who have submitted data to ComReg for this report and hopes to see their continued co-operation in the future. ComReg welcomes any comments or feedback on any aspect of the quarterly review process, and would be particularly interested in suggestions that may improve the accuracy of information received or that would ease the burden for operators in collecting the data.

The information and statistics contained within this document are derived from a variety of sources, but are mostly reliant on data obtained from authorised operators.

Historically, ComReg's Quarterly Reports have adopted a rigorous and exacting standard, both with regard to accuracy and completeness. This is notwithstanding the fact that occasionally, the available data is not as complete as ComReg would ideally wish it to be.

However, ComReg is intent on an ongoing basis, on improving its standards wherever possible.

ComReg intends to make on-going improvements to enhance our processes of data collection and analysis. As part of our continued enhancement of the report, where appropriate a list of corrections to data will be highlighted at the front of each Quarterly Key Data Report indicating data that has been revised since the previous report.

This memo provides data definitions for all statistics contained in the Quarterly Report as well as a glossary of technical terms used in the report. Section 1.1 Primary Data is based on data supplied to ComReg by authorised operators, while section 2.1 Secondary data uses data supplied to ComReg by additional sources, such as the European Commission and market research companies.

This memo is updated with each published Quarterly Report to reflect where data may differ from previously published reports.

All data is quarterly unless otherwise stated. When year-on-year comparisons are made, this indicates that data in the current quarter (i.e. a 3 month period) is compared with the same quarter in the previous year.

In most cases data has been rounded to one decimal place in this report.

Extracts of data used in this report can be downloaded at www.comstat.ie

Primary Data

Figure/ Section	Indicator	Definition
1.1.1	**Total Number of Authorisations**	Total number of authorisations issued at the date of publication by ComReg to fixed, mobile and broadcasting operators.
1.2.1	**Fixed, Mobile and Broadcasting as a % of Total Retail Revenues**	The share of total retail revenue generated by the provision of retail fixed voice and data services, retail mobile voice and data services as well as retail cable and MMDS broadcasting services
1.3.1	**Share of Total voice Call Volumes (minutes)**	Overall total volumes or minutes of basic and advanced voice calls made over both fixed and mobile public voice networks, broken down by call type and expressed as a percentage share of the total volume. Fixed Advanced minutes include calls via payphones. Mobile roaming calls made by visitors while in Ireland are excluded from the analysis, as analysis is based on usage by domestic customers only of fixed and mobile networks, i.e. those customers whose current residence is in Ireland
1.3.2	**Total Voice Traffic**	This table quantifies the total volume of voice calls originating (or initiated) from fixed (PSTN/ISDN, VoB) networks and from mobile networks.
1.5.1	**Total Subscriptions (Fixed and Mobile)**	This chart shows the total number of fixed and mobile retail subscriptions in Ireland.
2.1.1	**Profile of Fixed Line Retail Revenues**	Breakdown in % terms of share of total revenue generated by the direct[1] and indirect[2] provision of retail fixed voice and data services, among a specific set of sub-categories: • retail fixed voice services (such as PSTN voice services and dial-up Internet services. This category also includes revenues from voice over broadband services.), • retail broadband services (This category also includes revenues from WiFi services); • retail revenues from leased lines and managed data services including web-hosting, directory publication & other services.
2.1.1.1	**Fixed Retail Revenue Market Shares**	This chart shows the fixed line retail revenue market share for operators who have 2.0% or more revenues market share. Includes revenues from the provision of retail fixed voice services, retail broadband services and retail leased line, managed data, and other ancillary services including web-hosting, directory publication and other services.
2.1.1.2	**Fixed Revenue Market Shares**	This chart shows the fixed line retail and wholesale revenue market share for operators who have 2.0% or more revenues market share. Includes revenues from the provision of interconnection, wholesale fixed narrowband access, wholesale broadband access, wholesale leased lines and managed data services (including revenues from Partial Private Circuits), retail fixed voice services, retail broadband services and retail leased line, managed data, and other ancillary services including web-hosting, directory publication and other services.

[1] Provided to customer over their supplier's own network infrastructure and/or by means of unbundled local loops

[2] Provided to customer by means of their supplier's wholesale access to another operator's network infrastructure

Figure/ Section	Indicator	Definition
2.2.1.1	**Narrowband Fixed Access Paths**	This table quantifies the total number of direct[3] and indirect[4] fixed narrowband (data rates less than 144k) telephone lines, i.e. lines connecting the subscriber's terminal equipment to the public switched network and which have a dedicated port in the telephone exchange equipment. The growth rates are for quarterly and year-on-year growth in subscription numbers across each form of narrowband access. There is a one-to-one relationship between PSTN lines and access paths, i.e. one PSTN access path is equal to one line. ISDN lines can be separated by type: Basic, Fractional and Primary Rate. For basic rate ISDN line, each line is capable of carrying 2 access paths; for fractional rate ISDN, each line can carry up to 16 access paths; for primary rate ISDN, each line can carry up to 30 access paths. Therefore total fixed access paths are based on the number of PSTN lines plus the appropriate multiplier applied to the number of installed ISDN lines. These narrowband access paths are used to deliver voice telephony and/or dial-up internet access to subscribers.
2.2.1.2	**Direct and Indirect Narrowband Fixed Access Paths**	The percentage split of Direct and Indirect Narrowband Fixed Access Paths.
2.2.2	**Narrowband Indirect Access Paths**	Total number of indirect[5] fixed narrowband (data rates less than 144k) telephone paths provided to customers by means of carrier pre-select only, wholesale line rental or White Label Access over PSTN or ISDN lines. Carrier pre-select allows the user to receive all or a portion of calls from one provider and line rental from a second provider (usually *eircom*). Wholesale line rental (also known as single billing) allows the user to receive every aspect of telephone service, including all calls and line rental from an alternative operator other than the incumbent operator, Eircom. White Label Access-Voice Access (WLA-(Voice)) is a switchless voice service which allows an operator to purchase end-to-end call services without the need to have its own interconnection infrastructure.
2.2.3	**Fixed voice subscriptions**	This chart shows the total number of fixed voice subscriptions (either standalone or part of a bundle) and the fixed voice subscriptions market share for operators who have 2.0% or more subscriptions market share.
2.2.4	**Fixed Market Retail Subscriptions by Type**	This chart shows the percentage of subscriptions by type. Subscriptions mean a customer with at least one contract with an electronic communications service provider. Bundled subscriptions are subscriptions of a single operator who receive two or more services such as fixed and mobile telephony service, access to TV programmes and broadband internet access from that single operator, usually for a single price and as part of a single bill.

[3] See note 1 above

[4] See note 2 above

[5] See note 2 above

Figure/ Section	Indicator	Definition
2.3.1, 2.3.2 and 2.3.3	**Fixed Voice Call Volumes (minutes)**	Total number of retail minutes or traffic generated by means of fixed voice calls both direct[6] and indirect[7] Call volumes are broken down into domestic (including calls to Northern Ireland), international outgoing calls, calls to mobile and other/advanced minutes. The split of VoB minutes by category (i.e. domestic, international, mobile, other) has been placed into those respective categories. In figures 2.3.2 and 2.3.3 monthly business and residential traffic for each category of calls is divided by the number of business and residential subscriptions to fixed voice services respectively.
2.4.1	**Fixed Numbers Ported**	Total number of fixed numbers which have been retained by customers when they switched from one mobile operator to another. A total for each quarter is charted.
3.1.1	**Total Number of Active Internet Subscriptions in Ireland**	This table quantifies the number of subscriptions (both residential and business) with either narrowband or broadband internet access. The growth rates are for quarterly and year-on-year growth in subscription numbers across each form of internet access. A narrowband internet subscription is considered active if it has been accessed in the last 60 days of the quarter. DSL broadband subscribers use the conventional copper PSTN line for high-speed broadband access. DSL services are usually "always-on", i.e. the user does not have to initiate the Internet connection to access the internet. Some providers also offer time-based broadband services, i.e. the user pays for a limited amount of hours of broadband access per month. Other broadband subscribers use high-speed broadband services over platforms other than DSL (i.e. the copper network) such as fixed wireless access, VDSL (very-high-bit-rate digital subscriber line), cable modem fibre, satellite and mobile broadband using HSDPA. One subscriber may have more than one internet subscription.
3.1.2	**Total Broadband Subscriptions**	This chart shows the trend in fixed and mobile broadband internet subscriptions over the last 2 years.
3.1.3	**Quarterly Growth in Total Broadband Subscriptions**	This chart shows the quarterly growth rate in broadband subscriptions over time**.**
3.1.4	**Broadband Subscriptions by Platform**	Total number of broadband subscriptions (both residential and business customers) by means of DSL, VDSL, cable modem, fibre, satellite, fixed wireless access and/or mobile broadband. Cable modems allow internet broadband access by means of cable TV connections. Fixed wireless access allows internet broadband access by means of wireless devices or systems located in fixed locations, such as homes and offices. Mobile broadband allows users to access the Internet both at a fixed location and while on the move by means of a data card or USB dongle attached to a laptop.
3.1.5	**Broadband Subscriptions – Net additions**	This chart shows the net additions of each broadband platform to total broadband over the last year.
3.1.6	**Broadband Subscriptions by Subscription Type**	This chart breaks out the proportions of total broadband subscriptions, and on specific broadband platforms such as cable modem and fixed wireless access, by business

