



# International Communications Market Report 2015

## **Appendix A – Consumer research methodology**

# Appendix A: Consumer research methodology

## Introduction

This section describes the methodology used for the 2015 international communications behaviour research, which was carried out by Populus, an independent market research agency, on behalf of Ofcom.

The survey covered the communications behaviour of internet users in nine markets: the UK, France, Germany, Italy, the US, Japan, Australia, Spain and Sweden. As in previous years, the research looked at the ownership and use of communications services and devices such as TV, mobile, fixed landline and the internet. In addition, it explored the changing nature of communication, and use of connected devices, postal services, online shopping, mobile payments, and take up of 4G and superfast broadband in the various markets.

The 2015 research comprised 9,040 interviews completed between 23 September and 8 October 2015. Eight previous waves of the research have been undertaken (2014, 2013, 2012, 2011, 2010, 2008, 2007 and 2006) and a number of key issues have been tracked across all waves.

In previous years, China was included in the research, however, due to internet take-up being relatively low in China and despite the members of the online panel in China being representative of that country's online population, they were perhaps more likely to be affluent and urban and exhibit the behaviour of early adopters than were the samples from the other eight countries. It was therefore decided to replace China with Sweden in the 2015 study. This provides representation from a Scandinavian country, a region which was not represented in previous years, while the continued inclusion of Japan ensures that the Far East is represented.

## Research methodology

### Overview

The international communications behaviour research was conducted using an international online consumer access panel. In 2015, as in previous years, the research panel employed was managed by Toluna. The numbers of active panel members in each market are shown in Figure 8.1. A total of 9,040 interviews with internet users were completed – with at least 1,000 in each market. Age and gender quotas in each market were set in line with those employed in earlier waves to ensure historical consistency.

The study was carried out among adults aged over 18. Data for setting quotas for the different online panels came from a range of data sources. Where possible, data from the respective countries' statistical departments was used. This related to Spain (National Statistics Institute), Japan (Japanese Statistical Yearbook 2014), Australia (Household Use of Information Technology) and Sweden (Statistics Sweden). For two countries, data were obtained from centres of research – France (Centre de Recherche pour L'Etude et L'Observations des conditions de Vie: La diffusion des technologies de l'information et de la communication dans la société) and US (The Pew Research Centre). The German quotas came from a survey undertaken by the two largest broadcast companies – ARD/ZDF Onlinestudie 2014 and Spain from Audioweb.

Members of Toluna’s access panel were screened to meet age and gender requirements. Respondents were invited to participate using a random online sampling approach to ensure a representative sample. The following methods were used:

- Email invitation via random sampling from the panel, within qualifying age bands.
- Real-time sampling, allowing visitors to the Toluna website to access the screeners and participate (if they qualified).

Toluna sampled its panel by selecting email addresses randomly within the market and demographic quotas required, taking account of predicted response rates by target demographic, and country, to avoid over-contacting panellists and to ensure that a bias was not introduced in the responses. The sample itself was then automatically randomised for potentially-qualifying individuals. A 25-minute self-completion web-based survey was completed by all respondents in each market.

### Quotas

Quotas of 1,000 interviews per market were set to match previous waves and at least 1,000 interviews were completed per country.

The quotas had been set in the previous waves to reflect the age and gender profile of internet users in each market of consumers. For the eight countries previously surveyed, the same quotas were set this year. Quotas were set on the Swedish sample based on data obtained from Statistics Sweden. The data were weighted using proportions comparable to previous waves.

**Figure 8.1 Achieved sample, by nation and demographics**

	UK	FRA	GER	ITA	USA	JPN	AUS	ESP	SWE
Unweighted total	1006	1003	1007	1003	1009	1006	1000	1002	1004
Weighted total	1000	1000	1000	1000	1000	1000	1000	1000	1000
Male	480	490	530	530	480	550	500	510	500
Female	520	510	470	470	520	450	500	490	500
18-24 yrs	140	150	110	140	150	110	140	130	110
25-34 yrs	210	170	160	230	180	200	230	240	160
35-44 yrs	220	180	180	280	180	240	210	270	160
45-54 yrs	170	170	200	220	190	190	190	210	170
55-64 yrs	72	181	225	129	105	188	100	123	150
65+ yrs	188	149	125	1	195	72	130	27	250

### Statistical significance

Demographic quotas were employed to match internet use in each market. Results were tabulated and significance testing (at 95% confidence) was applied.

Statistical significance is indicated by the use of directional arrows on some of the figures in the report. An upward arrow indicates a significantly greater proportion and a downward

arrow indicates a significantly lower proportion (see individual figure footnotes for details of years/sub-groups being compared).

### Access panel

The 2015 survey used Toluna’s access panel. The panel includes the following number of members in each of the relevant markets:

**Figure 8.2 Toluna panel member volumes**

	UK	FRA	GER	ITA	USA	JPN	AUS	ESP	SWE
Members	409,000	387,000	283,000	220,000	2,300,000	325,000	135,000	184,000	42,000

Panel members were recruited from a variety of sources, using a ‘double opt-in’ procedure. The process was as follows:

- Step 1 - A prospective panellist completes a panel registration form, which includes contact and demographic information (first opt-in).
- Step 2 - An automatic email is sent to the prospect, requesting verification of their panel registration by clicking a link that confirms their log-in details.
- Step 3 - Once the prospect has clicked the link (second opt-in), he or she is officially a panellist and is presented with an opportunity to complete additional profiling. Another automatic email is sent that includes the panellist’s account log-in information for future reference by the panellist.

For this survey, all panellists completing the survey were paid a small incentive payment for their time



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## **Appendix B – TV viewing analysis methodology**

# Appendix B: TV viewing analysis methodology

## Introduction

This section outlines the parameters and definitions used in the broadcast TV viewing analysis, within the *TV and audio-visual* chapter.

The source for the analysis is extracted from the *One Television Year In The World 2015* report which is published by Eurodata TV Worldwide.

Data in the report are based on measured viewing, using TV meter technology.

## Overview

Eurodata TV Worldwide works with audience measurement and research organisations for each country that is included in its publication, and brings together their respective industry standard viewing data into a single annual review.

We set out the industry standard criteria for reported TV viewing in each of the comparator countries, below.

The information reflects the status and data for each country when the Eurodata TV Worldwide report was published in April 2015.

**Figure 9.1 Comparator countries and their industry audience measurement criteria**

Country	Audience base	Area	2014 date range	Type of viewing measured
UK	Individuals 4+	National	1st Jan 2014 - 31st Dec 2014	Live + viewing on the same day as live + up to 7 days time-shifted
France	Individuals 4+	National	30th Dec 2013 - 28th Dec 2014	Live + viewing on the same day as live + up to 7 days time-shifted
Germany	Individuals 3+	National	1st Jan 2014 - 31st Dec 2014	Live + viewing on the same day as live + up to 3 days time-shifted
Italy	Individuals 4+	National	1st Jan 2014 - 31st Dec 2014	Live + viewing on the same day as live + up to 7 days time-shifted
USA	Individuals 2+	National	30th Dec 2013 - 28th Dec 2014	Live + viewing on the same day as live + up to 7 days time-shifted
Japan	Individuals 4+	Kanto region (the most selected region for analysis of TV viewing in Japan but should not be considered as equivalent to nationally representative data)	1st Jan 2014 - 31st Dec 2014	Live only
Australia	Individuals 0+	A combination of regional areas to reflect national data: Queensland, Northern New South Wales (NSW), Southern NSW, Victoria and Tasmania and Regional Western Australia.	1st Jan 2014 - 31st Dec 2014	Live + viewing on the same day as live + up to 7 days time-shifted
Spain	Individuals 4+	National	1st Jan 2014 - 31st Dec 2014	Live only
Netherlands	Individuals 6+	National	1st Jan 2014 - 31st Dec 2014	Live + viewing on the same day as live + up to 6 days time-shifted
Sweden	Individuals 3+	National	1st Jan 2014 - 31st Dec 2014	Live + viewing on the same day as live + up to 7 days time-shifted
Poland	Individuals 4+	National	1st Jan 2014 - 31st Dec 2014	Live + viewing on the same day as live + up to 7 days time-shifted
South Korea	Individuals 4+	National	1st Jan 2014 - 31st Dec 2014	Live only
Brazil	Individuals 4+	15 markets - Florianópolis, Campinas, Porto Alegre, Distrito Federal (Brasília), São Paulo, Rio de Janeiro, Curitiba, Grand Belo Horizonte, Salvador, Vitória, Manaus, Goiânia, Fortaleza, Recife, Belém	1st Jan 2014 - 31st Dec 2014	Live only
Russia	Individuals 4+	National. Cities with a population greater than 100,000 inhabitants	1st Jan 2014 - 31st Dec 2014	Live only
China National	Individuals 4+	National	1st Jan 2014 - 31st Dec 2014	Live only

Source: MediaMetrie, Eurodata Worldwide

**Live** - viewing of broadcast programmes at the time of transmission.

**Viewing on the same day as live (VOSDAL)** – viewing to broadcast programmes other than at the time of broadcast but on the same day as it was aired.

**Time-shifted viewing** – for the purpose of the descriptions in Figure 9.1, time-shifted viewing is defined as viewing of broadcast programmes up to the specified number of days after live broadcast, excluding viewing on the same day as live.

Total time-shifted viewing includes VOSDAL plus any subsequent time-shifted viewing.

Time-shifted includes viewing through recording devices (such as a DVR) as well as to catch-up TV services (where applicable to the country). Viewing of catch-up through devices such as PCs and laptops, tablets and smart phones where attached to the TV set and the screen is being used to view programmes, may also be included.

