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Communications Regulation

Irish Communications Market

Quarterly Key Data Report

Data as of Q4 2016

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An Coimisiún um Rialáil Cumarsáide

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Corrigendum to Q3 2016 Report

Five operators informed ComReg about incorrect historically provided information:

Note 1: Mobile broadband subscriptions were revised from Q1 2016 to Q3 2016 inclusive following revisions by Vodafone to historically provided information with such revisions ranging from -14,526 to +3,824.

Note 2: Mobile voice subscriptions were revised for Q3 2016 following a revision by ID to historically provided information, with the revision amounting to +673. A further revision to mobile voice subscriptions was applied to Q3 2016 following clarification from Vodafone, with the correction amounting to +12,117.

Note 3: Mobile data volumes traffic were revised from Q1 2015 to Q3 2016 inclusive following revisions by Vodafone to historically provided information, with such revisions ranging from -18% to -21% of aggregate mobile data volumes. In light of Vodafone's inability to provide corrected data for previous quarters, ComReg further revised historical data from Q4 2013 to Q4 2015 ranging from -14% to -17% of aggregate volumes.

Note 4: Double play TV and internet subscriptions were revised for Q3 2016 following a revisions by Vodafone and Magnet with these revisions amounting to +4,032 and +190 respectively. This does not affect reported internet subscriptions.

Note 5: Direct narrowband access paths were revised for Q3 2016 following a revision by Magnet, with this revision totalling -12,152.

Note 6: Retail fixed voice revenues were revised for Q3 2016 following a revision by Vodafone, with this revision totalling +€328K.

Note 7: Retail broadband revenues were revised for Q3 2016 following a revision by Magnet with this revision totalling +€455K.

Note 8: Wholesale revenues were revised from Q1 2016 to Q3 2016 inclusive following revisions by BT Ireland to historically provided information with such revisions ranging from +€452K to +€544K.

Note 9: Fixed voice call categories have been revised from Q2 2014 to Q3 2016 following revisions from Verizon to historically provided information. Such revisions do not affect aggregate totals but do affect proportions of domestic fixed to fixed, international outgoing and Other/Advanced. Managed voice over broadband (VoB) minutes were also affected by these revisions, resulting in historical data being revised from +14% to +55%.

Note 10: Ported fixed numbers for Q3 2016 have been revised due to an operator error in the reporting of ported fixed numbers. The initial quantity has been revised down by 50,206.

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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.

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Summary

Comparing Q3 2016 to Q4 2016 overall industry retail revenues increased by 2.1%. Total retail revenues in the twelve months to December 2016 at €3.074 billion were up from €3.038 billion over the 12 months previous. There were 1,360,309 fixed broadband subscriptions this quarter which was an increase of 1.3% from Q3 2016 and an increase of 3.9% compared to Q4 2015. Overall voice traffic volumes decreased by 0.1% this quarter. Presented below is a tabular summary of the data presented throughout this Quarterly Key Data Report.

Irish Quarterly Communications Market Data Q4 2016				
	Q4 2016	Q3 2016	Quarterly Change	Annual Change
Total Retail Market Revenues ¹	€786,979,056	€770,995,282	2.1%	1.6%
Fixed Line Retail Revenues ²	€352,168,098	€343,164,620	2.6%	6.0%
Mobile Retail Revenues	€401,847,730	€394,265,887	1.9%	-0.4%
Broadcasting Retail Revenues	€32,963,228	€33,564,775	-1.8%	-15.8%
Fixed Line Wholesale Revenues ³	€139,675,999	€144,195,780	-3.1%	-4.5%
Mobile Wholesale Revenues	€49,649,788	€66,702,057	-25.6%	-35.7%
Total Voice Traffic (Minutes)	4,148,560,007	4,151,766,387	-0.1%	-1.7%
Fixed Voice Traffic (Minutes)	1,022,409,364	1,031,864,645	-0.9%	-6.6%
Mobile Voice Traffic (Minutes)	3,126,150,643	3,119,901,742	0.2%	0.1%
Fixed Broadband Subscriptions	1,360,309	1,342,727	1.3%	3.9%
Fixed Subscriptions	1,805,923	1,798,609	0.4%	-0.9%
Fixed Voice Subscriptions	1,475,661	1,468,960	0.5%	-0.4%
Total Mobile Subscriptions (inc. Mobile broadband and M2M)	5,969,928	5,937,883	0.5%	2.0%
Machine to Machine Subscriptions	670,389	647,894	3.5%	21.0%
Mobile Broadband Subscriptions ⁴	349,421	361,463	-3.3%	-12.5%
Mobile Subscriptions ⁵ (exc. Mobile broadband and M2M)	4,950,118	4,928,526	0.4%	1.0%

¹ Mobile and Fixed line wholesale revenues are excluded from this figure.

² Retail fixed voice revenues were revised for Q3 2016. See note 6 within the corrigendum of this report.

³ Wholesale fixed line revenues were revised for Q3 2016. See note 8 within the corrigendum of this report.

⁴ Mobile broadband subscriptions were revised for Q3 2016. See note 1 within the corrigendum of this report.

⁵ Mobile subscriptions (ex M2M and MBB) were revised for Q3 2016. See note 2 within the corrigendum of this report.