[6] See note 1 above

[7] See note 2 above

Figure/ Section	Indicator	Definition
		and residential segments of the market. Some of this data is based on estimates.
3.1.7	**Fixed Broadband Subscriptions by Contracted Download Speeds and Subscription Type**	This chart provides an indication of the percentage of total residential and total business fixed broadband subscriptions split by categories of contracted (i.e. speed specified in the contract with the ISP as distinct from actual download speeds delivered by the ISP) download speeds.
3.1.8	**Fixed Broadband Subscriptions by Contracted Download Speeds and Broadband Platform**	This chart provides an indication of the percentage of total residential and total business fixed broadband subscriptions split by categories of contracted (i.e. speed specified in the contract with the ISP as distinct from actual download speeds delivered by the ISP) download speeds by each broadband platform.
3.1.9	**Fixed Broadband Subscriptions by Contracted Download Speeds**	This chart shows total fixed broadband lines by contracted download speeds over the last year.
3.1.10	**Subscription Market Share of the Fixed Broadband Market**	This chart shows the percentage market share of the fixed broadband market by operators with at least 2% market share.
3.1.11	**Subscription Market Share of the Mobile Broadband Market**	This chart shows the percentage market share of mobile broadband subscriptions in Ireland.
3.2.1	**Provision of DSL Access**	Proportions of Digital Subscriber lines (DSL) supplied to customers by means of direct retail supply by Eircom, and wholesale supply by eircom to other operators by means of fully unbundled lines or bitstream.[8] DSL (Digital Subscriber Line) is a technology for bringing high-bandwidth or broadband information to homes and small businesses over ordinary copper telephone lines.
3.2.2	**Number of Local Loops Unbundled**	This chart shows the total number of copper lines which have been unbundled by alternative operators and also shows the split between shared lines and those lines which have been fully unbundled. The local loop is the physical path, usually copper, which connects a local exchange to an end user. When availing of LLU, an operator has the option to rent either the entire loop ("full unbundling"), or, alternatively, to rent only the high capacity frequencies within the loop which are then used to provide broadband services ("LLU Line Share").
3.5.1	**WiFi hotspots, access points and Minutes of Use**	This table lists the number of WiFi hotspots, access points in Ireland and usage volumes of these access points (expressed in total minutes) at the end of the reporting period. Hotspots are typically public locations at which broadband internet access can be obtained. At these hotspots, users with a computer (usually a laptop) can wirelessly connect to the internet either for free or on payment of a fee. Typical locations for such hotspots include cafes and restaurants, hotels and airports. In general terms, more than one access point can be found at a hotspot. Minutes of use are used to express usage as most WiFi users access or purchase WiFi networks on the basis of dedicated time-delimited sessions.

[8] Bitstream access refers to the situation where the incumbent installs a high-speed access link to the customer premises and then makes this access link available to third parties, to enable them to provide high-speed services to customers. Bitstream depends in part on the PSTN and may include other networks such as the ATM network, bitstream access is a wholesale product that consists of the provision of transmission capacity in such a way as to allow new entrants to offer their own, value-added services to their clients. The incumbent may also provide transmission services to its competitor, to carry traffic to a 'higher' level in the network hierarchy where new entrants may already have a broadband point of presence.

Figure/ Section	Indicator	Definition
4.1.1	**Mobile subscriptions**	This chart shows the total number of mobile phone subscriptions (both contract and prepaid) inclusive of and exclusive of mobile broadband subscriptions in Ireland. A prepaid subscriber refers to an active prepaid subscriber – i.e. those who have made an event that decrements their balance in the previous 90 days such as a pre-paid top up, outgoing call, SMS, MMS or mobile internet usage. A contract customer refers to a customer with a current contract subscription. This chart provides separate lines for mobile subscriptions with and without mobile broadband datacards, USB modems and Machine to Machine subscriptions.
4.1.2	**Mobile subscribers using data services over 3G/4G networks**	This table shows mobile subscriptions broken down by 3G/4G SIMs and type.
4.1.3	**Irish Mobile Penetration Rate**	Total number of mobile phone, data-card (GSM/2G, 3G/HSDPA and 4G LTE, both contract and prepaid) and M2M subscriptions in Ireland as measured by the total number of active SIM cards, 3G/4G data cards and USB modems divided by the total population and multiplied by 100. A prepaid subscriber refers to an active prepaid subscriber – i.e. those who have made an event that decrements their balance in the previous 90 days such as a pre-paid top up, outgoing call, SMS, MMS or mobile internet usage. A contract customer refers to a customer with a current contract subscription. This chart provides separate lines for mobile subscriptions with and without mobile broadband data cards and USB modems.
4.2.1	**Profile of Pre-paid and Post-paid Subscriptions**	This chart shows the proportion of pre-paid and post-paid mobile subscriptions (including mobile broadband and M2M) over the last year.
4.2.2	**Mobile subscriptions by pre-pay / post-pay split**	This chart shows the absolute numbers of mobile subscriptions split by pre and post pay type over time.
4.2.3	**Profile of Pre-paid and Post-paid Subscriptions by Operator**	Percentages of total number of mobile phone, data-card (GSM/2G, 3G/HSDPA and 4G/LTE) and M2M subscriptions to each of the mobile service providers, broken down by pre-paid and post-paid (contract) packages
4.2.4	**Profile of Pre-paid and Post-paid mobile Broadband Subscriptions**	This figure shows the split between pre-paid and post-paid mobile broadband subscriptions.
4.2.5	**Post-paid Business and Residential Mobile Subscriptions**	This table shows the split between post-paid business and residential mobile subscriptions.
4.2.6	**Mobile Subscriptions by Network Used**	This figure shows the split of mobile subscribers (including mobile broadband and M2M subscribers) broken down by network used by these subscribers. For example, subscribers who purchase 4G plans and have generated traffic on a 4G network are categorised as 4G subscribers. Categories are mutually exclusive in that subscribers who have generated traffic on multiple networks (e.g. 2G and 3G) are categorised as users of the higher quality network (3G in this example).
4.3.1	**SMS, MMS, Other Data and Call Minute Volumes**	Total volumes of mobile voice (calls), messages (both SMS and MMS)[9] and data usage (both downloads and uploads) made over mobile networks on a quarterly basis.
4.3.2	**Voice Call Minute Volumes by Type**	This chart shows mobile voice minutes by category – mobile to mobile, mobile to fixed, mobile international / roaming and mobile advanced minutes.
4.3.3	**Mobile to Mobile Voice**	This chart shows the number of on-net and off-net

[9] SMS – Short Messaging Service; MMS = Multimedia Messaging Service

Figure/ Section	Indicator	Definition
	Call Volumes by Type	minutes made over mobile networks over the last year.
4.3.4	**Monthly Mobile Voice Call Minutes per Subscriber by Type**	Monthly mobile traffic for each category of calls is divided by the total number of mobile subscribers (mobile broadband subscriptions are excluded).
4.3.5	**Monthly Mobile Messaging and Data Volumes per Subscription**	Monthly mobile messaging is divided by the total number of mobile subscribers (mobile broadband subscriptions are excluded). Monthly data traffic from smarthphones is divided by the number of smartphones. Monthly data traffic from dedicated mobile broadband subscriptions is divided by the number of dedicated mobile broadband subscribes.
4.4.1	**Total Mobile Retail Revenues**	Total aggregate retail revenues generated by mobile network operators, split between voice, messaging and data services. Revenues from interconnection and mobile termination are not included as they are considered to be wholesale revenue streams. Revenues from mobile broadband services are included under data revenues.
4.5.1	**Monthly Average Revenue per User by Type**	Weighted Average Revenue per User based on the estimates provided by operators.
4.6.1	**Market Share – Number of Business Subscriptions/Number of M2M Subscriptions**	This chart shows the percentage market share of Business subscriptions (including mobile broadband and M2M subscriptions) as well as percentage market share of Machine to Machine subscriptions in Ireland.
4.7.1	**Market share – Number of Subscriptions (incl. Mobile Broadband)**	Each mobile operator's share of the total number of mobile subscriptions (GSM/2G Sims, 3G/HSDPA Sims and 4G/LTE datacards and modems), expressed as a percentage.
4.7.2	**Market share – Number of Subscriptions (excl. Mobile Broadband)**	Each mobile operator's share of the total number of mobile subscriptions (GSM/2G, 3G/HSDPA and 4G/LTE Sims) expressed as a percentage. HSDPA data cards and modems are excluded from data in this chart.
4.7.3	**Mobile Revenue Market Share**	Mobile operators' shares of total mobile retail revenues (GSM/2G, 3G/HSDPA and 4G/LTE), expressed as a percentage of total mobile retail revenues.
4.8.1	**Gross Subscription Additions and Numbers Ported**	Total number of gross additions and a number of mobile numbers which have been retained by customers when they switched from one mobile operator to another.

