



Commission for  
**Communications Regulation**

## Irish Communications Market

### Quarterly Key Data

#### Explanatory Memorandum

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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 22<sup>nd</sup> 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 very 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 on 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.

## Primary Data

Section	Indicator	Definition
1.1.1	<b>Total Number of Authorisations</b>	Total number of cumulative authorisations issued since July 25 <sup>th</sup> 2003 by ComReg to fixed, mobile and broadcasting operators.
1.2.1	<b>Fixed, mobile and broadcasting as a % of total revenues</b>	The share of total revenue generated by the provision of retail and wholesale fixed and mobile voice and data services as well as retail cable and MMDS broadcasting services
1.3.1	<b>Share of Total voice call volumes</b>	Overall total volumes or minutes of 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.
2.1.1	<b>Total revenue per service</b>	Total revenue generated by the direct <sup>1</sup> and indirect <sup>2</sup> provision of retail and wholesale fixed voice and data services. Includes interconnection, retail narrowband services (such as PSTN voice services and dial-up Internet services), leased line & managed services (including revenues from Partial Private Circuits) and other ancillary services including broadband, web-hosting, co-location services, directory publication & other services.
2.1.2	<b>Market share of fixed line revenues</b>	The proportions of overall fixed line revenues (retail and wholesale) received by alternative operators and eircom. Includes shares of interconnection, retail narrowband, Leased line and managed services (including revenues from Partial Private Circuits), and other ancillary services including broadband, web-hosting, co-location services, directory publication and other services.

<sup>1</sup> Provided to customer over their supplier's own network infrastructure

<sup>2</sup> Provided to customer by means of their supplier's wholesale access to another operator's network infrastructure

Section	Indicator	Definition
2.2.1	<b>Fixed access paths</b>	<p>Total number of direct<sup>3</sup> and indirect<sup>4</sup> fixed 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. There is a one-to-one relationship between PSTN lines and access paths, i.e. one PSTN access path is equal to one line.</p> <p>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.</p>
2.2.2	<b>Indirect access lines</b>	<p>Total number of indirect<sup>5</sup> fixed telephone lines provided to customers by means of carrier pre-select only or wholesale line rental.</p> <p>Carrier pre-select allows the user to receive all or a portion of calls from one provider and line rental from another provider (usually eircom).</p> <p>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 one single supplier. Note: this indicator counts the lines using either carrier pre-select or wholesale line rental.</p>
2.3.1	<b>Fixed voice call volumes</b>	<p>Total number of retail minutes or traffic generated by means of fixed voice calls both direct<sup>6</sup> and indirect<sup>7</sup></p> <p>Call volumes are broken down into domestic (including calls to Northern Ireland), international outgoing calls, calls to mobile and other (this category includes calls made from payphones).</p>
2.5.1	<b>Number of Subscribers: Narrowband and Broadband</b>	<p>Breakdown of internet subscribers over copper lines, including dial-up narrowband subscribers (PSTN and ISDN), flat-rate narrowband and DSL technologies, as a percentage of total internet subscribers.</p> <p>Narrowband Dial-up is defined here as a metered service (typically over a dedicated 1891 or 1892 number) where the customer pays a variable charge per month based on their specific usage of the internet. This includes subscribers who have a subscription with an ISP and those customers who do not have a subscription to an ISP.</p> <p>Narrowband Flat-rate Internet subscription is a service (typically provided over an 1893 number) where the customer pays a flat monthly fee for a defined number of hours of dial-up Internet access.</p> <p>Narrowband data includes both business and residential customers.</p> <p>Broadband subscribers are Digital Subscriber Line (DSL) subscribers, i.e. those using their 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</p>

<sup>3</sup> See note 1 above

<sup>4</sup> See note 2 above

<sup>5</sup> ibid.

<sup>6</sup> Provided to customer over their supplier's own network infrastructure

<sup>7</sup> Provided to customer by means of their supplier's wholesale access to another operator's network infrastructure