Guest viewing (i.e. people who are not normally part of the household in a panel home) is included where measured by a country.





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## **Appendix C – Comparative international pricing methodology**

# Appendix C: Comparative international pricing methodology

## Introduction and objectives

For the 2015 international price benchmarking analysis we have largely used the same methodology as in previous years, and have made some updates to the household usage profiles to ensure that they more accurately reflect current use of communications services in the comparator countries.

We use a bespoke pricing model commissioned from pricing consultancy Teligen. The model is populated with specifically-sourced tariff data for fixed-line voice, mobile phone, fixed broadband, mobile broadband, television and 'bundled' services (i.e. incorporating more than one service, such as 'triple-play' tariffs) in the UK, France, Germany, Italy, Spain and the US. The key objectives of the work are as follows:

- to identify and compare the pricing that is available for consumers buying fixed-line voice services, mobile services, broadband internet and TV services;
- to identify and compare the pricing that is available by purchasing communications services within 'bundled' tariffs (for example, 'triple-play' services, which typically offer a single bill for the delivery of fixed-line voice, broadband and television services);
- to compare pricing across a wide range of service usage scenarios, from the requirements of those with basic needs to those of consumers with more sophisticated consumption;
- to incorporate the cost of hardware such as set-top boxes or mobile handsets in order to reflect the real prices that consumers pay, and to compare like-with-like by allowing for equipment subsidies when they are included within propositions from service providers; and
- to represent average or typical use as accurately as possible across the five countries in order to avoid biases associated with comparing pricing based on usage characteristics that are more typical of one country than another.

## Basic methodology

Further detail is provided below, but the basic principles are as follows. We constructed five 'typical' household types, which collectively may be seen as representative of the average population across our countries, and defined a basket of communications services (fixed-line voice, mobile, broadband, TV) appropriate for each household type. A wide range of components were included within the household usage profiles to ensure as accurate as possible a representation of the real prices consumers pay. For example:

- Fixed voice minutes were distributed by whether they were to fixed or mobile lines, by call distance (local, regional, national and international, including a range of international destinations), and time of day (day, evening, weekend). Non-geographic calls were excluded from the analysis.

- Mobile calls (and messaging) were split between on-net and off-net, and voicemail was included.
- Call set-up and per-minute charging were incorporated, and a range of call lengths were used (distributed around a defined mean based on averages across 30 OECD countries).
- Incoming calls were included, in recognition of the different pricing mechanism in the US.
- The fixed broadband component was defined both by minimum headline speed and by minimum data and time online requirements (in recognition that in some markets some broadband service providers charge by time spent online, in addition to, or in place of data-based charging).
- The mobile broadband component was defined in the same way as the fixed broadband component, although there were no minimum connection speed criteria (as services are seldom marketed in this way).

The television element included the licence fee (where applicable), a digital receiver and, for some household usage profiles, a digital video recorder (DVR). Because of difficulties in comparing programming bundles, two tiers of pay-TV were considered: the most basic service available above the channels available on free-to-air TV; and a premium service defined by a top-price film/entertainment package and the best package of top-tier football matches.

The average monthly use across all of the household usage profiles was adjusted to ensure that it was aligned with average use across the countries included in the analysis.

Mobile handsets, broadband routers, mobile broadband modems, digital set-top boxes and DVRs are included within the household usage profiles (and amortised over an appropriate period in order to attribute a monthly cost). This is necessary because this equipment is often inseparable from the service price, as operators frequently include subsidised or 'free' equipment (for example a mobile handset or a WiFi router) within the monthly subscription. For similar reasons, connection and/or installation costs are included.

In July 2014 and July 2015, details of every tariff and every tariff combination (including bundled services) were collected from the largest three operators in each country by retail market share (and from more than three operators, if this was required to ensure that a minimum of 80% of the overall market was represented). Bundled tariffs (i.e. those which incorporate more than one service) were also collected. Only those tariffs available on the websites of the operators were included (i.e. the analysis excludes bespoke tariffs which are offered only to certain customers).

Across the six countries, the tariff data in 2015 consisted of:

- 443 fixed voice tariffs;
- 342 fixed broadband tariffs;
- 3,202 mobile tariffs;
- 623 mobile broadband tariffs;
- 484 television tariffs; and

- 10,240 bundled tariff options.

Our model identifies the tariffs that offer the lowest price for meeting the requirements of each household. All sales taxes and surcharges have also been included, in order to reflect the prices that consumers actually pay (although we do not account for differences in other areas of personal taxation policy within each country), and all prices are converted back to UK currency using a purchasing power parity (PPP) adjustment based on OECD comparative price levels and exchange rates as of 1 July 2015.

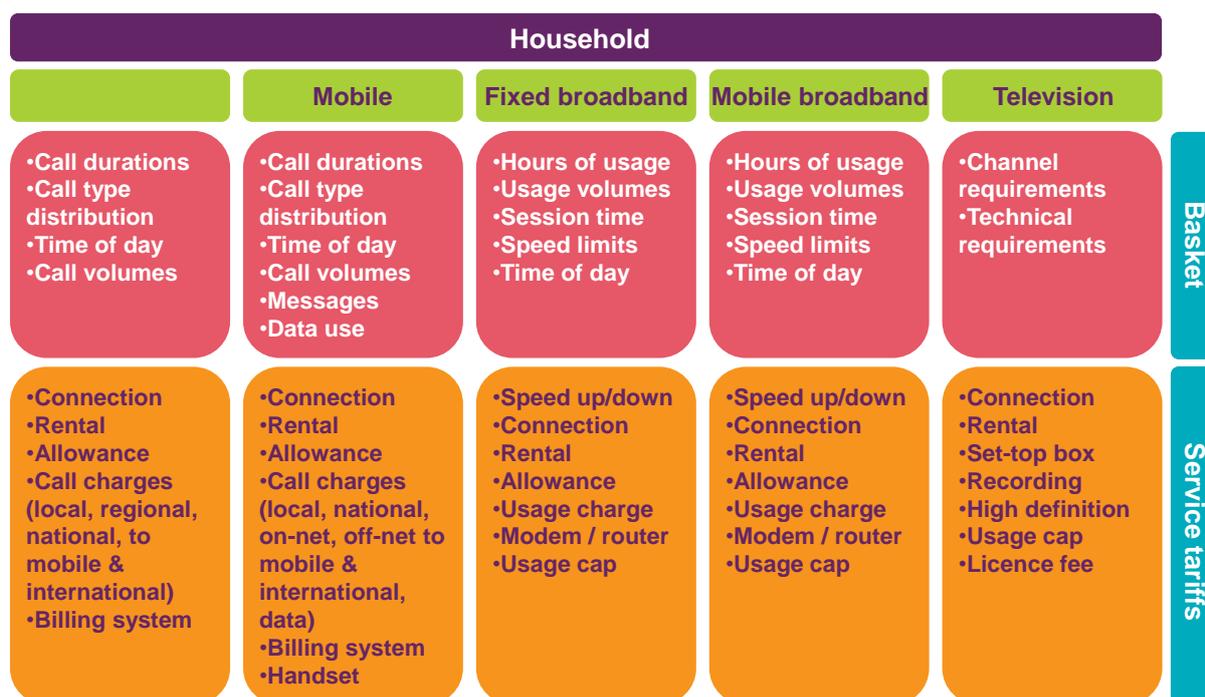
In order to provide an illustration of representative prices for the individual services in each country, and an illustration of the best value that consumers could get for their full 'basket' of services, we have provided three types of analysis for each household usage profile:

- The first, which we call 'average stand-alone' pricing, illustrates the price of each individual service, as defined by the average of the lowest price tariff from each of the operators for each service in each country, weighted by the market share of the service provider in order to ensure fair representation.
- The second, which we call 'average bundle' pricing is the average of the lowest bundled service prices (including separate stand-alone services where a bundle does not include all of the services required by the household) offered by each operator that provides a suitable bundled tariff in each country, weighted by their fixed broadband market shares. This is the first time that this analysis has been included in these reports, and it should be noted that fixed broadband shares are used to weight the results, regardless of whether or not the household in question requires a fixed broadband service.
- The third, which we call 'lowest available' pricing, identifies the lowest price a consumer could pay for this basket of services, including, where appropriate, by purchasing 'bundled' services.

### **Principles of the model**

The model developed for Ofcom by Teligen uses individual consumption baskets for each of the services in the pricing analysis, combined in a structure that allows the definition of household usage profiles of any combination of services.