Secondary data

Pricing data

Sections 2.5, 3.6 and 4.9 contain comparative pricing data which is based on pricing analysis information supplied by Strategy Analytics (Teligen).

The pricing data is based on prices publicly advertised on operators' websites during Q3 2014.

An OECD-approved methodology is adopted by Strategy Analytics to compare fixed and mobile tariffs. This format follows a basic three-step process consisting of: (i) the construction of one or more baskets of telecommunications services; (ii) the estimated price of using those baskets; and (iii) the conversion of the individual currencies to standard units (e.g. US dollar with Purchasing Power Parities (PPPs)) when making international comparisons. Appendix A of this Quarterly Key Data Report Memorandum provides more detail on the base rates used to calculate PPPs in the OECD tariff baskets.

Fixed voice pricing analysis

The advertised price of each fixed voice tariff is examined and the total average monthly price of the product is calculated based on the four elements identified below, where applicable:

- Fixed charges: charges including non-recurring charges such as connection charges and monthly recurring charges (including line rental). Non-recurring charges are discounted over a five year period. i.e., a contribution to the monthly total cost equals the total non-recurring charges divided by 60. The full amount of monthly recurring charges is included in the total average monthly cost. Where any short term promotional discounts are applied to monthly charges, these are accounted for by calculating an average monthly cost over a five year period.
- Charges for calls to national fixed telephone networks: the full amount of such charges are included in the monthly cost (charges applied to calls exceeding any inclusive monthly calls allowance, where applicable)
- Charges for calls to national mobile telephone networks: the full amount of such charges are included in the monthly cost (charges applied to calls exceeding any inclusive monthly calls allowance, where applicable)
- Charges for international calls[10]: the full amount of such charges are included in the monthly cost (charges applied to calls exceeding any inclusive monthly calls allowance, where applicable)

Having regard to the above treatment, the total average monthly cost equals the sum of, fixed charges, plus any additional charges for calls to fixed networks, mobile networks and international calls (as applicable).

Fixed broadband pricing analysis

The advertised price of each broadband tariff is examined and the total average monthly price of the product is calculated based on the three elements identified below, where applicable:

- Non-recurring charges: These include one-off charges such as installation costs, service connection charges, equipment charges (such as modem/router charges). These non-recurring charges are discounted over a three year period. i.e., a contribution to the monthly total cost equals the total non-recurring charges divided by 36.
- Recurring monthly charges (including line rental, where applicable): the full amount of such charges is included in the total average monthly cost. Where any

[10] See Table 15 below for the assumed distribution of international calls which is applied to each fixed voice tariff.

short term promotional discounts are applied to monthly charges, these are accounted for by calculating an average monthly cost over a three year period.

- Usage charges: the full amount of such charges are included in the monthly cost (charges applied to data usage exceeding any inclusive monthly data allowance, where applicable).

Having regard to the above treatment, the total average monthly cost equals the sum of, non-recurring charges, plus recurring monthly charges, plus usage charges (as applicable).

Mobile broadband pricing analysis

The advertised price of each broadband tariff is examined and the total average monthly price of the product is calculated based on the three elements identified below, where applicable:

- Non-recurring charges: These include one-off charges such as service connection and one-off SIM cost, device costs (where applicable).These charges are discounted over a three year period. i.e., a contribution to the monthly total cost equals the total non-recurring charges divided by 36.
- Recurring monthly charges[11]: the full amount of such charges is included in the total average monthly cost. Where any short term promotional discounts are applied to monthly charges, these are accounted for by calculating an average monthly cost over a three year period.
- Usage charges: the full amount of such charges are included in the monthly cost (charges applied to data usage exceeding any inclusive monthly data allowance, where applicable).

Having regard to the above treatment, the total average monthly cost equals the sum of, non-recurring charges, plus recurring monthly charges, plus usage charges (as applicable).

Mobile pricing analysis

The advertised price of each mobile voice and data tariff is examined and the total average monthly price of the product is calculated based on the three elements identified below, where applicable:

- Fixed charges: charges including non-recurring charges such as connection charges and monthly recurring charges (including line rental). Non-recurring charges are discounted over a three year period. i.e., a contribution to the monthly total cost equals the total non-recurring charges divided by 36. The full amount of monthly recurring charges is included in the total average monthly cost. Where any short term promotional discounts are applied to monthly charges, these are accounted for by calculating an average monthly cost over a three year period. Mandatory monthly top ups are treated as fixed charges.
- Charges for voice calls (including calls to national fixed networks): the full amount of such charges are included in the monthly cost (charges applied to calls exceeding any inclusive monthly calls allowance, where applicable). Top up charges for pre-paid tariffs (excluding mandatory monthly top ups) are categorised as voice calls charges.
- Charges for SMS: the full amount of such charges are included in the monthly cost (charges applied to SMS usage exceeding any inclusive monthly SMS allowance, where applicable).
- Charges for data usage: the full amount of such charges are included in the monthly cost (charges applied to data usage exceeding any inclusive monthly data allowance, where applicable)

[11] If pre-paid tariff mandates mandatory monthly top-ups, the top up charge will be categorised as monthly recurring charge. Otherwise, top up charges are treated as usage charges.

Having regard to the above treatment, the total average monthly cost equals the sum of, fixed charges, plus any additional charges for voice calls, SMS and data usage (as applicable).

Further detail of the fixed voice, fixed broadband, mobile broadband and mobile baskets are provided in appendix B of this document.

Other data

Figure/ Section	Indicator	Definition
1.4.1	**Consumer Price Index and Communications Sub-Component**	This chart shows the annual percentage change in the consumer price index and its communications sub-component overtime.
3.4.1	**Broadband Subscriptions per Capita**	Fixed broadband subscriptions per capita based on data sourced from Analysys Mason.
3.4.2	**Household Broadband Subscriptions**	Fixed and mobile household broadband subscriptions based on data sourced from the EU Digital Agenda Scoreboard.
3.4.3	**Household Broadband Penetration**	Fixed and mobile household broadband penetration based on data sourced from the EU Digital Agenda Scoreboard.
5.1.1	**TV Homes by Reception Type**	This table shows total TV homes by reception type which is determined by the TV channels a household receives.
5.1.2	**TV Homes by Reception Method**	This chart shows the percentage of TV homes by the method by which the homes receive their channels. Each home can have more than one method of reception. e.g. aerial and cable or Sky, Sky and cable, etc. The question is asked for their main and up to 9 TV sets. For this reason, the total for the reception methods adds up to more than 100%.
5.1.3	**TV Homes**	This chart shows the total number of TV homes in Ireland over time, including a break out of digital TV homes and multi total TV homes.
5.1.4	**DVD, Broadband, Games Console and PVR Trends**	This chart shows the trend in household DVD, broadband access, games console and PVR ownership over time (PVR is an electronic device used to record media digitally. This is a generic term, and can be used to describe portable media players, stand-alone units, and combination units. The PVR is also known as the digital video recorder or DVR).
5.1.5	**Pay TV vs Free to Air TV Homes**	This chart shows the proportion of pay TV (cable/IPTV/satellite) homes and free to air TV homes, based on reception method.
5.1.6	**Digital and Analogue TV Reception**	This data is based on the type of channels received in a TV home, showing the change over time between analogue reception and digital reception.