Section	Indicator	Definition
		internet. However some providers also offer time-based broadband services, i.e. the user pays for a limited amount of hours of broadband access per month.  Broadband data includes both business and residential customers.
2.6.1	<b>Provision of DSL access</b>	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. <sup>8</sup> DSL (Digital Subscriber Line) is a technology for bringing high-bandwidth or broadband information to homes and small businesses over ordinary copper telephone lines.
2.7.1	<b>Broadband subscribers and growth rates by platform</b>	This table includes the most recent subscriber numbers (both residential and business subscribers) across DSL, cable, satellite, fibre and fixed wireless platforms. The growth rates are for quarterly and year-on-year growth in subscriber numbers across each broadband access platform and for total broadband subscriber growth.
2.7.2	<b>Broadband subscribers by platform</b>	Total number of broadband subscribers (both residential and business customers) by means of DSL, cable modem, fibre, satellite and/or fixed wireless access. Cable modems allow internet broadband access by means of cable TV. Fixed wireless access allows internet broadband access by means of wireless devices or systems in fixed locations such as homes and offices.
2.7.3	<b>Market share of total broadband market</b>	This chart shows eircom's, OAOs' retail DSL market shares and alternative broadband platforms' share as a percentage of the total broadband market.
3.1.1	<b>Irish mobile penetration rate</b>	Total number of mobile phone subscribers (GSM or 2G and 3G, both contract and prepaid) in Ireland as measured by the total number of active SIM cards divided by the total population and multiplied by 100. A Prepaid subscriber is a customer who subscribes to a prepaid tariff plans and has made an outgoing call within the previous 3 months. A contract customer refers to a customer with a current contract subscription.
3.1.3	<b>Number of subscribers (pre-paid/post paid)</b>	Percentages of total number of mobile phone subscribers (GSM or 2G and 3G) broken down by pre-paid and post-paid (i.e. contract) packages.
3.1.4	<b>Number of subscribers (pre-paid/post paid) by operator</b>	Percentages of total number of mobile phone subscribers (GSM or 2G and 3G) to each of the mobile networks, broken down by pre-paid and post-paid (contract) packages
3.2.1	<b>Market share – number of subscribers</b>	Each mobile operator's share of the total number of mobile subscribers (GSM or 2G and 3G), expressed as a percentage.
3.2.2	<b>Market share – revenue</b>	Each mobile operator's share of total mobile retail revenues (GSM or 2G and 3G), expressed as a percentage.
3.3.1	<b>Mobile Numbers Ported</b>	Total number of mobile numbers which have been retained by customers when they switched from one mobile operator to another. This represents a

<sup>8</sup> 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, and 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

Section	Indicator	Definition
3.4.1	<b>SMS, MMS and Call minutes</b>	cumulative total since MNP was introduced in July 2003. Total volumes of mobile voice (calls) and data messages (both SMS and MMS) <sup>9</sup> made over mobile networks.
4.1.1	<b>Take-up of broadcasting services</b>	Percentages of TV households in Ireland broken down by the platforms used to deliver TV services – satellite, digital cable, analogue (or basic) cable and free-to-view.
4.1.2	<b>Pay TV market (analogue and digital)</b>	Percentages of total pay TV households broken down by analogue pay TV (such as basic cable) and digital pay TV platforms such as digital cable and satellite.
4.1.4	<b>Digital TV Penetration (Cable and Satellite Breakdown)</b>	% breakdown of digital TV subscribers between those using digital cable and satellite services.

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<sup>9</sup> SMS – Short Messaging Service; MMS = Multimedia Messaging Service

## Secondary data

### Pricing data

Sections 1.4, 2.4, 2.8 and 3.6 contain comparative pricing data and are supplied by Teligen in its T-Basket product.

The pricing data is valid as May 2006 for all baskets.

An OECD-approved methodology was adopted by Teligen to compare fixed (PSTN) and mobile tariffs. This format follows a basic three-step process consisting of: (i) the construction of one or more baskets of telephone services; (ii) the pricing of those baskets; and (iii) the conversion of the individual currencies to standard units (e.g. US dollar with Purchasing Power Parities (PPPs)). Section 6 of this document provides more detail on the base rates used to calculate PPPs in the Teligen tariff baskets.

Both the PSTN and mobile baskets were updated following a public workshop in Rome in July 2005.

Changes made as a result of this workshop are in addition to any tariff changes, and will have much more of an effect on results compared to the last update.

Because substantial changes were rolled out in the February and May 2006 updates, no comparisons have been made with previous quarters in the overview section (1.4) as tariff baskets prior to 2006 are not comparable with 2006 baskets

Each chart for May 2006 displays a number in brackets against each country which is the respective position in the February baskets. Comparative pricing charts in this section will be published in this section in Q3 2006

Only incumbent operators are covered in the fixed baskets while the two largest operators are covered in the mobile baskets.

The mobile baskets are for 2G or GSM services only.

For the fixed international baskets, the weighting between the peak and off-peak charges has been changed, as well as the call duration for each of these call types.