**Figure 10.1 Components of the pricing comparison model**



Source: Teligen

Each household usage profile may include any of the four services, with any combination of basket parameters, describing the use of each service within the household. For the mobile service the system allows definitions of multiple users, for each member of the household. The tariff information contains all charges and elements that will typically be part of a service offering. Some costs have been excluded as beyond the scope of the current analysis:

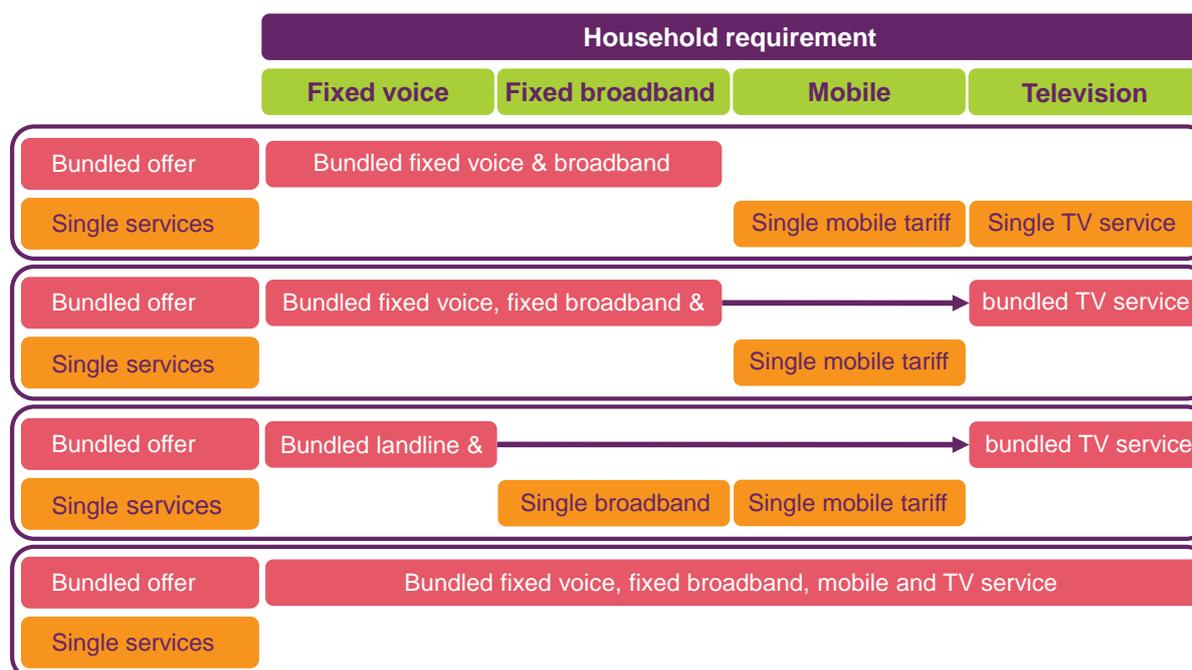
- PC/laptop/s for use with the broadband service
- Television set/s
- Recording equipment beyond those built into digital decoders
- Fixed telephone handset/s

However, mobile handsets, modems/routers and set-top boxes/TV receivers are included as they are an integral part of the service offerings, and are often subsidised by operators who recoup the value of the hardware throughout the course of a contract.

### Bundled service offerings

An important part of the analysis is the inclusion of the 'bundled' service offers available in each of the study countries, whereby more than one service is purchased from a stand-alone provider, often at a discount compared with purchasing the services separately. As the household definition determines which services are required by the household, and as this may or may not correspond with the bundled offerings available, it is necessary to combine the bundled offerings with the available stand-alone tariffs in each market. Where the bundled offer does not cover the household requirement for a particular service, a suitable stand-alone tariff is used to fill the gap. In such cases the best possible tariff (the cheapest stand-alone offer that can fulfil the usage requirements) is used.

**Figure 10.2 Examples of combinations of bundled and stand-alone offers**



Source: Teligen

### Geographic scope

We made pricing comparisons between six countries – the UK, France, Germany, Italy, Spain and the US. These countries have broadly similar socio-demographic, economic and communications-use characteristics. High-level parameters such as population per household and comparative price levels (which is a proxy for cost of living) suggest that fair comparison can be made more easily, as relative prices are not substantially influenced by differences in economic development.

Because of the existence of local markets in the US, we have used tariffs available in the state of Illinois. This was chosen as being reasonably representative of the US as a whole in terms of its relative wealth and rural-urban split. Nevertheless, US pricing should not be viewed as being representative of the whole country.

**Figure 10.3 Demographic characteristics and relative price levels across countries**



Source: OECD / IMF / US census bureau

## Tariff data

For practical reasons, it was not possible to incorporate every tariff from all of the operators in every country. Instead, we set a requirement that the analysis included the three largest operators by retail market share for each service and represented at least 80% of the retail market. Therefore, in markets where the three largest operators had collective market share of over 80%, we limited our analysis to tariffs from these three operators; otherwise we included the fourth and fifth largest operators to ensure that we represented a minimum of 80% of the market. All the operators included by these criteria were also considered for 'bundled' offers. While this methodology excludes smaller operators, which may offer the lowest prices for some services, we believe that using the prices of the largest operators is appropriate, both because they are the best reflection of the general consumer experience and because they are in large part defined by the competitive environment in which they operate.

Research was undertaken in July of each year from 2008 to 2015, and only those tariffs detailed on the websites of the operators were included. Special offers and promotions (for example, reduced line rental for a number of months, or 'free' installation or hardware) were included, but only if they were available to all new customers and were available for the whole month.

## Household types

For this study we make reference to five hypothetical 'typical' households, and have defined their requirements for communications services. These household types are designed to be collectively broadly representative of the overall population of the five countries; although in order to provide comparison across the full range, from very basic to advanced communications-service users, we have created significant variation in the contents of the baskets of communications services. The details of the household usage profile composition are provided in Section 2 above.

**Figure 10.4 Household types**

'Typical' household type		Summary	Fixed voice	Mobile voice	Mobile messaging	Mobile handset data	Fixed line broadband	Mobile broadband	Television
1	Basic needs	A low use household with basic needs	Medium use	Low use	None	None	None	None	Free-to-air
2	Late adopters	A broadband household with basic needs	High use	Low use	Low use	Low use	Low use	None	Free-to-air
3	A mobile 'power user'	A mobile-only household	None	High use	High use	High use 4G	None	High use	Basic pay-TV with DVR
4	Connected family	A family household with multiple needs	Medium use	Medium use	High use	Medium use	Medium use	None	Basic pay-TV with HD & DVR
5	Sophisticated couple	An affluent two person household	Low use	Medium use	Medium use	Medium use	High use superfast	None	Premium pay-TV with HD & DVR

Source: Ofcom

## Fixed-line voice services

### Fixed-line tariff information

The fixed voice service is assumed to be a home-based fixed telephony service. A household is assumed to have no more than one fixed-line service.

Single fixed-voice services are normally offered on a dedicated analogue line (PSTN services). In the context of bundled services, the fixed voice service may be delivered as a VoIP telephony service over a broadband connection, and these are included in our analysis. From a user point of view, these services are exchangeable, but from a technical point of view they are very different. As connection and line rental charges are covered by the broadband service, the bundled fixed voice services can have zero or very small fixed charges over and above the broadband charges.

Typically, fixed-voice tariffs incorporate some or all of the following types of charging:

- Connection charge and takeover charge.
- Monthly rental charge, plus the monthly charge for any additional options taken.
- Allowances in terms of minutes included per month, or a value deducted from use each month. These allowances are mapped onto the different types of calls and times of day.
- Billing system information.
- Call charges for day, evening and weekend:
  - Local calls
  - Regional calls
  - National calls
  - Calls to mobiles (for each network, weighted)
  - International calls to ten destinations

As such, calls to non-geographic numbers are excluded from the analysis.

The billing system information is used to determine the price elements included in a typical call. Seven types of billing are possible.

### Figure 10.5 Types of billing for fixed voice calls

Calculation types	
1	Per second
2	Per unit
3	Per minute
4	Per second with allowance
5	Per second with initial minute
6	Per second capped
7	Per minute capped

Source: *Teligen*

Each tariff is handled individually, and will have the most appropriate call cost calculation system applied.

### Fixed voice basket

The fixed voice basket defines the use per month for the household, and calculates the monthly cost of using the fixed voice service. The basket elements are listed below, with values for each of the five households. The cost of customers' equipment is amortised over a five-year period.

**Figure 10.6 Components of the fixed voice baskets**

	Basket 1	Basket 2	Basket 3	Basket 4	Basket 5	Units
<b>Call durations</b>						
Local	4	4	n/a	4	4	Mins
Regional	6	6	n/a	6	6	Mins
National	6	6	n/a	6	6	Mins
Fixed to mobile	2	2	n/a	2	2	Mins
International	6	6	n/a	6	6	Mins
<b>Destination weights</b>						
Local	67	70	n/a	68	67	%
Regional	10	8	n/a	9	10	%
National	16	13	n/a	14	16	%
Fixed to mobile	7	7	n/a	7	7	%
International	0	2	n/a	2	0	%
<b>Time of day weights</b>						
Day	58.3	58.3	n/a	59.2	58.3	%
Evening	24.5	24.5	n/a	24.9	24.5	%
Weekend	17.2	17.2	n/a	15.9	17.2	%
<b>Depreciation</b>	5	5	5	5	5	years

Source: Teligen

Note: All fixed call types are calculated with five different durations, below and above the number of minutes indicated.

International calls are weighted according to the table below, considering each originating country and each destination country.

**Figure 10.7 Fixed voice international call destinations for comparator countries**

		Call to									
		CAN	FRA	GER	ITA	JPN	RUS	SAF	ESP	UK	USA
Call from	CAN		2.2%	2.1%	1.7%	1.0%		0.3%		6.5%	86.2%
	FRA	2.8%		25.2%	19.0%	1.4%			13.7%	24.7%	13.2%
	GER	2.7%	21.6%		20.0%	1.7%	2.3%	0.8%	8.6%	20.4%	22.0%
	ITA	3.4%	26.5%	30.3%		1.0%			7.0%	15.6%	16.2%
	JPN	4.4%	5.0%	6.8%	2.5%		1.6%		1.1%	11.5%	67.1%
	RUS	2.2%	8.8%	35.1%	11.8%	2.0%			3.4%	10.6%	26.1%
	SAF	4.4%	5.0%	13.9%	4.4%	1.8%				46.7%	23.7%
	ESP	0.8%	27.6%	23.8%	11.2%	0.7%	0.7%	0.2%		24.0%	10.9%
	UK	6.2%	18.1%	19.5%	8.7%	2.8%		2.7%	8.0%		34.0%
	USA	47.9%	5.6%	12.2%	4.6%	8.7%	1.3%	0.8%	2.2%	16.7%	

Source: Teligen

Note: Vertical axis is the originating country and horizontal is the destination country.