Glossary

Access Line	Access Line means a connection from the Network Termination Point to the entry point to the local switch or remote concentrator, whichever is nearer. In many cases this is the main distribution frame.
ADSL	Asymmetric Digital Subscriber Line: Utilises a technology that transforms a normal telephone line into a high-speed digital line that enables access to telephony services and the Internet at the same time. ADSL provides always-on access to Internet or TV and Video on-demand services at speeds that are 10 to 40 times faster than a standard 56k modem. An ADSL line has a higher downstream speed (into the end user) than upstream speed (away from the end user).
Analogue	The direct representation of a waveform, as opposed to digital which is a coded representation. An analogue signal is one that varies continuously (eg. Sound waves). Analogue signals vary along two parameters, amplitude (strength) and frequency (tone). The unit of measurement is the Hertz, or cycle per second.
ATM	Asynchronous Transfer Mode – the internationally agreed basis for broadband ISDN. A technology that enables all types of information (data, voice and video in any combination) to be transported by a single network infrastructure.
ARPM	Average Revenue Per Minute- Average Revenue Per Minute generated by mobile customers, bob prepaid and post-paid, based on usage of voice services only. Revenues from data usage such as SMS and MMS are not included.
ARPU	Average Revenue Per User- A measure of the average revenue generated per subscriber over a specific time period; ARPU in this report is calculated on a monthly basis.
Bandwidth	The physical characteristic of a telecommunications system that indicates the speed at which information can be transferred. In analogue systems, it is measured in cycles per second (Hertz) and in digital systems in binary bits per second. (Bit/s).
Bits per second	Basic unit of measurement for serial data transmission capacity; abbreviated as K bps, or kilobit/s for thousands of bits per second; M bps or megabit/s for millions of bits per second; G bps, or gigabit/s for billions of bits per second; T bps or terabit/s or trillions of bits per second.
Broadband	Broadband access is defined as speeds of 144kbit/s or greater. Active broadband lines or subscriptions are required based on their maximum download speed as advertised by the provider.
Cable Modem	A cable modem is a device that enables a PC to be linked to a local cable TV line for internet/data services.
Calling Line Identity (CLI)	A facility that enables identification of the number from which a call is being made.
Carrier Pre-selection (CPS)	Carrier Pre Selection is the wholesale product offered to other authorised operators which facilitates them to offer their retail customers certain defined classes of calls to be carried by that operator. These calls are selected in advance based on a contract with the customer, without the customer having to dial a routing prefix or follow any other different procedure to invoke such routing.
Co-location	The provision of space for a customer's telecommunications equipment on the service provider's premises.
Dial-up	Connections made to a data network using the switched network to provide a voice band or data bearer.
Digital	The coded representation of a waveform by, for example, binary digits in the form of pulses of light, as opposed to analogue which is the direct representation of a waveform.
Digital Audio Broadcasting (DAB)	Digital audio broadcasting (DAB), also known as digital radio and high-definition radio, is audio broadcasting in which analogue audio is converted into a digital signal and transmitted on an assigned channel in the AM or (more usually) FM frequency range.
Digital Subscriber Line (DSL)	A family of technologies generically referred to as DSL or xDSL, which are capable of transforming a normal telephone line into a high-speed digital line. These include ADSL (Asymmetric DSL), SDSL (Symmetric DSL), HDSL (High data rate DSL) and VDSL (Very high data rate DSL). DSL enabled lines are capable of supporting services such as

	fast Internet access and video or TV on-demand.
Digital Terrestrial Television (DTT)	Digital television broadcast entirely over earthbound circuits. DTT signals are broadcast over essentially the same media as the older analogue terrestrial TV signals. DTT provides a clearer picture and superior sound quality when compared to analogue TV, with less interference and offers far more channels, thus providing the viewer with a greater variety of programmes.
Direct Access	The situation where a customer is directly connected to a telecommunications operator by a wire, fibre-optic or radio link to connect that customer to the public telecommunication network.
Directory Enquiry Service (DQ)	Directory information service which is operator assisted and involves the operator looking up entries on a database.
Ethernet Leased Lines	Leased Lines delivered with an interface defined under standard IEEE 802.3 is the OSI Model Layer 2 "Data Link Media Layer" or TCP/IP Model Layer 2, Data Link (Network Interface) layer and describes the Ethernet interface standard now adopted as a method for connecting equipment/networks to "Wide Area Networks". The physical media can be wireless, copper or fibre.
Fibre Optic Cable	A transmission medium that uses glass or plastic fibres rather than copper wire to transport data or voice signals. The signal is imposed on the fibres via pulses (modulation) of light from a laser or a light-emitting diode (LED). Because of its high bandwidth and lack of susceptibility of interference, fibre-optic cable is used in long-haul or noisy applications.
Fixed Mobile Convergence (FMC)	FMC is a development of the concept of convergence in the telecommunications sector that covers the coming together of fixed telecommunications, including fixed cellular such as Wi-Fi and pure cellular
Fixed telephone Services	Means the provision to end-users at fixed locations of a service for the originating and receiving of national and international calls, including voice telephony services and may include, in addition, access to emergency 112 services, the provision of operator assistance, directory services, provision of public pay telephones, provision of service under special terms or provision of special facilities for customers with disabilities or with special social needs but does not include value added services provided over the public telephone system.
Flat Rate Internet Access (FRIACO)	The provision of a Flat Rate Internet Access Call Origination via a wholesale un-metered Internet access product.
Fixed Wireless Access (FWA)	A system that connects subscribers to the public switched telephone network (PSTN) using radio signals as a substitute for copper wires for all or part of the connection between the subscriber and the switch.
FTTx	FTTx is the installation and use of optical fibre from a central point directly to individual buildings such as houses, apartment buildings or businesses to provide high-speed Internet access or services such as TV or voice telephony. FTTx refers to a range of fibre access installations such as fibre to the home (FTTH), fibre to the curb (FTTC) and fibre to the premises (FTTP).
Global System for Mobile Communications (GSM)	A second generation digital mobile technology. Initially developed for operation in the 900MHz band and subsequently modified for the 850, 1800 and 1900MHz bands. GSM originally stood for Groupe Speciale Mobile, the CEPT committee which began the GSM standardisation process.
High Speed Data Packet Access (HSDPA)	HSDPA (High-Speed Downlink Packet Access) is a packet-based mobile telephony protocol used in 3G UMTS radio networks to increase data capacity and speed up transfer rates. HSPDA specifies data transfer speeds of up to 14.4 Mbps per cell for downloads and 2 Mbps per cell for uploads.
ICT	Information & Communications Technologies
Indirect Access	Where a customer's call is routed and billed through operator A's network even though the call originated from the network of operator B. It is the generic term for both easy access and equal access.
Integrated Services Digital Network (ISDN)	A network based on the existing digital PSTN which provides digital links to customers and end to end digital connectivity between them. ISDN2 provides a maximum bandwidth of 128kbit/s.
ISDN BRA	Means Integrated Services Digital Network, Basic Rate Access.
ISDN PRA	Means Integrated Services Digital Network, Primary Rate Access
Interconnection	Services provided by one telecommunications organisation to another

services	for the purpose of the conveyance of messages and information between the two systems and including any ancillary services necessary for the provision and maintenance of such services.
Internet protocol (IP)	Packet data protocol used for routing and carriage of messages across the internet.
Internet telephony	A specific type of unmanaged VoIP service that uses the public Internet to carry the IP traffic (also referred to as Voice over the Internet).
ISP	Internet Service Provider
Leased line	The term "leased lines" refers to fixed, permanent telecommunications connections providing symmetric or near symmetric capacity between two points. A leased line is permanent, in that capacity is available between the two fixed points, although capacity could be reserved or shared through the associated network depending on the nature of the leased line. Provision of the service is "technology neutral" and can be provided over either wired or wireless media and data for both should be provided. N.B. the national portion of international leased lines should be included in the figures supplied in all cases. The national access portion connecting a customer site to an operator international switching centre or node would count as an access line and an associated value ascribed to it.
Local Loop	The access network connection between a customer's premises and the local exchange. This usually takes the form of a pair of copper wires.
Local Loop unbundling (LLU)	LLU was mandated by the EU in December 2000. It requires those operators designated as having significant market power) to make their local networks (i.e. the telephone lines that run from a customer's premises to the local telephone exchange) available to other telecommunications companies on a wholesale basis.
Long Term Evolution (LTE)	LTE is a standard for wireless communication of high-speed data for mobile phones and data terminals. Often called Fourth Generation Cellular Network, but still on the GSM/EDGE and UMTS/HSPA network technologies, increasing the capacity and speed using a different radio interface together with core network improvements
Machine to Machine (M2M)	Machine to Machine (M2M) refers to technologies that involve data communication between devices or systems in which, at least in principle, human intervention is not a part. These technologies may encompass either wireless or wired communications, or both.
Managed services	Managed services include fully outsourced network management arrangements, including advanced features like IP telephony, messaging and call centre, virtual private network (VPNs), managed firewalls, and monitoring/reporting of network servers. Most of these services can be performed from outside a company's internal network.
Mobile Number Portability (MNP)	The facility which allows mobile subscribers to retain their mobile number when moving between mobile networks e.g. a customer with an 083, 085, 086 or 087 mobile number can be an active subscriber on the network of their choice with their current number.
Modem	A device which converts digital signals from a data-transmitting terminal into modulated analogue signals which can be carried by a public telephone network.
Multimedia messaging Service (MMS)	A communications technology developed by 3GPP (Third Generation Partnership Project) that allows users to exchange multimedia communications such as pictures between capable mobile phones and other devices. MMS is an extension to the Short Message Service (SMS) protocol.
Multipoint Microwave Distribution System (MMDS)	Multipoint Microwave Distribution System (MMDS) is a system to allow for the distribution of multi-channel television. This is a subscriber-based system which operates in the microwave part of the band (2GHz – 3 GHz). Reception of MMDS is typically through a roof-top microwave antenna and set-top box.
Narrowband	A service or connection allowing only a limited amount of information to be conveyed, such as for telephony. This compares with broadband which allows a considerable amount of information to be conveyed.
Network Termination Point	Means the physical point at which a subscriber is provided with access to a public communications network; in the case of networks involving switching or routing, the network termination point is