The major difference in structure with the revised methodology is that the PSTN basket includes multiple price plans for each country / operator and the calculation extracts the cheapest tariff for each chosen basket. With this in mind, the cheapest tariff for international calls for Ireland is not the same tariff that would have been used in the November 2005 basket. A cheaper option is now included in the comparison, which will account for the improvement in position. Similar changes have been made for other countries.

For the mobile low, medium and high user profiles, The 'Fixed' component of price refers to the standard charges imposed by operators, regardless of the amount of calls made (i.e. connection and rental). T-basket calculation of this figure is made up of: Installation Charge/5 + Rental charge for 1 year. The 'Voice' component of price refers to the charges imposed by operators, arising from the number of voice calls made by the user, while "Message" refers to the charges imposed by operators, arising from the number of SMS and MMS messages sent by the user. Many mobile operators bundle a set amount of texts or voice minutes with the subscription fee and the user then pays for any excess voice calls or text messages consumed over and above the bundled amount.

The DSL baskets were commissioned separately by ComReg from Teligen.

Teligen uses two methodologies for DSL pricing developed to highlight variations in price levels across Europe using different assumptions. The ADSL offerings from the incumbent operator or associated ISP in each of the EU15 countries are used.

The tariffs used in the comparison relate to the installation and rental of the ADSL service only, not to the provision of the standard telephone line over which DSL is provided. Charges for modems or routers and ISP subscription charges are only included in the comparison in cases where they are bundled in with the complete service offering.

The two comparisons aim to benchmark a combination of the relevant costs based on the speed (bitrate) of the service. Teligen's research suggests that there is no single bitrate combination that is offered in all countries, and therefore creating an inter-country price comparison is quite difficult. In order to overcome this and produce a set of indicators representative of price levels, both of the following methodologies should be considered:



**Normalised prices to a common bitrate** – The calculated price for 1 Mbit/s bitrate is chosen as a measure. This price is produced by:

- Adding the upload and download bitrates to get a total bitrate (e.g. 64 kbit/s upload and 256 kbit/s download gives a total bitrate of 320 kbit/s);
- The monthly rental is divided by the calculated total bitrate and multiplied with 1024 to give the price per 1 Mbit/s;
- For the installation charges the highest charge per provider is used (if appropriate). This will in most cases, where appropriate, correspond with the lowest normalised monthly rental charge found, i.e. the offering identified by the normalisation process described above. The installation charge is depreciated over 5 years.

The implications of this normalisation are:

- As the monthly price per unit (i.e. per Mbit/s) will normally decrease with increasing bitrate, the offerings with higher total bitrates will be favoured. Providers offering only “low speeds” will fall behind in the comparison;
- The prices shown are not actual prices paid by the customer. Tracing the calculations back to the origin requires information about the actual bitrates involved;
- As prices for installation tend to be independent of the bitrate, a similar normalisation is not really relevant for these charges.
- The Irish broadband package benchmarked in this chart is eircom’s Home Professional DSL package.

**Actual prices for the cheapest offering** – As an alternative to the normalised method above, the actual prices for the cheapest offering from each provider can be compared.

- The price comparison comprises the monthly rental charge for the cheapest offering for each operator and the installation charge associated with this offering (depreciated over 5 years);
- Due to the differences in bitrates, however, it is important to also show what the customer actually receives for their money, i.e. the bandwidth of the service.
- The results of the cheapest monthly price comparison should therefore be shown together with the bitrates provided at those prices, so that the reader is able to assess the suitability of the service and the value for money.

This method of showing the prices means:

- Prices are not directly comparable. Ultimately it would be necessary to consider other elements of each service offering (i.e. inclusive data transfer limits, webspace/e-mail addresses etc.) to find out the actual value of any price/bitrate combination.
- The providers offering low bitrates will usually also have the lowest prices. This means that the low-bitrate services will be favoured using this method of presentation.
- The Irish broadband package benchmarked in this chart is eircom’s Broadband Time DSL package

**Results:**

Results are given in US\$/PPPs including VAT for residential baskets and excluding VAT for business baskets. The results of these 2 benchmarks should be considered together – the normalised method favours services with higher bitrates, whereas the minimum rental method favours lower bitrates. Considering both will give an enhanced picture of price variations.