- Overall electronic communications network and service retail revenues at the end of December 2016 were over €786 million for the quarter. Industry retail revenues rose by 2.1% this quarter and increased by 1.6% compared to Q4 2015.
- At the end of December 2016 there were 1,475,661 fixed voice subscriptions in Ireland, an increase of 0.5% since last quarter but a decrease of 0.4% since Q4 2015.
- Total voice traffic minutes decreased by 0.1% this quarter and were 1.7% lower than in Q4 2015. Mobile minutes form the majority of voice minutes at 75.4%, with fixed minutes representing the remaining 24.6%. Mobile voice minutes increased by 0.2% while fixed voice minutes decreased by 0.9% this quarter.
- Fixed broadband subscriptions increased by 1.3% this quarter and were up by 3.9% compared to Q4 2015. VDSL⁶ (up by 7.8%), FWA (up by 9.3%), cable (up by 0.1%) and FTTP⁷ subscriptions (up by 20.2%) increased this quarter while DSL⁸ (down by 5.2%), satellite (down by 0.5%) and mobile broadband (down by 3.3%) all fell this quarter.
- The estimated fixed broadband household penetration rate⁹ was 69.6% in Q4 2016. The fixed broadband per capita penetration rate was 28.9%. The broadband per capita penetration rate (including mobile broadband) was 36.4%.
- Average fixed broadband speeds continue to increase. In Q4 2016 approximately 78.0% of all fixed broadband subscriptions were equal to or greater than 10Mbps up from 72.7% in Q4 2015¹⁰. 64.9% of all fixed broadband subscriptions were equal to or greater than 30Mbps, up from 56.1% in Q4 2015.
- At the end of December 2016 there were 5,969,928 mobile subscriptions (including mobile broadband and M2M) in Ireland, an increase of 0.5% since the last quarter. The mobile penetration rate was 127.0% including mobile broadband and M2M subscriptions and 105.3% excluding mobile broadband and M2M subscriptions.

⁶ VDSL refers to very-high-bit-rate digital subscriber line. These lines are typically utilised in the provision of next generation broadband services.

⁷ FTTP (fibre to the premises) refers to a range of fibre access installations such as fibre to the home (FTTH), fibre to the premises (FTTP) and fibre to the curb.

⁸ DSL refers to a digital subscriber line, the means by which broadband speeds (i.e. in excess of 144k downstream) are delivered over the copper telecoms network.

⁹ This estimate excludes business subscriptions and mobile broadband subscriptions.

¹⁰ Note: The method employed for calculating broadband speeds changed in Q2 2016 and applied retrospectively.

- The number of voice and data subscribers using 3G/4G networks increased to 4,340,981 this quarter, up by 1.8% from Q3 2016 and up by 6.0% compared to Q4 2015.
- There were 528,409 gross additions in the number of mobile subscriptions. Of these, 94,711 were subscriptions with ported numbers. On average, there were 90,720 numbers ported and 501,121 total gross additions per quarter over the last 12 months.
- In Q4 2016 mobile ARPU was €23.01 per month, down from €24.62 per month in Q4 2015. Declining mobile ARPU is likely to be a reflection of a number of factors such as those attributable to increased sales of bundled products (combining mobile with fixed calls, broadband and TV) and reductions in mobile roaming and termination rates, among others.

Notes to data:

- FWA broadband traffic reported for Q4 2016 is partially based on an estimate from Imagine Telecommunications Business Limited due to issues with reporting accurate data for this metric.
- Cable broadband traffic reported from Q3 2015 to Q4 2016 is based on an estimates from Virgin Media Ireland Limited due to issues with reporting accurate data for this metric.
- As of Q4 2016 FTTP and satellite subscriptions have been broken out from the previously reported 'Other' category. Additional subscriptions for FTTP (fibre to the premises, including fibre to the home (FTTH) and fibre to the curb) are included from Q3 2016.
- As of Q2 2016 two new mobile operators have been included, iD and Virgin Media.
- As of Q3 2015 additional leased line revenue information is available from three operators. One operator has provided additional information on Wi-Fi services. Hence, information since that quarter is not strictly comparable with data published in previous periods.
- As of Q2 2015 mobile to mobile voice traffic between O2 and Three is treated as on-net traffic.

- As of Q4 2014 a more precise breakdown of business versus residential fixed subscriptions (fixed voice and fixed broadband subscriptions) is available following an operator upgrade of its reporting systems.
- Following the completion of the Three's acquisition of O2, Three, O2 and 48 brands are reported under the umbrella of the Three Group as of Q2 2014.
- Both Meteor and Eir mobile brands are reported under the umbrella of Eir Group Mobile.
- Sky Ireland does not provide public information on TV subscriptions and TV revenues. Thus, information based on actual data from Sky is not included in the report. Sky Ireland's distribution of subscriptions by type (single play, double play or triple play) is instead estimated using the percentage distribution of Sky Ireland's subscriptions as obtained from market survey data conducted by Behaviour & Attitudes Ltd on behalf of ComReg. For more details on survey method, see the Appendix on page 81.
- Irish population estimates¹¹ of 4,700,100 is used for Q4 2016 and 4,692,300 for Q3 2016 where appropriate. Similarly an estimated household number of 1,720,600 is used for Q4 2016 and 1,727,700 for Q3 2016 where appropriate. These statistics are obtained from the Central Statistics Office (CSO) QNHS survey.
- A number of external sources are used for international comparisons. These include the CSO, Analysys Mason, and Strategy Analytics (Teligen).
- In most cases data has been rounded to one decimal place in this report.
- Not all charts in this report may sum exactly to 100% due to rounding.
- While quarter on quarter comparisons are made in the report, definitive conclusions with regard to trends cannot be drawn from this and year on year comparisons are used to improve the reliability of the analysis.
- Further explanations and descriptions of data supplied in this report can be found in the accompanying explanatory memorandum 17/15a.
- Extracts of data used in this report can be downloaded at <http://www.comreg.ie/industry/electronic-communications/data-portal>
- Data previously published may have been amended since publication. Any such amendments are noted in the corrigendum notice on page 5 of this report.

¹¹ Estimates based on the CSO's Quarterly National Household Survey (QNHS).