## Basket logic

Once the cost of using each fixed voice package is calculated, the cheapest package per provider and per country is identified. These are the packages that are considered in the household cost scenarios. The packages that are part of a bundled offering are identified separately from the single packages.

## Fixed voice data issues

Fixed voice services are covered with both direct and indirect services. Any line installation or monthly rental charges incurred by those using indirect services are included in the service costs. Some providers offer a wide range of add-on options for their tariff packages, with possible cost reductions. Where relevant, these have been incorporated in order to identify the lowest prices available for a basket of services.

## Mobile services

### Mobile tariff information

The mobile service is assumed to be a personal service; a household may have several users with individual usage profiles and requirements. VoIP over mobile networks' services were excluded from the analysis. Typically, the mobile tariffs will use some or all of the following charge categories:

- Connection charge.
- Monthly rental charge, plus the monthly charge for any additional options taken.
- Allowances in terms of call minutes and/or messages included per month, or a value deducted from usage each month. These allowances are mapped onto the different types of calls and times of day.
- Billing system information.
- Call charges for day, evening and weekend:
  - Local calls
  - National calls
  - On-net calls to mobiles
  - Off-net calls to mobiles (for each network, weighted)
  - Voicemail calls
  - International calls to ten destinations
- Data use and technology (3G/4G)
- Messages.

The billing system information is used to determine the price elements included in a typical call. Seven types of billing are possible:

**Figure 10.8 Types of billing for mobile voice calls**

Calculation types	
1	Per second
2	Per unit
3	Per minute
4	Per second with allowance
5	Per second with initial minute
6	Per second capped
7	Per minute capped

Source: Teligen

Each tariff is handled individually, and will have the most appropriate call calculation system applied.

### Mobile basket

The mobile basket defines the use per month for the user, and calculates the monthly cost of using the mobile service. The basket elements are listed below, with values for some of the typical user types. Mobile handsets were assumed to have a three-year life.

**Figure 10.9 Components of the mobile baskets**

	Basket 1	Basket 2	Basket 3	Basket 4				Basket 5		
	Users 1&2	Users 1&2	User 1	User 1	User 2	User 3	User 4	User 1	User 2	
<b>Call durations</b>										
Local	1.5	1.5	1.7	1.8	1.8	1.5	1.5	1.7	1.8	Mins
National	1.5	1.5	1.7	1.8	1.8	1.5	1.5	1.7	1.8	Mins
On-net	1.6	1.6	1.9	1.9	1.9	1.6	1.6	1.9	1.9	Mins
Off-net	1.4	1.4	1.8	1.7	1.7	1.4	1.4	1.8	1.7	Mins
Voicemail	-	-	1	1	1	1	1	1	1	Mins
International	2	2	2	2	2	2	2	2	2	Mins
<b>Destination weight</b>										
Local	16	16	8	11	13	20	20	13	20	%
National	8	8	5	6	7	10	10	7	10	%
On-net	38	38	37	33	34	30	30	29	30	%
Off-net	38	38	37	33	34	30	30	29	30	%
Voicemail	0	0	7	7	12	10	10	8	10	%
International	0	0	6	10	0	0	0	14	0	%
<b>Time of day weight</b>										
Day	48	48	60	50	50	48	48	60	50	%
Evening	25	25	19	24	24	25	25	19	24	%
Weekend	27	27	21	26	26	27	27	21	26	%

Source: Teligen

Notes: All mobile call types are calculated with five different durations, below and above the number of minutes indicated.

International calls are weighted according to the table below, considering each originating country and each destination country.

**Figure 10.10 Mobile voice international call destinations for comparator countries**

		Call to									
		CAN	FRA	GER	ITA	JPN	RUS	SAF	ESP	UK	USA
Call from	CAN		2.2%	2.1%	1.7%	1.0%		0.3%		6.5%	86.2%
	FRA	2.8%		25.2%	19.0%	1.4%			13.7%	24.7%	13.2%
	GER	2.7%	21.6%		20.0%	1.7%	2.3%	0.8%	8.6%	20.4%	22.0%
	ITA	3.4%	26.5%	30.3%		1.0%			7.0%	15.6%	16.2%
	JPN	4.4%	5.0%	6.8%	2.5%		1.6%		1.1%	11.5%	67.1%
	RUS	2.2%	8.8%	35.1%	11.8%	2.0%			3.4%	10.6%	26.1%
	SAF	4.4%	5.0%	13.9%	4.4%	1.8%				46.7%	23.7%
	ESP	0.8%	27.6%	23.8%	11.2%	0.7%	0.7%	0.2%		24.0%	10.9%
	UK	6.2%	18.1%	19.5%	8.7%	2.8%		2.7%	8.0%		34.0%
	USA	47.9%	5.6%	12.2%	4.6%	8.7%	1.3%	0.8%	2.2%	16.7%	

Source: Teligen

Note: Vertical axis is the originating country and horizontal is the destination country.

The internet traffic is defined both as megabytes of download volume and minutes of use, as tariffs may be charged according to either of these two methods. Handsets are defined in three categories:

- Basic: 2.5G or basic 3G, above 2MP camera, + MP3 player / FM radio
- Mid-range: 3G smartphone
- High-end: 3G/4G smartphone.

### Basket logic

Once the cost of using each mobile package is calculated, the following checks take place:

- Does the package include a handset, or can a suitable handset be included with the package? If not, the cost of a suitable handset, amortised over three years, will be added to the package's monthly usage cost.
- If the basket assumes an amount of data traffic, the package must also be able to offer this. If not, the package will not be considered. In such instances the handset must be compatible with data services.

Then the cheapest package per provider and per country is identified. These are the packages that will be considered in the household cost scenarios. The packages that are part of a bundled offering will be identified separately from the single packages.

### Mobile service data issues

Although the model allows for pre-pay and post-pay services to be considered separately, we have not defined whether the mobile phone component in a basket is pre-pay or post-pay. We believe this enables better international comparison, given the very different pre-pay/post-pay splits in different countries (for example, around 90% of Italian mobile connections are pre-pay, while around 90% of US mobile connections are post-pay). However, a consequence of this is that the analysis does not recognise the different characteristics of the services; for example, a pre-pay mobile may be the only option available to consumers with a poor credit rating, and may also offer advantages to those who vary their use month by month.

Allowances or 'free' minutes/ messages/ data are included in the tariffs, and are treated as similarly to the billing system principles as possible (e.g. per-minute or per-second charging). The deduction of minutes and messages will follow the traffic weights defined by the basket profiles.

## **Broadband services**

### **Broadband tariff information**

The broadband services covered may be on any platform typical for home use; the most common are ADSL, cable and fibre. Mobile broadband is included as a separate requirement to fixed broadband for one household basket. Tariffs are categorised by headline speed. Typically, broadband tariffs use some or all of the following charge categories:

Connection charge.

Installation charge, for either self install or engineer install (the cheapest solution is used).

- Purchase price for modem, and possibly router.
- Any specific connection charges paid to the incumbent operator.
- Monthly rental for broadband service.
- Possibly, a monthly price for modem and router rental.
- Any specific rental charges paid to the incumbent operator:
  - Usage time allowance
  - Usage time limit
  - Usage time charge (per minute or hour beyond allowance)
  - Usage data volume allowance
  - Usage data technology for mobile services (3G/4G)
  - Usage data volume limit
  - Usage data volume charge (per MB or GB beyond allowance)
  - Maximum cost per month

### **Broadband basket**

The broadband basket is relatively simple, and basically calculates the monthly cost of using a broadband service in a home environment. The basket parameters are generally given per month. The values below are related to the five defined households.

**Figure 10.11 Components of the broadband baskets**

	Basket 1	Basket 2	Basket 3	Basket 4	Basket 5
Type of service	n/a	Fixed	Mobile	Fixed	Fixed
Usage time (hours/month)	n/a	100	160	300	500
Usage volume (GB/month)	n/a	25	5	50	75
Session duration (mins)	n/a	20	20	20	20
Minimum speed (Mbit/s)	n/a	5	n/a	10	30
Usage in daytime (%)	n/a	30	30	30	30
Usage in evening (%)	n/a	40	40	40	40
Usage at weekend (%)	n/a	30	30	30	30
Depreciation (years)	n/a	3	1	3	3

Source: Teligen

The 'up to' advertised 'speed of each tariff package is checked against the usage volume, and if the speed is too low to accommodate the traffic indicated, the tariff is excluded from the analysis. The speed of each tariff package is checked against the speed range required by the basket, and if the speed is outside this range the tariff is excluded from the analysis. If the tariff package has a penalty for excess use whereby the speed delivered is 'throttled', the tariff is excluded from the analysis once this penalty takes effect. The resulting cost is presented as connection/set-up cost, rental and use.

- The monthly connection/set-up cost is the sum of all one-off charges (including any discount/promotions), amortised over three years.
- The rental cost is the sum of all monthly charges.
- The usage cost is calculated from any per-minute or per-MB charges. The session durations and usage volumes of the baskets are used for this calculation, along with any time or volume allowances.

### Basket logic

Once the cost of using each package is calculated, the following checks take place:

- If the package uses a limiting mechanism that will take effect when the allowance is exceeded, the status of this limit has to be checked. If it turns out that the package is not able to accommodate the traffic defined in the basket within this allowance, and that download speed will be limited as a result, the package cannot be considered.
- If the download speed of the package is outside the range defined by the basket, the package will not be considered.
- The basket will define whether a fixed or wireless package is used, and this will also be checked.
- The resulting total monthly cost of the remaining packages will be compared, and the cheapest package from each provider and also for each country will be identified.