	identified by means of a specific network address, which may be linked to a customer number or name.
Originating network	The network to which a caller who makes a call is directly connected.
Other Authorised Operators (OAOs)	OAO means a legal entity other than eircom which is designated under Section 4 (1) of the European Communities (Electronic Communications Network and Services) (Authorisation) Regulations 2003 (S.I N0.306 of 2003), to provide an electronic communications network or service.
Partial private Circuit (PPC)	A type of wholesale leased line that allows OAOs to efficiently combine their network infrastructure with capacity provided by the incumbent.
Path	A path is a route between any two points or nodes.
Premium rate services (PRS)	Services, including recorded information and live conversation, run by independent service providers. All calls to these companies are charged at a higher rate than ordinary calls to cover the companies' costs in providing the content of the call and the operator's cost for the special network facilities needed.
Private circuits	Point-to-point circuits for customers exclusive use covering speech, data or image communications.
Public switched telephone network (PSTN)	A voice-oriented public telephone network. Also known as the Plain Old Telephone Service (POTS).
Public telecommunications network	A telecommunications network used, in whole or in part, for the provision of publicly available telecommunications services.
Purchasing Power Parities (PPPs)	Purchasing Power Parities (PPPs) are currency conversion rates that both convert to a common currency and equalise the purchasing power of different currencies. In other words, they eliminate the differences in price levels between countries in the process of conversion.
Resellers	Service Providers who do not have their own network.
RFID	RFID (radio frequency identification) is a technology that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency (RF) portion of the electromagnetic spectrum to uniquely identify an object, animal, or person.
Roaming	A service unique to GSM which enables a subscriber to make and receive calls when outside the service area of his home network e.g. when travelling abroad.
Short message service (SMS)	A service for sending messages of up to 160 characters (224 characters if using a 5-bit mode) to mobile phones that use Global System for Mobile (GSM) communication.
Spectrum	The range of wavelengths used, for example, for broadcasting radio, terrestrial television and satellite television. Usable wavelength ranges from about 100 KHz to about 400 GHz although there are as yet no broadcasts above about 12 GHz.
Subscriber Identity Module (SIM)	A smart card containing the telephone number of the subscriber, encoded network identification details, the PIN and other user data such as the phone book. A user's SIM card can be moved from phone to phone as it contains all the key information required to activate the phone.
Switch	Relates to a telecommunications network comprising at least one exchange and capable of routing signals and messages from one line to all other lines comprised in the network.
Telecommunications	Conveyance of speech, music and other sounds, visual images or signals by electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical means.
Terminating network	The network to which a caller who receives a call is directly connected.
Third generation mobile systems (3G)	A European 3G mobile communications system provides an enhanced range of multimedia services (e.g. high speed Internet access).
Transit	A transit service is a conveyance service provided by a network between two points of interconnection. It is therefore a service that links two networks that are not in themselves interconnected.
Trunk network	A trunk network that connects major switching centres or nodes in a communications system
Very-high-bit-rate digital subscriber line (VDSL)	VDSL is a DSL technology providing data transmission faster than ADSL over a single flat untwisted or twisted pair of copper wires (up to 52 Mbit/s downstream and 16 Mbit/s upstream), and

	on coaxial cable (up to 85 Mbit/s down- and upstream) using the frequency band from 25 kHz to 12 MHz. These rates mean that VDSL is capable of supporting applications such as high-definition television, as well as telephone services (voice over IP) and general Internet access, over a single connection. VDSL is deployed over existing wiring used for analogue telephone service and lower-speed DSL connections.
Voice over Broadband (VoB)	IP-based services that facilitate voice calls to and/or from the PSTN over a broadband connection. With this service, the customer may either have broadband access from an ISP and acquire voice over broadband services from a separate entity, or have both broadband and voice over broadband services bundled together by the same supplier. Voice services bundled with digital TV services and delivered over digital cable TV networks should also be recorded here.
Voice telephony service	A service available to the public for the commercial provision of direct transport of real-time speech via the public switched network or networks such that any user can use equipment connected to a network termination point at a fixed location to communicate with another user of equipment connected to another termination point.
Virtual private network (VPN)	These are used by a company or private group to make inter-site connections either for telephone speech or data as if there were dedicated leased lines between these sites. The equipment used is located within the public telecommunications operator's premises and forms an integral part of the public network but is software-partitioned to allow for a genuinely private network
Wholesale Line Rental (WLR)	Wholesale line rental, or WLR, is when the incumbent offers at a wholesale level, narrowband access lines and associated features at the local switch in order to allow rival operators to offer retail customers a complete fixed narrowband access services with one single bill.
Wi-Fi	Wi-Fi (short for "wireless fidelity") is a term for certain types of wireless local area network (WLAN) that use specifications in the 802.11 family of standards. The term Wi-Fi was created by an organization called the Wi-Fi Alliance, which oversees tests that certify product interoperability. Wi-Fi access points provide Internet connection and virtual private network (VPN) access from a given location e.g. public places, such as airports, hotels, and coffee shops. Access is facilitated via the user's own portable computer.
WiMAX	WiMAX (Worldwide Interoperability for Microwave Access) is a wireless technology based on IEEE 802.16 standards for broadband wireless access (BWA) networks
White Label Access (WLA)	White Label Access-Voice Access (WLA-(Voice)) is a switchless voice service which allows an operator to purchase end-to-end call services without the need to have its own interconnection infrastructure.

Appendix A: Purchasing Power Parities (August 2014)

Purchasing power parities (PPPs) are the rates of currency conversion that eliminate the differences in price levels between countries. Comparative price levels are defined as the ratios of PPPs to exchange rates. They provide measures of the differences in price levels between countries. The PPPs are given in national currency units per US dollar.

In their simplest form, PPPs are simply price relatives which show the ratio of the prices in national currencies of the same good or service in different countries.

For example, if the price of a cauliflower in the United Kingdom is 2.00 pounds and in Ireland it is 1.50 euro, then the PPP for cauliflower between the United Kingdom and Ireland is 2.00 pounds to 1.50 euro or 1.33 pounds to the euro. This means that for every euro spent on cauliflower in Ireland, 1.33 pounds would have to be spent in the United Kingdom to obtain the same quantity and quality – or, in other words, the same volume – of cauliflower. One of the best known examples of this principle is the comparison of relative prices of a McDonald's Big Mac between countries as presented in *The Economist*.

The Central Statistics Office has also provided a user-guide to PPPs on its website.[12]

Fixed voice and fixed broadband baskets were updated in 2010 while mobile voice and mobile broadband baskets were updated in 2012.

12 http://www.cso.ie/en/media/csoie/surveysandmethodologies/surveys/prices/documents/pdf/ppp.pdf

Exchange rates used:		Aug-14
Related to:	US$	US$ PPP
Australia	0.9309	0.6420
Austria	1.3392	1.1254
Belgium	1.3392	1.1349
Canada	0.9171	0.7707
Chile	0.001747	0.0024
Czech Rep.	0.04856	0.0674
Denmark	0.1796	0.1182
Estonia	1.3392	1.5755
Finland	1.3392	0.9994
France	1.3392	1.1349
Germany	1.3392	1.2065
Greece	1.3392	1.3665
Hungary	0.004289	0.0069
Iceland	0.008704	0.0067
Ireland	1.3392	1.0545
Israel	0.2919	0.2393
Italy	1.3392	1.1957
Japan	0.009726	0.0088
Korea	0.0009747	0.0011
Luxembourg	1.3392	0.9994
Mexico	0.07585	0.1039
Netherlands	1.3392	1.1254
New Zealand	0.8494	0.6292
Norway	0.1595	0.0991
Poland	0.3216	0.5187
Portugal	1.3392	1.4557
Slovak Rep.	1.3392	1.7392
Slovenia	1.3392	1.4716
Spain	1.3392	1.2877
Sweden	0.1452	0.1100
Switzerland	1.1005	0.6474
Turkey	0.4681	0.7092
UK	1.6897	1.2898
USA	1	1

Appendix B: OECD Basket Methodologies

Fixed voice and fixed broadband baskets

The OECD has developed a set of methodologies for comparing retail prices of telecommunication services for the purpose of assessing the price levels experienced by consumers and businesses in the member countries.

The methodologies are based on a "basket" approach where a consumption pattern is described for different types of users, and the prices of corresponding services from each provider covered are used to calculate the resulting cost for each type of user. These baskets are referred to as the "OECD Baskets".

The baskets are reviewed and revised periodically as consumption patterns change. Previous revisions of the baskets took place in 2000, 2002 (mobile only), 2005 and now in 2009 with an OECD / Teligen workshop in Barcelona.

The baskets are based on actual traffic data and consumption data, collected from operators and regulators in the OECD member countries. The OECD, together with Teligen, has developed an approach to the collection of data and the development of basket methodologies that is based on the following elements:

- Input from the OECD / Teligen basket workshop in Barcelona June 2009.
- Traffic data and views submitted by operators and regulators in the OECD member countries up until the end of October 2009 and comments on the proposal presented in December 2009.

1.1 Fixed voice basket definitions

1.1.1 Voice call calculations

The 2009 basket revision includes a new method of accounting for different billing durations (e.g. per second, per minute). This issue concerns both the PSTN and the mobile baskets.

The former calculation of individual call costs was based on the standard (average) call duration specified in the basket for each type of call (destination and time). The call cost was calculated using the actual billing period, i.e. using the full number of billing units covering the call duration. Essentially, calls of various durations were rounded up to the next billing increment.