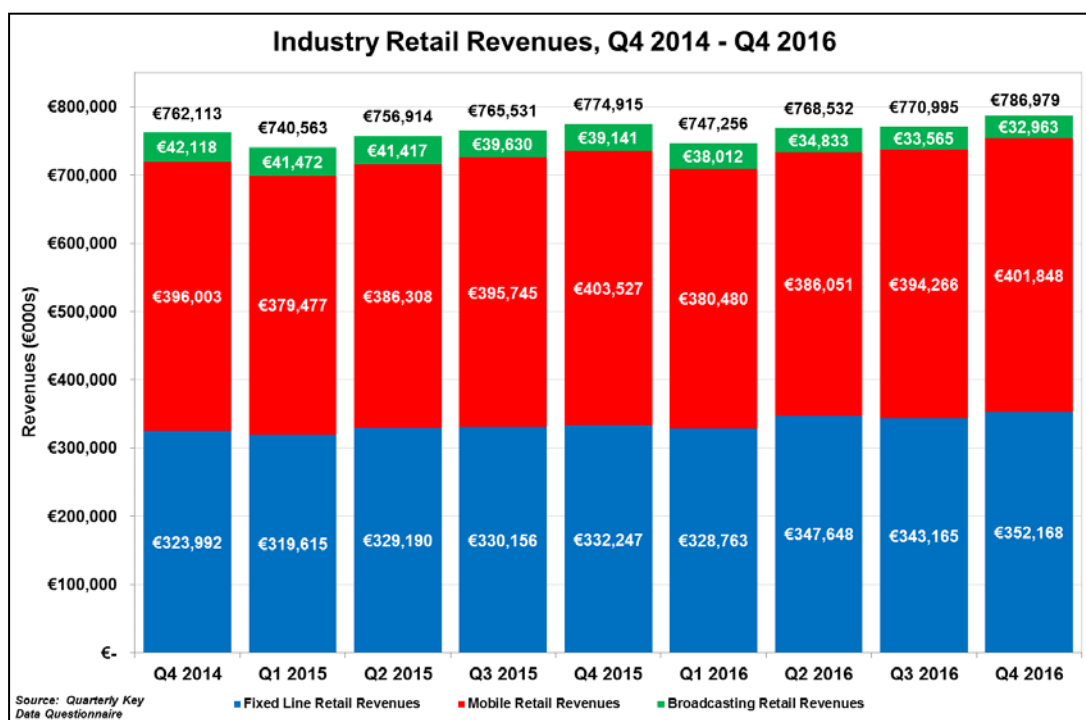
1. Overall Market Data

Data presented in this Quarterly Key Data Report is based on questionnaires completed by certain authorised operators¹² for the period from 1 October to 31 December 2016. The report is based on submissions from 41 active operators¹³.

1.1 Overall Electronic Communications Revenues¹⁴

Figure 1.1.1 shows the developments in revenues attributable to the provision of fixed line, mobile and certain TV broadcasting services. Total industry retail revenues increased by 2.1% this quarter and increased by 1.6% compared to Q4 2015. The quarterly increase in retail revenues was driven by increases in fixed line retail revenues. Mobile revenues accounted for 51.1% of total industry retail revenues followed by fixed line (44.7%) and broadcasting (4.2%) revenues. Over the twelve months to September 2016, total retail revenues were over €3.073 billion.

Figure 1.1.1 – Fixed, Mobile & Broadcasting Retail Revenues



According to the CSO, Ireland's Gross National Product for Q3 2016¹⁵ was approximately €53.5 billion. Based on the Q3 2016 retail revenue data reported to ComReg by

¹² Operators who generate in excess of €500,000 in retail and/or wholesale revenues from electronic communications networks and services per annum.

¹³ See table A2 in the Appendix on page 84 for the list of respondents who submitted data to ComReg.

¹⁴ Further detail on terms and definitions - ComReg Doc. 17/15a Explanatory Memorandum.

¹⁵ Q3 2016 is the latest period for which GNP data is available.

operators in the Irish communications sector, these revenues were approximately 1.4% of GNP in that quarter.

This quarter, mobile retail revenues increased by 1.9% but decreased by 0.4% compared to Q4 2015. Fixed line retail revenues increased by 2.6% this quarter and increased by 6.0% compared to Q4 2015. Broadcasting (Cable/IPTV) retail revenues decreased by 1.8% this quarter and declined by 15.8% compared to Q4 2015. The broadcasting network retail revenues in this report only capture Cable/IPTV revenues and thus, exclude Sky Ireland's satellite TV revenues and all content-related revenues.¹⁶