## Broadband data issues

Broadband services of different types are covered: ADSL, cable and fibre as well as wireless. The bitrates used are the headline 'up to' speeds published by the provider, not considering any speed reductions caused by local circumstances. Only the download speed is considered, although the upload speed is also covered. Where available, the prices for both self-installation and engineer installation are covered. However, in some cases only one of these may be available. The cheapest option is always used.

It is common to have special offers with reduced rental for the first few months. This is included wherever it applies, given that the promotional offer is valid in the month of tariff data collection (July 2014 and July 2015). The monthly rental is then averaged over the depreciation period of three years. The research shows that some providers will only offer broadband services bundled with other services, as a bundled package. Hence there will not always be stand-alone offers for all providers listed.

## Television services

### Television tariff information

Television services are probably those where there is most variance between the countries in terms of services' description and quality. In this benchmarking study the television services covered fall into three categories:

- Basic service with a range of free-to-air channels.
- Basic pay-TV service, with a basic set of channels beyond the free-to-air channels.
- Premium service, based on the provider's top-of-the-range offering, including top league football/NFL matches and a top-price film/entertainment package.

Two additional parameters will be considered:

- Whether or not a digital recording (DVR) facility is included in the set-top box.
- Whether or not high definition (HD) services are included.

The basket definitions below will show how these parameters are defined for each of the households.

Television services will cover the most relevant offerings from each provider based on the two broad definitions above. Typically, television tariffs will use some or all of the following charge categories:

- Connection charge.
- One-off charges for the set-top box (STB) and digital video recorder (DVR).
- Monthly rental for basic television service.
- Monthly rental for additional channel packages.
- Monthly rental for hardware (STB, DVR).
- Licence fee.

The cost of the TV set is excluded from the analysis.

## Television basket

The television basket is relatively simple, and calculates the monthly cost of having the relevant channel package, together with the cost of installation and/or equipment amortised over three years. The basket parameters are generally given per month. The values below are related to the five defined households.

**Figure 10.12 Components of the television baskets**

	Basket 1	Basket 2	Basket 3	Basket 4	Basket 5
Free-to-air or pay-TV	Free-to-air	Free-to-air	Pay-TV	Pay-TV	Pay-TV
HD capable	No	No	No	Yes	Yes
DVR included	No	No	Yes	Yes	Yes
Football channels	No	No	No	No	Yes
Movie channels	No	No	No	No	Yes
Depreciation	3	3	3	3	3

Source: Teligen

## Basket logic

Once the charges for using each television package are calculated, the following checks take place:

- Is the number of channels offered in the package equal to or above the minimum number of channels defined in the basket?
- Is HD capability required by the basket and offered by the package?
- Are a top price film/entertainment package and top-level football / NFL required by the basket and offered by the package?

If any of these are answered with a “no”, the package will not be considered. The cheapest package is identified for each provider and for each country, and these are used in the household cost assessment.

## Television data issues

The television data have been limited to packages offering channels that are within the basket definition, largely resulting in three categories of offers:

- Basic ‘free-to-air’ packages over a digital transmission network.
- Basic pay-TV access with no special programme requirements.
- HD premium pay-TV access, including premium channels with a top-price film/entertainment package and top-level football/NFL matches. This option requires hardware with a DVR capability.

A vast number of optional offers exist, and it is not feasible to cover them all.

## Purchasing power parity adjustment

All prices have been converted back to UK currency, using a purchasing power parity (PPP) adjustment based on OECD comparative price levels in July 2015 and exchange rates as at 1 July 2015. Comparative price levels represent the number of specified monetary units necessary to buy the same representative basket of consumer goods and services, relative to any specified country (in this case, the UK), and enable a comparison of relative consumer pricing for any product or service.

In addition, in order to ensure that the changes we identify within countries have been driven by changes in the market, rather than simply by changes in the currency exchange rate, we have used the exchange rate used for 2014 and applied it to 2013 data.

**Figure 10.13 Purchasing power parity conversion rates**

Country	Currency	Exchange rate August 2013 to July 2014 (£)	Comparative price level (July 2014)	PPP adjusted rate (£)
UK	GBP (£)	1.00	100.00	100.00
FRA	EUR (€)	1.41	80.33	112.99
GER	EUR (€)	1.41	75.41	106.07
ITA	EUR (€)	1.41	75.41	106.07
ESP	EUR (€)	1.41	68.03	95.70
USA	USD (\$)	1.57	81.97	128.93

Source: Teligon, using OECD data

## Analysis

Having identified the lowest prices for each single service from each of the three largest operators in each country, and the lowest-price 'bundled' services appropriate to meet the needs of all, or part of, each basket, we performed two types of analysis, which are detailed in the write-up of the findings:

- The 'average stand-alone' price for each of the components in every household usage profile (fixed-line voice, broadband, post-pay mobile, pre-pay mobile, pay TV). This was calculated as the average of the lowest-price tariffs from every provider of each service in each country, weighted by the market share of the service provider in order to ensure fair representation.
- The 'average bundle' price for each household usage profile. This is calculated as the average of the lowest-price tariffs from every provider of suitable bundled services in each country (plus separate stand-alone services where a bundle does not include all of the services required by the household), weighted by their fixed broadband market shares. It should be noted that fixed broadband shares are used to weight the results regardless of whether or not the bundles in question include fixed broadband.
- The 'lowest available' price available for each household. This identifies the lowest price that a consumer could pay for this basket of services, including, where appropriate, by purchasing 'bundled' services. This was calculated by identifying the lowest price from any tariff for each component of every basket, together with the lowest-price bundled services suitable for the basket, and identifying the overall lowest price available.

We believe all three types of analysis are important for providing an overall understanding of comparative pricing.

Stand-alone pricing provides a useful comparison of the relative costs of communications services, and, because it is an average weighted by market share, it provides a good indication of the prices that many consumers are actually paying. However, an important limitation is that stand-alone offers are sometimes not available from leading suppliers. For example, in the UK, TalkTalk offers broadband only with its fixed-voice service.

We believe the inclusion of 'average bundle' and 'lowest available' pricing is also essential to understand the pricing of communications services, which are increasingly being delivered as multi-service propositions (examples in the UK include TalkTalk and Sky's triple-play offers which provide TV, fixed voice and fixed broadband, and Virgin Media's quad-play offer which includes TV, fixed voice, fixed broadband and mobile). However, a limitation is that 'bundled' service offerings are typically not available to all consumers, as they are generally geographically confined to areas where premises are connected either to a cable network or to an unbundled telephone exchange. And although focusing on the 'lowest available' provides insight into the lowest prices available to some customers, it is not as good a reflection of the prices that consumers are actually paying as the 'weighted average' analysis that is possible when looking at stand-alone pricing.

## Limitations

One of our key learnings in constructing international price comparison models is that it is a very problematic exercise, which requires assumptions to be made and imposes 'like-for-like' comparisons on markets that are very different. In future years, we will look to continue to improve our methodology, and we welcome any feedback on the research.

We highlight the following limitations to the analysis:

- The analysis assumes a systematic and rational consumer who has a full understanding of his or her usage requirements and is prepared to shop around and undertake some often quite complex calculations to identify the tariff which offers the best value. In reality, few consumers act in this way and will be on the lowest-cost combination of services for their usage profile, but we believe the assumption is necessary in order to provide effective international comparisons.
- In looking only at tariffs offered by the largest operators in each country, lower prices which might be available from smaller operators seeking to disrupt markets are not included, purely for practical reasons. Nevertheless, we believe that using the prices of the largest operators is appropriate, both because they are the best reflection of the general consumer experience and because their pricing both defines and is defined by the competitive environment in which they operate.
- Although we have been as comprehensive as possible, tariffs are often highly complicated and there are some components that we have been unable to incorporate into our model; for example, benefits that are available only to certain types of consumers, such as *BT Basic* which offers lower-price line rental to consumers on income support, and differing levels of customer service.
- In order to calculate the weighted average, we have used market share calculations based on operators' retail customers. Market share calculations are based on the overall subscriber base, not the subscriber base for the particular tariff (for which figures are not available).

- Pay-TV services are a component of three of the baskets we examine. However, it has not been possible to compare like-for-like subscriptions, principally because of differences in the composition of basic and premium channels across the six countries. As a consequence, quantitative comparison of international TV pricing is arguably less meaningful than for telecoms services. This is also an issue in the pricing of 'triple-play' services, where there is a wide variation in the types of TV content.
- For television services in some countries there are only two operators with nationwide coverage and/or significant market share (or only one, for some premium TV offerings). In these instances, we have identified the best-value tariff from each of them and calculated a blended average based on their market shares.
- Some services are not available nationwide. This is particularly true for services which are available only where local exchanges have been unbundled, and for IPTV, which requires a high-speed broadband connection, but is also true for cable TV and all types of broadband.
- We do not define whether the mobile phone component in a household usage profile is pre-pay or post-pay. We believe this enables better international comparison, given the very different pre-pay / post-pay splits in different countries (for example, over 75% of mobile connections in Italy, but less than 20% in France, are pre-pay). However, a consequence of this is that the analysis does not recognise the different characteristics of the services; for example, a pre-pay mobile may be the only option available to consumers with a poor credit rating and may also offer advantages to those who vary their use month by month.
- Representative pricing in the US as a whole is difficult, due to large regional variations as a result of local incumbent telco operators and cable operators offering localised prices for fixed-line services. We use only those tariffs available within the state of Illinois, chosen because it is broadly representative of the US as a whole in terms of its relative wealth and rural-urban split (it incorporates the city of Chicago as well as large agricultural regions). Nevertheless, US pricing should not be viewed as representative of the whole country.
- In order to ensure that the changes we identify within countries have been driven by changes in the market rather than simply by changes in the currency exchange rate, we have used the same PPP-adjusted exchange rate in 2015 and applied it to 2014 data. This means that there may be some distortions in the relative positions of countries compared to the findings in the 2014 report. The prices quoted are in nominal terms.