Table 1. Former method for calculating call durations by rounding to the nearest billable unit

60 second billing:	(75/60) = 2 units = 120 seconds
20 second billing:	(75/20) = 4 units = 80 seconds
Per second billing:	(75/75) = 75 units = 75 seconds

This meant that a 75 second call was billed as 75 seconds with per-second billing, and as 120 seconds with per minute billing. This approach took into account the billing system effect on the cost, but not the distribution of call durations. The selection of call duration in the basket would have a large influence on the level of overbilling of actual call time. For example, a call just over the billing increment would require a larger rounding up to reach the next increment while a call approaching the actual billing increment would have very little overbilling.

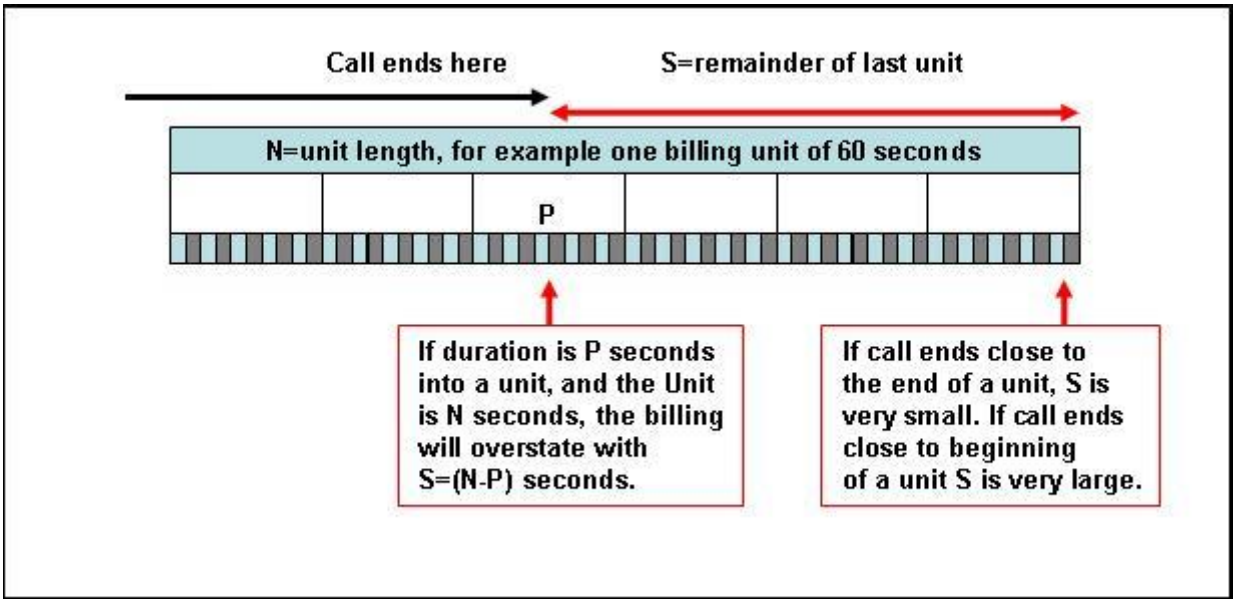
If the average duration used in the basket was just below a multiple of billing units there was a small additional time added as an effect of the billing. If, by contrast, the duration selected for the basket happened to be just above a multiple of billing units the additional time (and cost) added could be significant. The effect was somewhat arbitrary.

This 2009 revision changes the calculation to use the average duration defined by the basket, and then add an element related to the billing method and distribution. The rationale behind this can be explained as follows:

The new system for capturing differences in billing systems essentially calculates the price of a call based on the actual number of seconds stipulated by the basket and then

adds an additional adjustment reflecting the average "overbilling" of calls corresponding to the billing system. Figure 2 below shows how the amount of overbilling varies for each call.

Figure 1. Implications of the new methodology on different time-based billing systems



A call can have any duration, defined as A (seconds), and it ends P seconds into the last unit. When the billing unit duration is N (seconds) the actual billing will overstate the average duration with

S=0, 1, 2, 3, ……, N-1 seconds,

depending on the value of A. If we assume that there is an even likelihood of any of these durations (which is a simplification), the average overstated duration will be S=(N-1)/2. By adding this to the average duration before calculating the cost of the call, the effect of both the billing unit and the call distribution will be taken into account. The call calculation will then always be calculated as if the billing is based on average per minute charge, calculated to the fractions of a second before an adjustment for the billing systems is made.

Per minute billing	=	29.5 second adjustment
Per 20 second billing	=	9.5 second adjustment
Per second billing	=	0 second adjustment

Given an example with a 75 second call, the "adjusted" call duration will be calculated as follows under different billing systems:

Table 2. Revised method for calculating call durations based on the average overbilling for each method

60 second billing:	75 + (60-1)/2 = 75 + 29.5 = 104.5 seconds
20 second billing:	75 + (20-1)/2 = 75 + 9.5 = 84.5 seconds
Per second billing:	75 + (1-1)/2 = 75 + 0 = 75 seconds

With this "adjusted" call duration the cost per call is calculated on the basis of the charge per second in all cases.

If the "adjusted" call duration is shorter than the billing unit, the full price of one billing unit will be considered as the cost of the call. Any call set up charge will be added to the cost per call.

1.1.2 Selective discounts

Selective discount plans allow users to typically specify 1, 2, 3 or up to 10 or more numbers (depending on the plan) to which calls and/or messages will be free or discounted. The basket definitions generically refer to these plans as "selective discounts" although they are also known under brand names like "Friends and Family", "Bestmates", "Preferred numbers", "Calling circle" etc.

It is also worth noting that there will normally be an overall traffic increase with the introduction of selected discounts. Most of this increase will go to the nominated numbers, and will only have a limited effect on the end user cost as such calls are free or heavily discounted. In the basket calculations this increase is not considered.

The handling of the selective discount is based on the following elements and assumptions:

The total number of minutes for all calls in the basket is V

The discount applies to N nominated numbers

The discount D (%) applies to each of these calls

(D=100% is a free call)

The proportion of minutes A (%) receiving the discount is calculated based on the formula below, using V and N as input data. The proportion A is adjusted according to the discount D

(A2 = A x D)

Mapping information will indicate which call types are affected by the discount.

The remaining proportion A2 is used to calculate the number of minutes to be deducted from the basket minutes according to the call type mapping.

Cost of remaining minutes is calculated as usual.

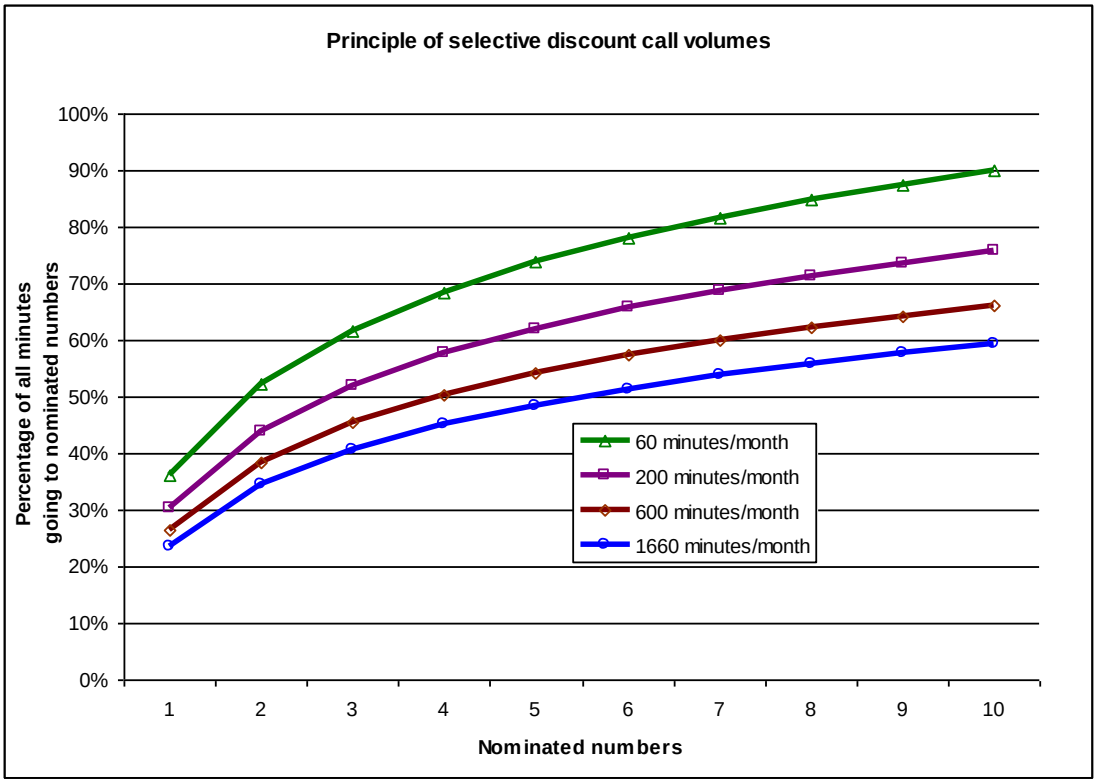
Where discounted SMS is offered as part of the discount they will be deducted using the same value A from the formula below, and the relevant discount applicable to the SMS.