1.2 Overall Call Volumes

Figure 1.2.1 – Fixed and Mobile Voice Call Volumes (Minutes)¹⁷

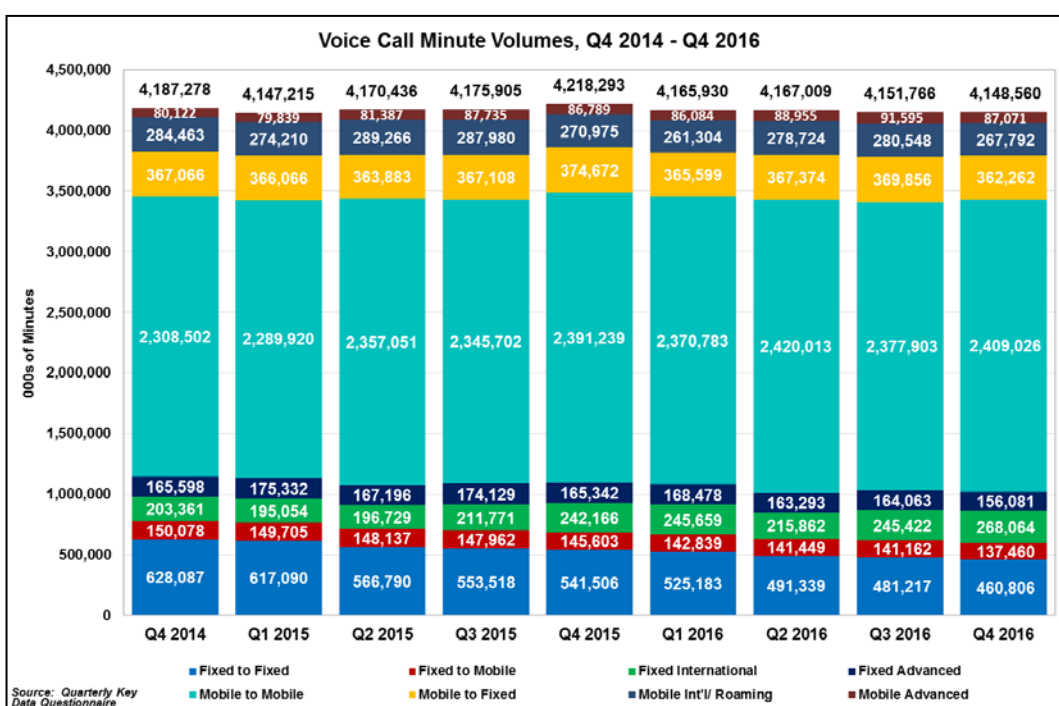


Figure 1.2.1 profiles volumes of originating voice calls by call type on both fixed and mobile networks on a quarterly basis. There was a decrease in total voice minutes this quarter. Voice minutes for Q4 2016 totalled 4.15 billion minutes, there were 16.63 billion minutes in the twelve months to the end of December 2016. Total voice minutes decreased by 0.1% from the previous quarter and decreased by 1.7% since Q4 2015.

¹⁶ ComReg captures Cable/IPTV revenues from a number of TV providers for publication in the Quarterly Key Data Report under broadcasting revenues. The collection and publication of licence fee and/or television advertising revenues does not fall within ComReg's remit and therefore, is not included in the broadcasting revenue figure.

¹⁷ Fixed advanced minutes include premium rate services minutes, freephone minutes, payphone minutes, operator services minutes, national and international virtual private network minutes. Mobile advanced minutes include premium rate services minutes and other mobile minutes such as voicemail, DQ, call completion minutes etc.

It should be noted that managed VoB minutes are included with calls originating from fixed networks in figure 1.2.1, and are split according to the same call categorisations (i.e. domestic, international, mobile, other).

Mobile originating voice minutes (up 0.1% on Q4 2015) accounted for 75.4% of all voice minutes in Q4 2016 (compared to 74.1% in Q4 2015) while traffic originating on fixed line networks (down 6.6% on Q4 2015) accounted for the remaining 24.6% of all voice minutes (compared to 25.9% in Q4 2015). Figure 1.2.2 shows total voice traffic in Ireland at the end of Q4 2016.

Figure 1.2.2 – Total Voice Traffic

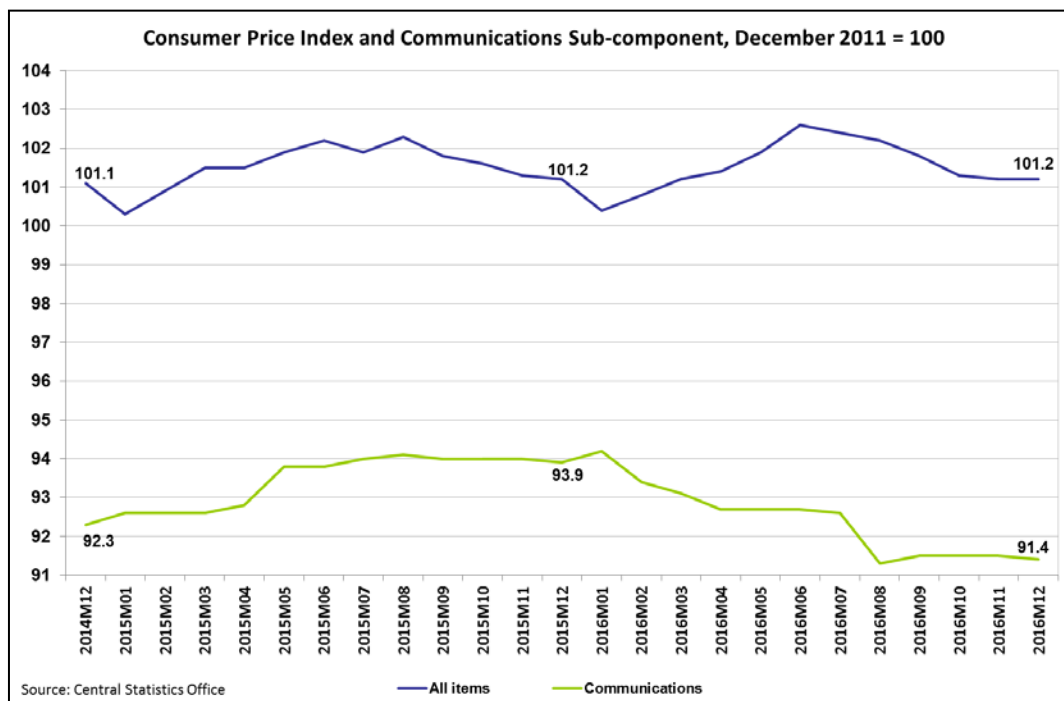
	Q4 2016 Mins	Q3'16 – Q4'16 Growth	Q4'15 – Q4'16 Growth
Fixed Voice Minutes	1,022,409,364	-0.9%	-6.6%
Mobile Voice Minutes	3,126,150,643	+0.2%	+0.1%
Total Voice Minutes	4,148,560,007	-0.1%	-1.7%

1.3 Communications and the Consumer Price Index

Figure 1.3.1 shows the monthly change in the Consumer Price Index (CPI) and the communications sub-component from December 2014 to December 2016. In January 2015, the CSO revised its weighting for the communications basket to 3.030% of the total CPI, up from 2.932% previously.¹⁸

Using December 2011 as the base period, communications prices have generally decreased over the last 12 months with a slight increase from August to September. Communication prices have decreased by 2.5 base points since December 2015 while the overall CPI returned to the December 2015 level of 101.2.