# International Communications Market Report 2015

## **Glossary and Table of Figures**

# Glossary

**2.5G** In mobile telephony, 2.5G protocols extend 2G systems to provide additional features such as packet-switched connections (GPRS) and higher-speed data communications.

**2G** Second generation of mobile telephony systems. Uses digital transmission to support voice, low-speed data communications, and short messaging services.

**3.5G** Refers to evolutionary upgrades to 3G services, starting in 2005-2006, that provide significantly enhanced performance. High Speed Downlink Packet Access is expected to become the most popular 3.5G technology (see HSDPA).

**3DTV** Three-dimensional television. A television viewing system whereby a 3D effect is created for the viewer. The 3D image is generated using red and blue colour tints on two overlaid images intended for left and right eye. Some forms of 3D TV can involve the viewer wearing glasses (stereoscopic) but more advanced systems do not require glasses (auto-stereoscopic).

**3G LTE** See LTE

**3G** Third generation of mobile systems. Provides high-speed data transmission and supports multimedia applications such as full-motion video, video-conferencing and internet access, alongside conventional voice services.

**4G** The fourth generation of mobile phone mobile communication technology standards, which provides faster mobile data speeds than the 3G standards that it succeeds.

**802.11** see Wireless LANs (WiFi)

**Access** Allowing other companies operating in the postal market, or other users of postal services, to use Royal Mail's facilities for the partial provision of a postal service.

**Access network** An electronic communications network which connects end-users to a service provider; running from the end-user's premises to a local access node and supporting the provision of access-based services. It is sometimes referred to as the 'local loop' or 'last mile'.

**Active audience** – the total number of people who visited any website or used any internet connected application at least once in a given month.

**ADSL** Asymmetric digital subscriber line. A digital technology that allows the use of a standard telephone line to provide high-speed data communications. Allows higher speeds in one direction (towards the customer) than the other.

**ADSL2+** A technology which extends the maximum theoretical downstream data speed of ADSL from 8Mbit/s to 24Mbit/s/

**ADSL Max** BT's range of commercial ADSL services.

**ADS-RSLs** Audio distribution systems restricted service licences. These licences are issued for broadcast radio services using spectrum outside the 'traditional' broadcast bands (i.e. FM and AM). Typically offering commentary and other information for attendees within a stadium or venue on specially-designed radio receivers for sale at the event (as they do not use standard broadcast frequencies).

**Alternative operator** Refers to service providers, usually in telecoms, other than the incumbent (or established) operator/s (see incumbent operator/s).

**AM** Amplitude modulation. Type of modulation produced by varying the strength of a radio signal. This type of modulation is used by broadcasters in three frequency bands: medium frequency (MF, also known as medium wave (MW)); low frequency (LF, also known as long wave (LW)), and high frequency ((HF, also known as short wave (SW)). The term AM is also used to refer to the medium frequency band (see MF, below).

**ARPU** Average revenue per user. A measurement used by pay-television or mobile companies to indicate the average monthly revenue earned from a subscriber.

**Asynchronous transfer mode (ATM)** A networking technology designed to handle high data volumes and low-latency content such as real-time voice and video.

**ATT** Analogue terrestrial television. The television broadcast standard that all television industries launched with. Most countries in this study are planning to phase out ATT in the next ten years.

**BARB** Broadcasters' Audience Research Board. The pan-industry body that measures television viewing in the UK.

**Bit-rates** The rate at which digital information is carried within a specified communication channel.

**BitTorrent** A peer-to-peer file sharing protocol which uses 'trackers' on websites to index content and is used by a number of BitTorrent clients to download and upload content.

**Blog** Short for weblog. A weblog is a journal (or newsletter) that is frequently updated and intended for general public consumption. Blogs generally represent the personality of the author or the website.

**Bluetooth** Wireless standard for short-range radio communications between a variety of devices such as PCs, headsets, printers, mobile phones, and PDAs.

**Broadband** A service or connection generally defined as being 'always on' and providing a bandwidth greater than narrowband.

**Bulk mail** High volumes of mail sent in one posting, typically of the same format and weight and often sorted to a predetermined level before being handed to the operator

**CAGR** Compound Annual Growth Rate. The average annual growth rate over a specified period of time. It is used to indicate the investment yield at the end of a specified period of time. The mathematical formula used to calculate  $CAGR = (\text{present value}/\text{base value})^{(1/\#\text{of years})} - 1$

**Catch-up TV** Usually refers to services that allow consumers to watch or listen to content on a non-live basis after the initial broadcast.

**Communications Act** Communications Act 2003, which came into force in July 2003.

**Connected TV** Any television set connected to the internet either directly (such as a smart TV) or via another device such as a set-top box, video game console or other internet-enabled devices.

**Contention ratio** An indication of the number of customers who share the capacity available in an ISP's broadband network. Figures of 50:1 for residential broadband connections and 20:1 for business are typical).

**CPS** Carrier pre-selection. 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 with

whom they have a contract. CPS does not require the customer to dial a routing prefix or use a dialler box.

**DAB** Digital audio broadcasting. A set of internationally-accepted standards for the technology by which terrestrial digital radio multiplex services are broadcast in the UK.

**Data packet** In networking, the smallest unit of information transmitted as a discrete entity from one node on the network to another.

**DCMS** Department for Culture, Media & Sport

**Delivery office** A facility serving a defined geographical area where postal packets are prepared for final delivery

**Digital audience** The active audience across laptop/desktop computers and mobile phones.

**Digital Britain** The government report, published in June 2009, outlining a “strategic vision for ensuring that the UK is at the leading edge of the global digital economy”.

**Digital broadcast radio** Uses digital technology to transmit radio services. This includes the DAB set of internationally-accepted standards, plus other technologies such as HD radio and Integrated Services Digital Broadcasting (ISDB).

**Digital switchover** The process of switching over the analogue television or radio broadcasting system to digital.

**Direct mail** Addressed advertising mail

**DMB** Digital mobile broadcasting. A variant of the DAB digital radio standard for mobile TV services, and an alternative to DVB-H (see DVB, below).

**Dongle** A physical device, attached to a PC's USB port, which adds hardware capabilities.

**Downstream access** Access to Royal Mail's postal network at an inward mail centre or at any point in the postal chain after that.

**Downstream** The activities of inward sortation and delivery.

**DRM** Digital rights management. The technology that controls access and use of digital content.

**DSL** Digital subscriber line. A family of technologies generally referred to as DSL, or xDSL, capable of transforming ordinary phone lines (also known as 'twisted copper pairs') into high-speed digital lines, capable of supporting advanced services such as fast internet access and video on demand. ADSL, HDSL (high data rate digital subscriber line) and VDSL (very high data rate digital subscriber line) are all variants of xDSL).

**DTR** See DVR

**DTT** Digital terrestrial television. The television technology that carries the Freeview service.

**Dual-carrier LTE 4G** A 4G LTE mobile service which uses double the bandwidth of standard LTE services, resulting in a higher data rate.

**DVB** Digital video broadcasting. A set of internationally-accepted open standards for digital broadcasting, including standards for distribution by satellite, cable, radio and hand-held devices (the latter known as DVB-H). The DVB Project develops the standards.

**DVB-T2.** The latest digital terrestrial transmission technology developed by DVB. The technology is being used to facilitate the introduction of HDTV on DTT in the UK. DVB-S2 (satellite) and DVB-C2 (cable) are also available.

**DVD** Digital versatile disc. A high-capacity CD-size disc for carrying audio-visual content. Initially available as read-only, but recordable formats are now available.

**DVR** Digital video recorder (also known as 'personal video recorder' and 'digital television recorder'). A digital TV set-top box including a hard disk drive which allows the user to record, pause and rewind live TV.

**End-to-end** Operators other than Royal Mail that provide a full postal service from collection to delivery

**EPG** Electronic programme guide. A programme schedule, typically broadcast alongside digital television or radio services, to provide information on the content and scheduling of current and future programmes.

**E-reader** An electronic, portable device capable of downloading and displaying text such as digital books or newspapers.

**E-retail** Distance shopping, using online services to order and pay for goods

**EST** Electronic sell-through. For the purposes of this report electronic sell-through is audio visual content that is purchased and a copy permanently kept, ie not rented.

**Feature phone** A low-end mobile phone that has less computing ability than a smartphone, but more capability than the most basic handsets.

**Fibre-to-the-last-amplifier (FTTLA)** A form of fibre-optic communication delivery in which the last stage of the access network is delivered by Hybrid fibre-coaxial (HFC) cable that is run directly onto the customer's premises.

**Fibre-to-the-building (FTTB)** A form of fibre-optic communication delivery in which an optical fibre is run directly onto the customer's premises.

**Fibre-to-the-cabinet (FTTC)** Access network consisting of optical fibre extending from the access node to the street cabinet. The street cabinet is usually located only a few hundred metres from the subscriber premises. The remaining segment of the access network from the cabinet to the customer is usually a copper pair but could use another technology, such as wireless.

**Fibre-to-the-home (FTTH)** A form of fibre optic communication delivery in which the optical signal reaches the end-user's living or office space.