The critical element is the calculation of A. This proportion is based on N (number of nominated numbers) and V (total minutes in basket), and an empirically developed function can be used to calculate the proportions as shown on the graph below. The function is:

$$A_{(\%)} = \text{Log}(10 \times N^{1.5}) / \text{Log}(10 \times V)$$

This function provides a proportion that resembles the amount of calls going to nominated numbers in the data received from operators in this basket review.

Figure 2. Selective call discount volumes



The selective discount will be taken before any minute, message and value allowances included in the package. The amount of minutes that will be deducted because of the selective discount is calculated as:

$$V_{(2)} = V_{(1)} \times (\text{Log}(10 \times N^{1.5}) / \text{Log}(10 \times V)) \times D$$

where $V_{(1)}$ is the total number of minutes defined by the basket, and $V_{(2)}$ is the number of minutes going to the nominated numbers

$V_{(2)}$ is then distributed to the specific call types according to the selective discount mapping. Each call type will have between zero and $V_{(2)}$ minutes to be deducted. The remaining minutes for each call type is used for the following distribution of allowances and calculation of call costs.

1.1.3 Local calling areas for the PSTN baskets

Previous versions of the baskets provided 14 discrete distances for national fixed line calls. This enabled both a distance distribution and a method for incorporating the size of local calling areas. The baskets now use only local and national areas to describe the national destinations for fixed line calls, due to considerable simplifications in the pricing of such calls in recent years.

In order to allow for differences in the size of local calling areas the following adjustment of the local and national call proportions will be used, based on the closest size of local calling area:

Table 3. Local and national call proportions

Average local call radius	Local adjustment	National adjustment
10 km	-8.9%	+8.9%
15 km	-4.2%	+4.2%
20 km	-1.4%	+1.4%
25 km	0.0%	0.0%
30 km	3.2%	-3.2%
50 km	6.4%	-6.4%
100 km	9.6%	-9.6%

In addition, the percentages above must be adjusted with the proportion of fixed line calls in each basket, as given in Table 4 below.

Table 4. Basket adjustment

	Basket adjustment
20 calls basket	81%
60 calls basket	75%
140 calls basket	73%
420 calls basket	90%
100 calls business basket	67%
260 calls business basket	66%

An example: The 60 calls basket will have the following adjustment factors:

Table 5. Example – 60 call basket

Average Local call area radius	Local adjustment	National adjustment
10 km	-6.7%	6.7%
15 km	-3.2%	3.2%
20 km	-1.1%	1.1%
25 km	0.0%	0.0%
30 km	2.4%	-2.4%
50 km	4.8%	-4.8%
100 km	7.2%	-7.2%

If the operator, for example, uses an average local calling radius of 15 km, the fixed-to-fixed local proportion will be 60% - 3.2% = 56.8%, and the fixed-to-fixed national portion will be 15% + 3.2% = 18.2%.

1.2 General fixed voice basket rules

For each operator a relevant number of packages shall be included. Combinations of packages are allowed. Discounts shall be incorporated in the calculations of prices for each basket. Only tariffs presented clearly as current tariffs on the operator web pages will be considered.

Selective discounts are calculated with the algorithm described above.

There are 4 residential and 2 business baskets:

Table 6. Residential and business PSTN baskets

Type of basket	Basket
Residential	20 calls basket
Residential	60 calls basket
Residential	140 calls basket
Residential	420 calls basket
Business	100 calls business basket, single user
Business	260 calls business basket, single user

Nonrecurring charges are covered using the charge for a new installation of a service.

Nonrecurring charges are distributed over 5 years, except where the installation is a tradable asset (Japan) where the charge is distributed over 20 years.

Call costs are calculated using the duration of $D + (Unit_{(seconds)}-1)/2$, based on basket call duration D converted to seconds and average per second charges. Unit is the billing unit in seconds.

National call charges to fixed networks are based on a local / national split. While this is adequate for most prices, some operators may split their prices into local / regional / national. In such cases only the prices for local and national areas will be considered.

The proportion of calls to the local calling area will be adjusted for local calling area radius as described above in Table 3.

When call charges to mobile networks differ by network, the weighted average charge for calls to all national mobile networks shall be used, based on available subscriber numbers.

International calls to other OECD countries are included, with call charges weighted according to actual traffic volumes. This means that those destinations with the most traffic will carry the most weight. Traffic volume weights can be provided by national regulators. Until such weights are provided the existing weights are used.

For international calls the highest charge is used for peak time, and the lowest is used for off-peak time.

Allowances are deducted in the following order: Selective discounts, minute allowance, value allowance. Specific volume discounts will be deducted from the total cost at the end.

Results are presented in EUR / PPP per month, including VAT for both business and residential baskets. For international comparisons nominal exchange rates can be used.

1.3 Fixed voice basket parameters

Table 7. Overall basket volumes and destination distribution (Fixed)

		Call distribution			
Calls per month	**Total calls**	**Fixed to fixed Local**	**Fixed to fixed National**	**Fixed to mobile**	**International**
20 calls basket	20	61%	20%	17%	2%
60 calls basket	60	60%	15%	21%	4%
140 calls basket	140	58%	15%	23%	4%
420 calls basket	420	73%	17%	8%	2%
100 calls business basket	100	48%	19%	30%	3%
260 calls business basket	260	43%	23%	25%	9%

Table 8. Time of day distribution: Fixed to fixed

	Fixed to Fixed		
	Day	**Evening**	**Weekend**
20 calls basket	53%	25%	22%
60 calls basket	60%	22%	18%
140 calls basket	52%	26%	22%
420 calls basket	52%	26%	22%
100 calls business basket	69%	17%	14%
260 calls business basket	75%	15%	10%

Table 9. Time of day distribution: Fixed to mobile

	Fixed to Mobile		
	Day	**Evening**	**Weekend**
20 calls basket	45%	28%	27%
60 calls basket	57%	22%	21%
140 calls basket	46%	27%	27%
420 calls basket	46%	27%	27%
100 calls business basket	69%	18%	13%
260 calls business basket	77%	14%	9%

Table 10. Time of day distribution: International (fixed)

	International	
	Peak	**Off peak**
20 calls basket	45%	55%
60 calls basket	44%	56%
140 calls basket	47%	53%
420 calls basket	47%	53%
100 calls business basket	75%	25%
260 calls business basket	87%	13%

1.3.1 PSTN call durations

Table 11. PSTN call durations: Fixed to fixed local, minutes per call

	Fixed to fixed local		
	Day	**Evening**	**Weekend**
20 calls basket	2.6	4.0	2.6
60 calls basket	2.6	3.8	2.9
140 calls basket	3.1	4.8	3.7
420 calls basket	3.6	5.4	5.4
100 calls business basket	1.9	2.3	2.1
260 calls business basket	2.0	2.8	3.1

Table 12. PSTN call durations: Fixed to fixed national, minutes per call

	Fixed to fixed national		
	Day	Evening	Weekend
20 calls basket	4.0	6.3	5.4
60 calls basket	4.1	6.4	6.4
140 calls basket	4.7	7.6	7.1
420 calls basket	5.3	8.1	8.1
100 calls business basket	2.3	3.3	3.3
260 calls business basket	2.4	2.7	3.4

Table 13. PSTN call durations: Fixed to mobile, minutes per call

	Fixed to mobile		
	Day	Evening	Weekend
20 calls basket	1.5	2.1	1.3
60 calls basket	1.9	2.4	1.9
140 calls basket	1.7	2.3	2.1
420 calls basket	1.8	2.3	2.3
100 calls business basket	1.6	1.9	1.5
260 calls business basket	1.7	2.2	1.9

Table 14. PSTN call durations: International

	International	
	Peak	**Off peak**
20 calls basket	4.6	6.2
60 calls basket	4.7	6.8
140 calls basket	4.7	6.8
420 calls basket	5.0	8.1
100 calls business basket	3.2	5.4
260 calls business basket	3.7	4.1

Table 15. International calls destinations

Destination	Weight	Destination	Weight
Australia	**1.38%**	Japan	**-**
Austria	**0.37%**	Korea	**-**
Belgium	**0.90%**	Luxembourg	**-**
Canada	**1.34%**	Mexico	**-**
Chile	**-**	Netherlands	**2.46%**
Czech Rep.	**-**	New Zealand	**-**
Denmark	**0.55%**	Norway	**0.28%**
Estonia	**-**	Poland	**0.43%**
Finland	**0.52%**	Portugal	**0.32%**
France	**3.39%**	Slovak Rep.	**-**
Germany	**3.50%**	Slovenia	**-**
Greece	**-**	Spain	**2.22%**
Hungary	**-**	Sweden	**0.89%**
Iceland	**-**	Switzerland	**0.64%**
Ireland	**-**	Turkey	**-**
Israel	**-**	UK	**67.24%**
Italy	**1.47%**	USA	**11.56%**

1.4 General Fixed Broadband Basket rules

The baskets shall include fixed broadband services provided over ADSL, cable and fibre networks[13].