¹⁸ <http://www.cso.ie/en/releasesandpublications/er/cpi/consumerpriceindexjanuary2017/>

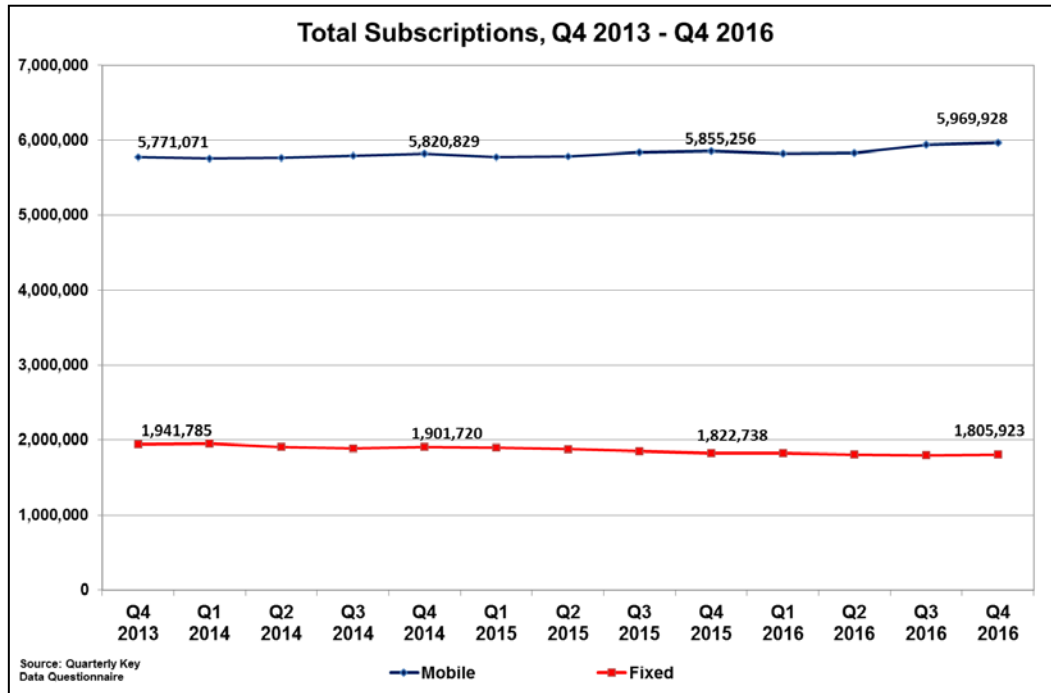
Figure 1.3.1 – Consumer Price Index and Communications Sub-Component

1.4 Fixed and Mobile Market Retail Voice, Internet and TV Subscriptions

Figure 1.4.1 shows the total number of mobile voice and data subscriptions (also reported in section 4.1) and the estimated number of fixed subscriptions to voice, internet and TV services (both single play and bundled subscriptions) in Ireland.

Customers purchasing either a single fixed service or more than one service (as part of a bundle) are included in the fixed subscriptions category. Total mobile subscriptions have increased by 0.5% since Q3 2016, while total fixed subscriptions increased by 0.4% over the same period. It should be noted that it is possible that a customer may have more than one subscription, particularly where a mobile customer has more than one SIM card or in the case of a business customer with multiple fixed line subscriptions across several offices.

Figure 1.4.1 – Total Subscriptions (Fixed and Mobile)