**Fibre-to-the-premises (FTTP)** A form of fibre-optic communication delivery in which an optical fibre is run directly onto the customer's premises.

**First-run acquisitions** A ready-made programme bought by a broadcaster from another rights holder and broadcast for the first time in the UK during the reference year.

**First-run originations** Programmes commissioned by or for a licensed public service channel with a view to their first showing on television in the United Kingdom in the reference year.

**FM** Frequency modulation. Type of modulation produced by varying the frequency of a radio carrier in response to the signal to be transmitted. This is the type of modulation used by broadcasters in part of the VHF (Very High Frequency) band, known as VHF Band 2.

**Format** The type of programme service broadcast by radio stations. Also, the part of a radio station's licence which describes the programme service.

**Frame relay** A wide area network technology which is used to provide a continuous, dedicated connection between sites without the need for a leased line.

**Free-to-air** Broadcast content that people can watch or listen to without having to pay a subscription.

**Fulfilment mail** Requested goods including tickets, brochures, packets and parcels

**GDP** Gross Domestic Product.

**GPRS** General packet radio service, a packet data service provided over 2.5G mobile networks.

**GPS** The GPS (global positioning system) is a 'constellation' of 24 well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location.

**GSM** Global standard for mobile telephony, the standard used for 2G mobile systems.

**HDTV** High-definition television. A technology that provides viewers with better quality, high-resolution pictures.

**Headline connection speed** The theoretical maximum data speed that can be achieved by a given broadband. A number of factors, such as the quality and length of the physical line from the exchange to the customer, mean that a given customer may not experience this headline speed in practice.

**HSPA** Jointly, downlink and uplink mobile broadband technologies are referred to as HSPA (high speed packet access) services.

**Hyper-local website** An online news or content services pertaining to a town, village, single postcode or other small geographically-defined community.

**IDTV** Integrated digital television set. A television set that includes a digital tuner (as well as analogue) and therefore does not require an additional set-top box to receive digital television. IDTVs are most commonly capable of receiving DTT but also digital satellite (Freesat).

**Incumbent operator/s** An incumbent operator usually refers to a market's established provider/s, in the UK fixed market this is BT and Kingston Communications.

**International roaming** A service offered by mobile operators that allows customers to use their phone abroad. The home operator has agreements with foreign operators that allow customers to make and receive calls, send and pick up text messages, and use some of the other mobile services (such as access to voicemail or topping-up credit on pre-pay phones). The exact services available and the charges for their use vary between operators.

**Internet** A global network of networks, using a common set of standards (e.g. internet protocol), accessed by users with a computer via a service provider.

**Internet-enabled mobile phone** A mobile phone which allows its user to access the internet via in-built access technology such as GPRS or WCDMA.

**Internet-enabled TV** An umbrella term covering any television set connected to the internet via a third-party device, such as a set-top box, a games console, a laptop/PC or other internet-enabled device.

**Internet property** A full domain (i.e. felmont.com), pages (i.e. sports.felmont.com/tennis), applications or online services under common ownership or majority ownership for a single legal entity.

**IP (internet protocol)** The packet data protocol used for routing and carrying messages across the internet and similar networks.

**IPTV** Internet protocol television. The term used for the television platform that delivers channels to viewers using internet protocol (IP) technology over a broadband connection. For the purposes of this report, hybrid systems such as BT TV in the UK (i.e. those that provide television services through both an aerial and an IP connection) are considered IPTV platforms.

**ISDN** Integrated services digital networks. A standard developed to cover a range of voice, data, and image services intended to provide end-to-end, simultaneous handling of voice and data on a single link and network.

**ISP** Internet service provider. A company that provides access to the internet.

**ITC** Independent Television Commission, one of the regulators replaced by Ofcom in 2003

**ITV** All references to ITV should be read as including STV, UTV and Channel Television.

**ITV licensees** ITV Broadcasting Limited, STV, UTV and Channel Television.

**LAN (Local area network)** A network for communication between computers covering a local area, like a home or an office.

**Large letter** This refers to Royal Mail's definition Large Letter. A Large Letter is any item larger than a Letter and up to 353mm in length, 250mm in width and 25mm in thickness, with a maximum weight of 750g.

**L-Band** A range of frequencies within which an allocation has been made in much of the world for broadcasting (1452 to 1492 MHz), generally by satellite, but in Europe for terrestrial digital sound broadcasting in the range 1452 to 1480 MHz. Some DAB digital radio receivers can tune to this range.

**Leased line** A transmission facility which is leased by an end-user from a public carrier, and which is dedicated to that user's traffic.

**LLU (local loop unbundling)** LLU is the process where the incumbent operators (in the UK it is BT and Kingston Communications) make their local network (the lines that run from customers premises to the telephone exchange) available to other communications providers. The process requires the competitor to deploy its own equipment in the incumbent's local exchange and to establish a backhaul connection between this equipment and its core network.

**Local loop** The access network connection between the customer's premises and the local PSTN exchange, usually a loop comprised of two copper wires.

**L-RSL** See also S-RSLs – Long Term Restricted Service Licences. L-RSLs are a means of providing a radio service for a non-resident population within a defined establishment such as hospital patients and staff, students on a campus, or army personnel. They are available

on demand, provided they meet the licensing criteria and that a suitable frequency is available. Licences are renewable after the initial five-year term.

**LTE** (Long-term evolution). Part of the development of 4G mobile systems that started with 2G and 3G networks (also see dual-carrier LTE 4G).

**Machine to machine (M2M)** – wired and wireless technologies that allow systems to communicate with each other.

**Mail centre** A facility serving a geographical area used for the sortation of postal packets

**Micro-blogging** short form blogging, where posts are typically small elements of content such as short sentences, individual images or video links.

**MMS** Multimedia messaging service. The next generation of mobile messaging services, adding photos, pictures and audio to text messages.

**MNO** Mobile network operator, a provider which owns a cellular mobile network.

**Mobile broadband** Various types of wireless high-speed internet access through a portable modem, telephone or other device.

**Modem sync speed** The data rate at which a broadband network negotiates with a modem and the maximum data rate that a particular broadband service can support.

**MP3** (MPEG-1 Audio Layer-3) A standard technology and format for compressing a sound sequence into a very small file (about one-twelfth the size of the original file) while preserving the original level of sound quality when it is played.

**MP3 player** A device that is able to store and play back MP3 files.

**MPEG** Moving Picture Experts Group. A set of international standards for compression and transmission of digital audio-visual content. Most digital television services in the UK use MPEG2, but MPEG4 offers greater efficiency and is likely to be used for new services including TV over DSL and high-definition TV.

**Multichannel** In the UK, this refers to the provision or receipt of television services other than the main five channels (BBC One and Two, ITV, Channel 4/S4C and Channel 5) before digital switchover took place in 2012. 'Multichannel homes' comprised all those with digital terrestrial TV, satellite TV, cable TV or TV over broadband, excluding analogue terrestrial only homes

**Multiplex** A device that sends multiple signals or streams of information on a carrier at the same time in the form of a single, complex signal. The separate signals are then recovered at the receiving end.

**MVNO** An organisation which provides mobile telephony services to its customers, but does not have allocation of spectrum or its own wireless network.

**MW** See MF and AM above.

**Narrowband** A service or connection providing data speeds up to 128kbit/s, such as via an analogue telephone line, or via ISD.

**Near video on demand (NVoD)**, a service based on a linear schedule that is regularly repeated on multiple channels, usually at 15-minute intervals, so that viewers are never more than 15 minutes away from the start of the next transmission.

**Net neutrality** The principle that all traffic on the internet should be treated equally, regardless of content, site or platform.

**Next-generation access networks (NGA)** New or upgraded access networks that will allow substantial improvements in broadband speeds. This can be based on a number of technologies including cable, fixed wireless and mobile. Most often used to refer to networks using fibre optic technology.

**Next-generation core networks (NGN)** Internet protocol-based core networks which can support a variety of existing and new services, typically replacing multiple, single service legacy networks

**Non-linear** Content that is delivered 'on demand' as opposed to live TV

**Ofcom** Office of Telecommunications, whose functions transferred to Ofcom on 29 December 2003.

**'Over-the-top' video** Refers to audio-visual content delivered on the 'open' internet rather than over a managed IPTV architecture.

**Pact** Producers Alliance for Cinema and Television, the UK trade association for independent film, television, animation and interactive media companies.

**Pay-per-view** A service offering single viewings of a specific film, programme or event, provided to consumers for a one-off fee.

**PDA** Personal Digital Assistant.

**Peak time** The period during which: a radio station broadcasts its breakfast show and, on weekdays only, also its afternoon drive-time show; a television station broadcasts its early- and mid-evening schedule, typically used by Ofcom to refer to the period between 18:00 and 22:30 each day (including weekends).

**Peer-to-peer (P2P) distribution** The process of directly transferring information, services or products between users or devices that operate on the same hierarchical level.

**Pipeline** Stages involved in the production and distribution process of a good or service from the initiation of the process to the delivery of the final product. In postal services the pipeline refers to the stages from collection to delivery of a postal item.

**Podcasting** A way for digital audio files to be published on the internet, and then downloaded onto computers and transferred to portable digital audio players.

**Postal packets** A letter, parcel, packet or other article transmissible by post

**PSB** Public service broadcasting, or public service broadcaster. The Communications Act in the UK defines the PSBs as including all BBC channels, ITV (including GMTV, STV and UTV), Channel 4, Channel 5 main channels and S4C.