The basket shall include the following charge elements: Connection (one off) charge, Monthly rental charge, Usage allowance (time or volume), Overage charges.

Each basket will describe the minimum bitrates covered within the basket and the level of usage.

Basket results will contain fixed and usage costs for each package. Where an allowance is exceeded and the service is stopped or speed reduced until the end of the billing period, the package will not be included in the basket results. Non-recurring price elements are depreciated over three years.

Given the range of data allowances across OECD countries, the broadband basket will include two profiles – one for lower and another for higher use (see Table 20).

Table 20. Fixed broadband basket profile, by advertised download capacity

	Usage per month			
	Lower use		Higher use	
Speed range	GB	Hours	GB	Hours
>0.25 Mbit/s	2	10	6	30
>2.5 Mbit/s	6	15	18	45
>15 Mbit/s	11	20	33	60
>30 Mbit/s	14	25	42	75
>45 Mbit/s	18	30	54	90

[13] ComReg also analyses tariffs provided over Fixed Wireless Access (FWA) Networks

1.5 General basket rules

A range of relevant price packages is be covered, allowing the lowest cost package to be selected for each operator. Only prices clearly presented as current on the operator web pages will be considered.

Some of the proposed baskets (handset-based baskets) contain voice and SMS components, which are determined by the existing mobile voice baskets. Therefore, voice and SMS volumes of the handset-based baskets should be understood in the sense of the OECD mobile basket methodology, whose parameters are reproduced below for clarification purposes. Handset-based baskets will also include business offers, as established by that methodology.

The baskets shall include mobile wireless broadband services. Services considered are based on UMTS, HSPA/HSPA+, CDMA2000, IEEE 802.16e and LTE technology.

WiFi or hotspot usage is not included, even though some offerings may include this capability. The subscription must allow for access to the greater Internet via HTTP. Subscriptions that only offer "walled garden" or email-only services will not be considered. A subscription is not included if a terrestrial mobile operator only provides access to a limited number of websites, content, and/or applications such as games, ring tones, music, and pictures that are offered directly by the mobile operator and customised for that operator's network and devices.

The baskets shall include the following charge elements: connection (one-off) charge, monthly rental charge, usage allowance (time or volume) and overage charges (i.e. charges above the subscriber's monthly limit).

At least the two largest network operators are covered for each country, based on subscriber numbers.

Basket results will contain fixed and usage cost for each package. Where an allowance is exceeded and the service is stopped or speed reduced until the end of the billing period, the package will not be considered in the basket results for those baskets exceeding the data allowance of that package. If there is an option of purchasing additional data allowances once the limit has been reached, both the new price and the new allowance can be considered.

Different patterns have been reported for handset-, tablet- and laptop-based usage. Laptop-based (or tablet-based) service provides connectivity using a laptop (or tablet) and a USB modem, dongle, etc (without explicit voice capability). Handset-based service is provided through a smartphone or other type of mobile handset (with voice capability). These three types of devices have different usage patterns.

Accordingly, there will be three different sets of mobile wireless baskets: handset-based, tablet-based and laptop-based. Future evolution of terminal equipment and associated plans will be monitored in the context of the baskets review.

Pre- and post-paid tariffs are included. Only residential, single user tariffs are included (except for the handset baskets, which include business offers as well, as defined by the OECD mobile basket methodology). Offers should be advertised on the operator's website.

Non-recurring price elements are depreciated over three years.

Advertised Speeds

Common peak theoretical speeds, in current networks, are 7.2 Mbps and 14 Mbps. Recent developments are pushing these peak theoretical speeds up to 21 Mbps and higher. LTE peak theoretical speeds in the 50-100 Mbps range are being offered in some markets. Currently, some markets have the majority of customers on networks with 7.2 mbps, while other markets have already upgraded over half of their customers to the 14/21 Mbps networks.

It is crucial to highlight that the actual speed experienced by the customer may be much lower than the theoretical network speed. For this reason, many operators refrain from mentioning speed when advertising the service. This poses considerable challenges to using speed as a parameter and, therefore, suggests that advertised speeds should not be used in the baskets. LTE offers will be flagged, as well as those corresponding to peak theoretical speeds of at least 20 Mbps. For the future, a number of online and transparent tools may emerge to monitor the average actual speeds experienced by users. If this occurs the baskets could be reassessed accordingly.

Usage Patterns

The methodology will exclude those offers with time-based limitations, for example by the number of monthly hours of use, or daily or weekly offers. Only those offers where the allowance can be freely used over a whole month will be considered. Therefore, the number of hours or days of use per month are not parameters in the methodology.

Data volumes include both upload and download data volumes.

Excess usage, i.e. beyond data or time allowance, is considered in one of two ways:

- If throttling is used the tariff is excluded from the results if the basket volume exceeds the allowance. This will also apply if both throttling and overage charges are applied to a given offer. In this regard, throttling practices specified by acceptable use policies (AUPs) will also be considered.
- If excess usage results in overage charges the additional cost is added to the total as a usage element to pick the level of usage specified in a basket.

Operators have mainly reported data based on laptop use. The available evidence suggests that usage volumes are significantly lower when browsing the Internet from a mobile handset/smartphone. It has been also suggested that tablet use is around a half of laptop use. For example, while laptop-based tariffs have allowances in the 500 MB to 10 GB range, handset-based tariffs (e.g. smartphones) will have allowances in the 100 MB to 2 GB range. The range offered may of course vary from market to market.

Given these very distinct usage patterns and tariff packages and the emergence of tablet-specific plans, it is proposed to develop three different sets of mobile broadband baskets: one laptop-based (using

USB keys, dongles, etc.), one tablet-based and one handset-based (including smartphones), where the latter will approximately have an allowance of one fifth (1/5) of the corresponding laptop-based basket. Some operators offer flexible plans that will automatically escalate customers to higher allowance plans as usage increases.

Basket Proposals

The following typical data allowances are based on the distribution of customers on allowances, taking into account usage forecasts provided by operators. Voice and SMS volumes of the handset-based baskets should be understood in the sense of the OECD mobile baskets.

Table 1: Mobile broadband basket proposal – tablet, laptop and handset use

Laptop use (data volumes)	Tablet use (data volumes)	Handset use (data volumes + voice/SMS basket)
500 MB	250 MB	100 MB + 30 calls basket
1 GB	500 MB	500 MB + 100 calls basket
2 GB	1 GB	1 GB + 300 calls basket
5 GB	2 GB	2 GB + 900 calls basket
10 GB	5 GB	2 GB + 100 calls basket

Laptop- and tablet-based mobile broadband baskets

Options including the provision of a laptop, netbook, notebook or tablet are not considered. Any additional price for a modem (*e.g.* USB key, dongle, etc.) shall be included, unless it is not available.

Handset-based mobile broadband baskets

The handset-based basket group will be based on bundles of voice, SMS and data (each one of them including a certain amount of voice, SMS and data). For this purpose, a data allowance will be associated to one existing mobile basket (*e.g*. 100 MB + 30 calls basket).
Handset-based baskets will also include business offers, as they are conceived as an add-on to the mobile voice baskets, which include business offers.

1.6 Mobile basket parameters

Table 2. Mobile: Overall basket volumes and destination distribution

Volume per month	Total calls per month	Call distribution				
		Mobile to fixed	On-net	Off-net	Voicemail	SMS
30 calls basket	30	16%	55%	25%	4%	100
100 calls basket	100	17%	52%	28%	3%	140
300 calls basket	300	14%	46%	37%	3%	225
900 calls basket	900	14%	55%	28%	3%	350
40 calls prepaid basket	40	14%	64%	18%	4%	60
400 messages basket	8	8%	55%	25%	12%	400

Table 3. Mobile time of day distribution

	Voice call distribution			Message distribution			
	Day	Evening	Weekend	Peak	Off-peak	On-net	Off-net
30 calls basket	46%	29%	25%	66%	34%	53%	47%
100 calls basket	51%	26%	23%	66%	34%	51%	49%
300 calls basket	49%	32%	19%	66%	34%	50%	50%
900 calls basket	49%	32%	19%	66%	34%	50%	50%
40 calls prepaid basket	46%	29%	25%	66%	34%	53%	47%
400 messages basket	46%	29%	25%	66%	34%	50%	50%

Table 4. Mobile voice call durations

	Call duration (minutes / call)			
	Mobile to fixed	On-net	Off-net	Voicemail
30 calls basket	2.0	1.6	1.7	0.9
100 calls basket	2.1	1.9	1.8	1.0
300 calls basket	2.0	2.0	1.8	1.0
900 calls basket	1.9	2.1	1.9	1.1
40 calls prepaid basket	1.9	1.9	2.0	0.9
400 messages basket	1.6	2.2	1.6	1.1