2. Fixed Market Data

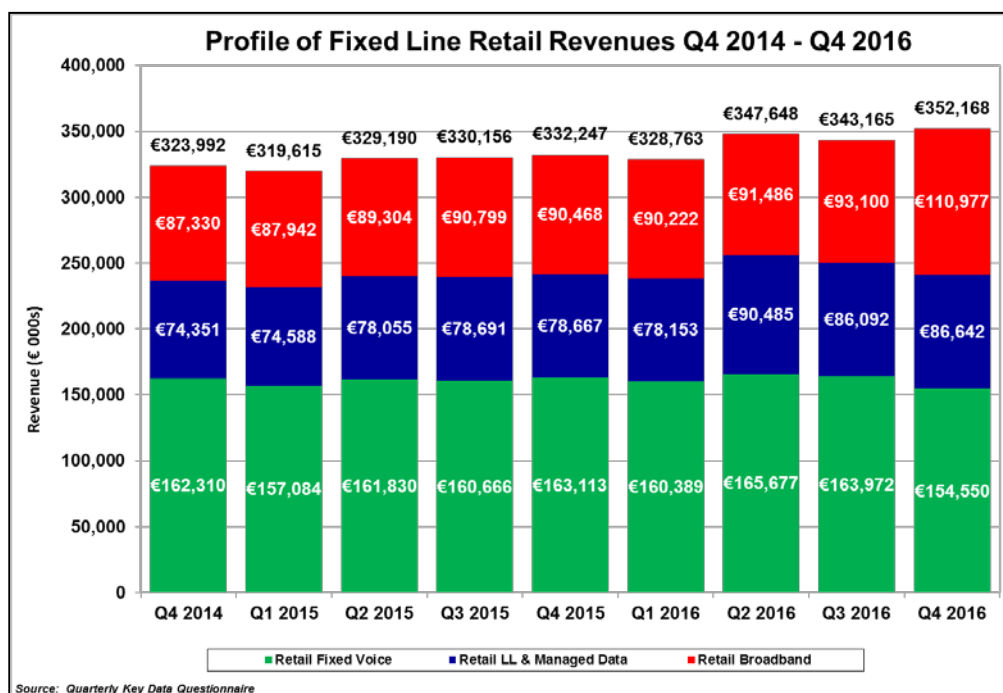
2.1 Fixed Line Revenues¹⁹

Figure 2.1.1 shows the profile of fixed line retail revenues in Ireland over the last two years. Total fixed line retail revenues for Q4 2016 were over €352 million. This was an increase (2.6%) on Q3 2016 revenues but a 6.0% increase on Q4 2015 revenues.

Retail broadband revenues (+22.7%) as well as retail leased lines, managed and other data services revenues (+10.1%) have risen since Q4 2015 while retail fixed voice revenues have fallen (-5.2%).

Comparing Q4 2015 to Q4 2016, the proportion of retail fixed line revenues attributable to retail leased lines, managed data and other advanced data services declined by 0.5 of a percentage point to 24.6% while retail broadband revenue's share increased by 4.4 percentage points to 31.5%. The proportion of retail fixed voice revenues fell by 3.9 percentage points to 43.9% of overall fixed line retail revenues.

Figure 2.1.1 – Profile of Fixed Line Retail Revenues



Fixed line wholesale revenues were over €139 million in Q4 2016, the majority of which were related to interconnect and wholesale fixed narrowband access revenues, followed by wholesale leased lines, managed and other data services revenues and wholesale

¹⁹ As noted on page 8, additional leased line revenue information is available from three operators since Q3 2015. Hence, revenue and market share information in Figures 2.1.1 and 2.1.1.1 and 2.1.1.2 is not directly comparable to information in previous periods.

broadband access revenues. Wholesale revenues decreased by 3.1% compared to Q3 2016²⁰ and were down by 4.5% since Q4 2015.

2.1.1 Authorised Operators' Share of Fixed Line Revenues

Figure 2.1.1.1 below outlines the revenue shares for the fixed retail market (comprising narrowband, broadband, leased line, managed and other data revenues) held by the incumbent fixed line operator (Eir), authorised operators having at least a 2% market share, and all other authorised operators (OAOs) with market share less than 2%.

In Q4 2016, Eir had the highest retail revenue share in the fixed retail market with 43.5% market share. Virgin Media had 14.7%, followed by Vodafone (fixed only) with 14.3%, BT (5.3%), Sky Ireland (4.9%), Magnet²¹ (2.7%) and Verizon (2.1%). OAOs accounted for the remaining 12.5%.