It is important to remember that these comparisons do not consider some elements of ADSL services that may well have an impact on the way they are priced – these might include carrier specific “Quality of Service” features, such as guaranteed transmission bitrates, or limitations on the maximum volume of transmissions. It does, however, produce comparable price points for what are widely different offerings across the countries in the comparison. **It should be noted that cheaper or more expensive services may be offered in each country by other service providers.**

## Other data

### *Figure 2.7.4 Broadband Penetration Rate*

This chart from ECTA compares broadband penetration (i.e. DSL and alternative platforms such as cable modem) across the EU-25 member countries based on a per capita measurement, i.e. broadband subscribers per 100 population (total broadband subscribers/total population X 100/1)

### *Figure 3.1.2 European mobile penetration rates*

Total number of mobile phone subscribers (GSM and 3G) in the EU-15 as measured by the total number of active SIM cards divided by the total population and multiplied by 100. The definition of "active subscriber" differs from operator to operator. This chart is based on data supplied by Informa Telecoms & Media in their fortnightly *Mobile Communications* journal.

### *Figure 3.5.1 Data revenues as a % of total revenue*

This chart ranks a number of EU countries based on the percentage of total mobile retail revenues contributed by data services such as SMS and MMS. Data is supplied by the Yankee Group based on analysis of operator data in each country which is then averaged across all operators in each country.

### *Figure 3.5.2 European ARPU Compared*

This chart ranks a number of EU countries based on a blended monthly ARPU (Average Revenue per User) as calculated by the Yankee Group. The blended ARPU is calculated as an average of ARPU across all operators in a number of markets based on a number of variables including average churn rates, marketable mobile market, mobile penetration rates and population statistics.

## Glossary

<b>Access Line</b>	A circuit that connects a subscriber to a switching centre.
<b>ADSL</b>	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).
<b>Analogue</b>	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). Analog signals vary along two parameters, amplitude (strength) and frequency (tone). The unit of measurement is the Hertz, or cycle per second.
<b>ATM</b>	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.
<b>ARPU</b>	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.
<b>Bandwidth</b>	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).
<b>Bits per second</b>	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.
<b>Broadband</b>	A service or connection allowing a considerable amount of information to be conveyed, such as television pictures. Generally defined as a bandwidth > 2Mbit/s Broadband Integrated Services Digital Network (B-ISDN). The capability to integrate any type of communications signals (voice, data, image or multimedia) and carry them over a single broadband channel of 150-mbps and above, 4k (B-ISDN) regardless of their content.
<b>Cable Modem</b>	A cable modem is a device that enables a PC to be linked to a local cable TV line for internet/data services.
<b>Calling Line Identity (CLI)</b>	A facility that enables identification of the number from which a call is being made.
<b>Carrier Pre-selection (CPS)</b>	The facility offered to customers which allows them to opt for certain defined classes of call to be carried by an operator selected in advance (and having a contract with the customer), without having to dial a routing prefix or follow any other different procedure to invoke such routing.
<b>Co-location</b>	The provision of space for a customer's telecommunications equipment on the service provider's premises.
<b>Dial-up</b>	Connections made to a data network using the switched network to provide a voice band or data bearer.
<b>Digital</b>	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.
<b>Digital Subscriber Line (DSL)</b>	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.
<b>Direct Access</b>	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.
<b>Directory Enquiry Service (DQ)</b>	Directory information service which is operator assisted and involves the operator looking up entries on a database.
<b>Fibre Optic Cable</b>	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.
<b>Fixed telephone Services</b>	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.
<b>Flat Rate Internet Access (FRIACO)</b>	The provision of a Flat Rate Internet Access Call Origination via a wholesale un-metered Internet access product.
<b>Fixed Wireless Access (FWA)</b>	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.
<b>Global System for Mobile Communications (GSM)</b>	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.
<b>ICT</b>	Information & Communications Technologies
<b>Independent Service Provider (ISP)</b>	Entities which provide telecommunications services over fixed or mobile networks, or services with a telecommunication service component, to the public at large but do not own or operate telecommunications networks.
<b>Indirect Access</b>	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.
<b>Integrated Services Digital Network (ISDN)</b>	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.
<b>Interconnection services</b>	Services provided by one telecommunications organisation to another 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.
<b>Internet protocol (IP)</b>	Packet data protocol used for routing and carriage of messages across the internet.
<b>Internet telephony</b>	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).
<b>ISP</b>	Internet Service Provider
<b>Leased line</b>	Point to point symmetric capacity between network termination points, whether contended or uncontended, which does not include 'on demand switching' or routing functions controlled by the end user'.
<b>Local Loop</b>	The access network connection between a customer's premises and the local exchange. This usually takes the form of a pair of copper wires.
<b>Local Loop unbundling (LLU)</b>	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.
<b>Managed services</b>	Managed services include fully outsourced network management arrangements, including advanced features like IP telephony, messaging and call center, 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.
<b>Mobile Number Portability (MNP)</b>	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.
<b>Modem</b>	A device which converts digital signals from a data-transmitting terminal into modulated analogue signals which can be carried by a public telephone network.
<b>Multimedia messaging Service (MMS)</b>	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.
<b>Multipoint Microwave Distribution System (MMDS)</b>	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.
<b>Narrowband</b>	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.
<b>Originating network</b>	The network to which a caller who makes a call is directly connected.
<b>Other Authorised Operators (OAOs)</b>	Companies, other than eircom, which operate telecommunications systems.
<b>Partial private Circuit (PPC)</b>	A type of wholesale leased line that allows OAOs to efficiently combine their network infrastructure with capacity provided by the incumbent.
<b>Path</b>	A path is a route between any two points or nodes.
<b>Premium rate services (PRS)</b>	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.
<b>Private circuits</b>	Point-to-point circuits for customers exclusive use covering speech, data or image communications.
<b>Public switched telephone network (PSTN)</b>	A voice-oriented public telephone network. Also known as the Plain Old Telephone Service (POTS).
<b>Public telecommunications network</b>	A telecommunications network used, in whole or in part, for the provision of publicly available telecommunications services.
<b>Purchasing Power Parities (PPPs)</b>	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.
<b>Resellers</b>	Service Providers who do not have their own network.
<b>Roaming</b>	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.
<b>Short message service (SMS)</b>	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.
<b>Spectrum</b>	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.
<b>Subscriber Identity Module (SIM)</b>	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.
<b>Switch</b>	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.
<b>Telecommunications</b>	Conveyance of speech, music and other sounds, visual images or signals by electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical means.
<b>Third generation mobile systems (3G)</b>	A European 3G mobile communications system provides an enhanced range of multimedia services (e.g. high speed Internet access).
<b>Transit</b>	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.
<b>Trunk network</b>	That part of a telecommunications network which provides connections between.
<b>Voice over Internet protocol (VoIP)</b>	The generic name for the transport of voice traffic using Internet Protocol (IP) technology. The VoIP traffic can be carried on a private managed network or the public Internet (see Internet telephony) or a combination of both. Some organisations use the term 'IP telephony' interchangeably with 'VoIP'.
<b>Voice telephony service</b>	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.
<b>Virtual private network (VPN)</b>	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
<b>Wholesale Line Rental (WLR)</b>	A facility offered to customers of OAOs whereby they can opt to receive a single bill for their telephony rental, calls and other ancillary services.
<b>Wi-Fi</b>	Wi-Fi (short for "wireless fidelity") is a term for certain types of 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.