**PSTN** Public switched telephone network. The network that manages circuit-switched fixed-line telephone systems.

**Publications** Regularly produced publications such as periodicals and magazines

**'Pull' VOD** A video-on-demand system where content is delivered in real time to the viewers. The approach is usually favoured on platforms that have a high-speed return path, such as cable or IPTV

**‘Push’ VOD** A video-on-demand system where content is downloaded to the hard disk of a set-top box rather than streamed in real time via a wired network. The approach is usually favoured on platforms that do not have a high-speed return path, such as satellite or terrestrial.

**PVR** See DVR

**RAJAR Radio Joint Audience Research** – the pan-industry body which measures radio listening.

**Registered items** A service of conveying postal packets from one place to another by post which provides for the registration of the packets in connection with their conveyance by post and for the payment of an amount determined by the person providing the service in the event of the theft or loss or damage to the packets

**Repeats** All programmes not meeting the definition of first-run origination or first-run acquisition.

**Royal Mail Wholesale** A business unit within Royal Mail Group that negotiates with any postal operator or user who applies for access to Royal Mail Group’s postal network.

**RSL** Restricted service licence. A radio licence serving a single site (e.g. a hospital or university campus) or serving a wider area on a temporary basis (e.g. for festivals and events).

**Service bundling (or multi-play)** A marketing term describing the packaging together of different communications services by organisations that traditionally only offered one or two of those services.

**Service provider** A provider of electronic communications services to third parties, whether over its own network or otherwise.

**Share (radio)** Proportion of total listener hours, expressed as a percentage, attributable to one station within that station’s total survey area.

**Share (TV)** The percentage of the total TV viewing audience watching over a given period of time. This can apply to channels, programmes, time periods etc

**SIM (subscriber identity module)** A SIM or SIM card is a small flat electronic chip that identifies a mobile customer and the mobile operator. A mobile phone must have a SIM card inserted before it can be used.

**SIM-only** A mobile contract that is sold without a handset.

**Simulcasting** The broadcasting of a television or radio programme service on more than one transmission technology (e.g. FM and MW, DAB and FM, analogue and digital terrestrial television, digital terrestrial and satellite).

### **Smart glasses**

1. A wearable computer that displays information in the wearer’s field of vision and may support speech interaction. Much of the information is retrieved via a mobile network internet connection, although this link may require use of a mobile phone connected wirelessly to the glasses. Typical applications include mapping and directions, phone call initiation and answering, and taking photographs and videos.
2. A secondary category of smart glasses, designed for use by people with visual impairments, using sensors to provide higher-contrast display of objects in front of the wearer.

**Smartphone** A mobile phone that offers more advanced computing ability and connectivity than a contemporary basic 'feature phone'.

**Smart TV** A standalone television set with inbuilt internet functionality, allowing users to either connect a broadband router directly into the TV or to connect wirelessly.

**Smartwatch** A wearable computer that provides features in addition to those to be expected of a watch. Typically they are connected wirelessly to a mobile phone and display incoming messages, call status and provide some degree of control over the phone, including call answering and control of audio playback. Other features can include motion sensors, cameras and GPS.

**SME** Small to medium-sized enterprise. A company with fewer than 250 employees.

**SMS** Short Messaging Service, usually used to refer to mobile text messaging (see text message below).

**Social networking site (SNS)** A website that allows users to join communities and interact with friends or to others that share common interests.

**Socio-economic group (SEG)** A social classification, classifying the population into social grades, usually on the basis of the Market Research Society occupational groupings (MRS, 1991). The groups are defined as follows.

**A.** Professionals such as doctors, solicitors or dentists, chartered people like architects; fully qualified people with a large degree of responsibility such as senior civil servants, senior business executives and high ranking grades within the armed forces. Retired people, previously grade A, and their widows.

**B.** People with very senior jobs such as university lecturers, heads of local government departments, middle management in business organisations, bank managers, police inspectors, and upper grades in the armed forces.

**C1.** All others doing non-manual jobs, including nurses, technicians, pharmacists, salesmen, publicans, clerical workers, police sergeants and middle ranks of the armed forces.

**C2.** Skilled manual workers, foremen, manual workers with special qualifications such as lorry drivers, security officers and lower grades of the armed forces.

**D.** Semi-skilled and unskilled manual workers, including labourers and those serving apprenticeships. Machine minders, farm labourers, lab assistants and postmen.

**E.** Those on the lowest levels of subsistence including all those dependent upon the state long-term. Casual workers and those without a regular income.

**S-RSLs** Short-term restricted service licences (S-RSLs) are issued for temporary local radio stations which usually serve a very localised coverage area, such as an education campus, a sports event, or a music or religious festival site. These licences are also used for temporary trials of community stations, sometimes to gauge interest before applying for a five-year community licence.

**Streaming content** Audio or video files sent in compressed form over the internet and consumed by the user as they arrive. Streaming is different to downloading, where content is saved on the user's hard disk before the user accesses it.

**Superfast broadband** Sometimes known as next-generation broadband, super-fast broadband delivers actual modem sync speeds of 30Mbit/s or higher

**Superfast product** Fixed-line broadband with headline speeds of more than or equal to 30Mbit/s

**Tablet computer** A mobile computer which is included within a single panel with a touchscreen.

**Telecommunications, or 'telecoms'** Conveyance over distance of speech, music and other sounds, visual images or signals by electric, magnetic or electro-magnetic means.

**Text message** A short text-only communication sent between mobile devices.

**Time-shifting** In the UK, the recording of programmes by viewers (using DVRs, recordable DVDs or VCRs) to watch at another time, or using catch-up 'player' services through the TV set. It can sometimes refer to the broadcast of a television programme on more than one channel with a specified delay (typically an hour to provide more than one opportunity for viewers to watch the service). These are most commonly known as '+1' channel services. In reported UK viewing data from BARB, time-shifted viewing applies to the former.

**Transactional mail** Business mail usually sent on a regular scheduled basis, often used in financial transactions, including statements, invoices and credit card bills

**Transmitter** A device which amplifies an electrical signal at a frequency to be converted, by means of an aerial, into an electromagnetic wave (or radio wave). The term is commonly used to include other, attached devices, which impose a more simple signal onto the frequency, which is then sent as a radio wave. The term is sometimes also used to include the cable and aerial system referred to above, and indeed the whole electrical, electronic and physical system at the site of the transmitter.

**TSA** Total survey area. The coverage area within which a radio station's audience is measured by RAJAR.

**TV over DSL/TV over broadband** A technology that allows viewers to access TV content – either in a linear programme schedule, or on demand – using internet protocol via broadband services, either on a PC or (via a set-top box) on a TV set.

**TVWF** Television Without Frontiers. A range of provisions designed to achieve coordination of the legal, regulatory and administrative frameworks of European Union member states with respect to television broadcasting, adopted by the European Council in 1989 and amended in 1997. TVWF was replaced by the Audio Visual Media Services (AVMS) Directive in December 2007.

**UKOM** UK Online Measurement. A media industry measurement of UK consumers' online activity, specified by UKOM Ltd and delivered by comScore.

**UKPIL** UK Parcels, International and Letters is a division of Royal Mail Group which comprises parcels, international and media & unaddressed mail services

**UMA** Unlicensed Mobile Access, a technology that provides roaming between GSM and 802.11 WiFi

**UMTS** Universal mobile telecommunications system. The 3G mobile technologies most commonly used in the UK and Europe.

**Unaddressed mail** Also known as door-to-door and door drops, unaddressed mail is advertising mail with no specified recipient, usually distributed to all households within a targeted geographical area

**Unbundled** A local exchange that has been subject to local loop unbundling (LLU).

**Unique audience** The number of different people visiting a website or using an application.

**Usage caps** Monthly limits on the amount of data which broadband users can download, imposed by some ISPs.

**UWB Ultra-wideband** A technology developed to transfer large amounts of data wirelessly over short distances, typically less than ten metres.

**VCR** Video cassette recorder.

**VDSL Very High Speed DSL** A high speed variant of DSL technology, which provides a high headline speed through reducing the length of the access line copper by connecting to fibre at the cabinet.

**VHF Very high frequency** The part of the spectrum between 30MHz and 300MHz. FM radio is broadcast on part of this band (87.6MHz to 107.9MHz) and DAB digital radio is broadcast on another (Band III: 217.5MHz to 230MHz in the UK, and over a wider range, but shared with TV services, elsewhere in Europe).

**VOD Video-on-demand** A service or technology that enables TV viewers to watch programmes or films whenever they choose to, not restricted by a linear schedule (also see 'push' VOD and 'pull' VOD).

**VoIP** Voice over internet protocol. A technology that allows users to send calls using internet protocol, using either the public internet or private IP networks.

**WAP** Wireless application protocol.

**Web 2.0** A perceived 'second generation' of web-based communities and hosted services such as social networking sites and wikis, which facilitate collaboration and sharing between users.

**Widget** Widgets are small chunks of code embedded on desktops, web pages, mobile phones and TVs to enable content to be distributed.

**WiFi hotspot** A public location which provides access to the internet using WiFi technology.

**WiMAX** A wireless MAN (metropolitan area network) technology, based on the 802.16 standard. Available for both fixed and mobile data applications.

**Wireless LAN or WiFi (Wireless fidelity)** Short-range wireless technologies using any type of 802.11 standard such as 802.11b or 802.11a. These technologies allow an over-the-air connection between a wireless client and a base station, or between two wireless clients.

**WLR (Wholesale line rental)** A regulatory instrument requiring the operator of local access lines to make this service available to competing providers at a wholesale price.

**XHTML (Extensible HTML)** A mark-up language for web pages from the W3C. XHTML combines HTML and XML into a single format (HTML 4.0 and XML 1.0).

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