Figure 2.1.1.1 – Fixed Retail Revenue Market Shares

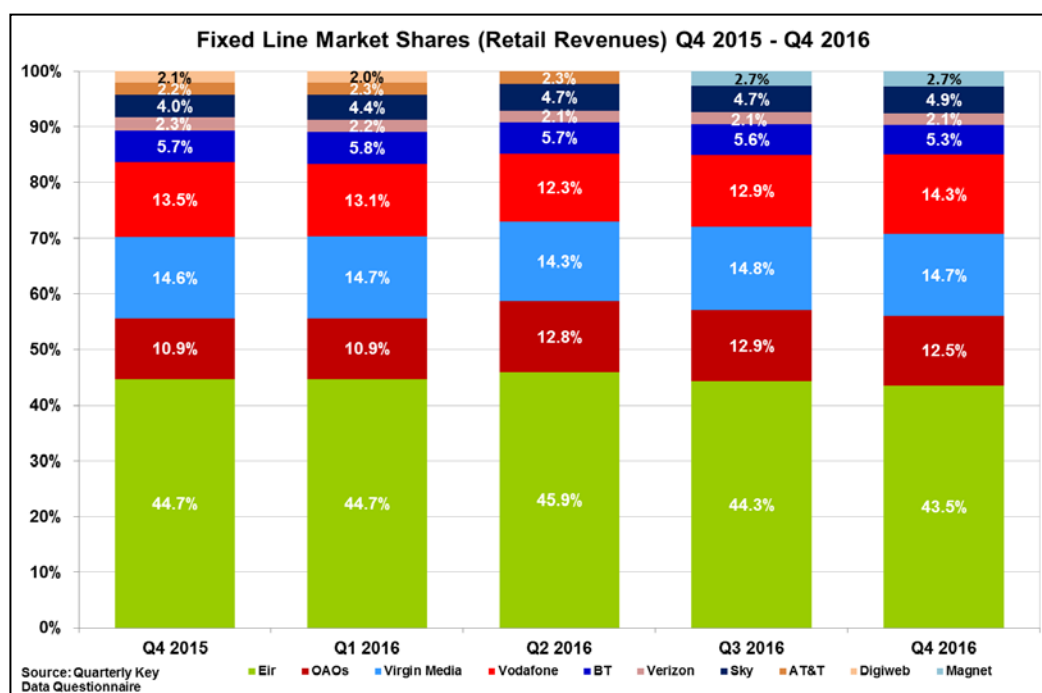


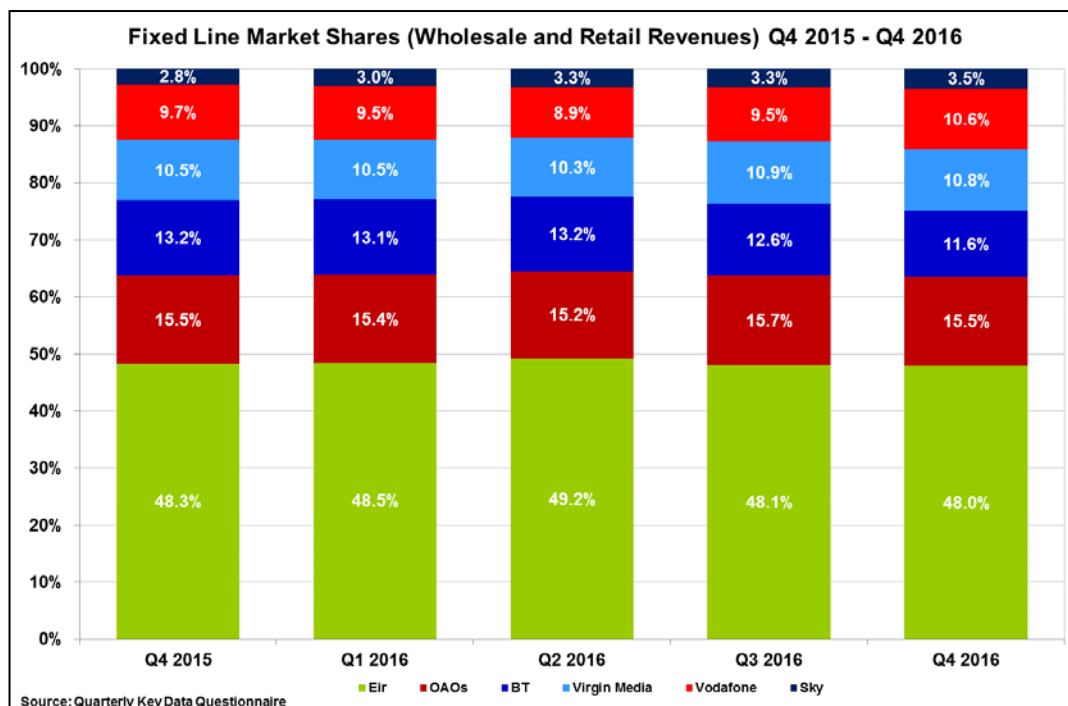
Figure 2.1.1.2 outlines the revenue shares in the fixed market (comprising fixed line retail and wholesale revenues). When making comparisons, it is important to note that the market shares presented below are based on shares across all fixed wholesale and retail revenue streams and some operators may not offer products and services across all segments of these markets.

²⁰ Wholesale revenues were revised for Q3 2016. See note 8 in the corrigendum of this report.

²¹ In Q3 2016 Magnet reached a market share revenue greater than 2%, therefore it is not included in the OAO category. Conversely, in Q3 2016 AT&T had a market share below 2%, therefore are included in the OAO category.

In Q4 2016, Eir had the highest revenue market share with 48.0%. ComReg estimates that the next four largest operators (BT, Vodafone (fixed only), Virgin Media and Sky Ireland) contribute a further 36.5% share of total (retail and wholesale) industry revenue, while OAOs account for the remaining 15.5%.

Figure 2.1.1.2 – Fixed Revenue Market Shares



2.2 Fixed Line Access Paths²² and Subscriptions

2.2.1 Access Paths and VoB Subscriptions

Figure 2.2.1.1 presents the total number of narrowband copper fixed access paths (PSTN and ISDN) and Voice over Broadband (VoB) subscriptions. PSTN and ISDN access paths are usually used for voice services and internet access. There were over 1.45 million direct and indirect PSTN and ISDN access²³ paths in the Irish market in Q4 2016. This represents a decrease of 0.7% on last quarter and a decline of 2.7% since Q4 2015. The number of PSTN access paths has decreased by 0.8% from last quarter and declined by 2.5% since Q4 2015. The number of ISDN access paths decreased by 0.3% since Q3 2016 and decreased by 3.4% since Q4 2015. At the same time, the number of VoB subscriptions increased by 1.3% since Q3 2016 and rose by 0.7% since Q4 2015.

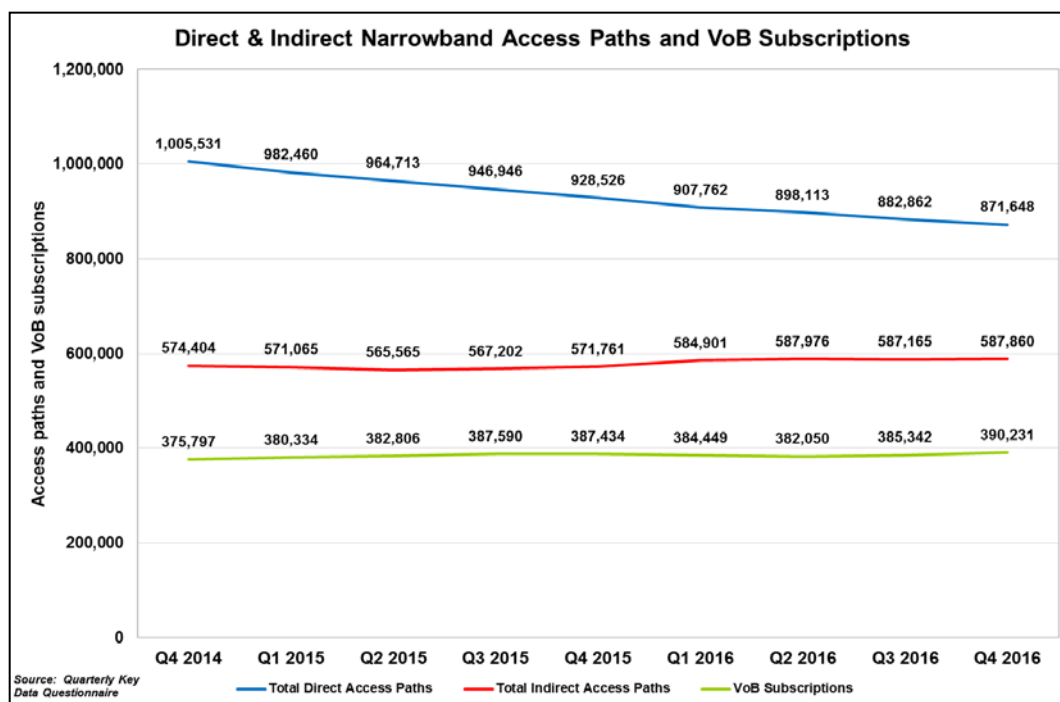
²² Access paths are not synonymous with access lines as for example in the case of ISDN paths, there may be more than one path provided via a single ISDN line.