## Purchasing Power Parities

Country	US\$	US\$ PPP	VAT %
Australia	0.759370634	0.744481013	10.0%
Austria	1.26246686	1.158226477	20.0%
Belgium	1.26246686	1.191006472	21.0%
Canada	0.894854586	0.828569061	15.0%
Czech Rep.	0.044251762	0.072543873	19.0%
Denmark	0.169293538	0.121793912	25.0%
Finland	1.26246686	1.018118436	22.0%
France	1.26246686	1.147697146	19.6%
Germany	1.26246686	1.147697146	16.0%
Greece	1.26246686	1.402740956	19.0%
Hungary	0.004771926	0.00795321	20.0%
Iceland	0.013213796	0.008750858	24.5%
Ireland	1.26246686	0.96371516	21.0%
Italy	1.26246686	1.225695981	20.0%
Japan	0.008781482	0.00708184	5.0%
Korea	0.0010238	0.001137556	10.0%
Luxembourg	1.26246686	1.168950797	15.0%
Mexico	0.090252708	0.12711649	15.0%
Netherlands	1.26246686	1.168950797	19.0%
New Zealand	0.637840527	0.657567554	12.5%
Norway	0.162390386	0.112771102	25.0%
Poland	0.325479513	0.533572972	22.0%
Portugal	1.26246686	1.558601062	21.0%
Slovak Rep.	0.033684528	0.055220538	19.0%
Spain	1.26246686	1.372246587	16.0%
Sweden	0.135844094	0.115122114	25.0%
Switzerland	0.806887592	0.588969046	7.6%
UK	1.825217201	1.690015927	17.5%