²³ Indirect access paths relate to telephone lines provided to customers by means of Carrier Pre-select (CPS), Wholesale Line Rental (WLR) or Switchless Voice (SV). CPS allows the user to receive all or a portion of calls from one provider and line rental from another provider (usually eir). SB-WLR (also known as Single Billing-WLR) allows the user to receive every aspect of telephone service, including all calls and line rental from one single supplier. SV also known as White Label Access-Voice Access (WLA-(Voice)) is a switchless voice service which allows an operator to purchase end-to-end call services without the need to have its own interconnection infrastructure.

Figure 2.2.1.1 – Narrowband Fixed Access Paths and VoB Subscriptions

	Q4 2016	Q3'16 – Q4'16 Growth	Q4'15 – Q4'16 Growth
PSTN	1,135,678	-0.8%	-2.5%
ISDN Basic	116,674	-1.3%	-5.3%
ISDN Fractional	50,016	+1.7%	-6.5%
ISDN Primary	157,140	+0.8%	-0.9%
Total ISDN	323,830	-0.3%	-3.4%
Total PSTN and ISDN	1,459,508	-0.7%	-2.7%
VoB Subscriptions	390,231	+1.3%	+0.7%

Figure 2.2.1.2 presents the total number of narrowband fixed access paths broken out by direct and indirect access as well as the number of VoB subscriptions. In Q4 2016, indirect access accounted for 40.3% of all narrowband access paths in the fixed line market²⁴.

Figure 2.2.1.2 – Direct & Indirect Narrowband Fixed Access Paths and VoB Subscriptions

2.2.2 Indirect Access Paths

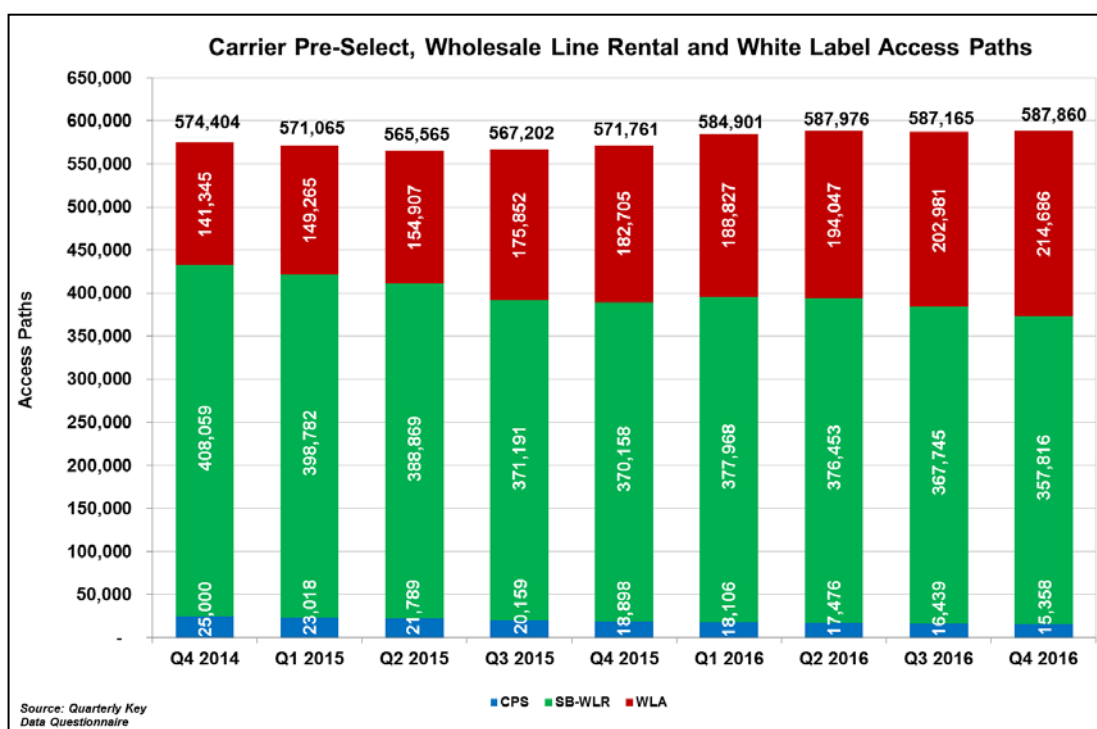
Figure 2.2.2 illustrates the overall number of indirect PSTN and ISDN paths provided by means of either Carrier Pre-Selection (CPS) only, Single Billing Wholesale Line Rental (SB-WLR) and White Label Voice Access (WLA). In Q4 2016, there were 587,860 indirect

²⁴ Direct access paths were revised for Q3 2016. See note 5 in the corrigendum of this report.

access paths in Ireland. The number of indirect access paths increased by 0.1% this quarter and rose by 2.8% in the year to Q4 2016.

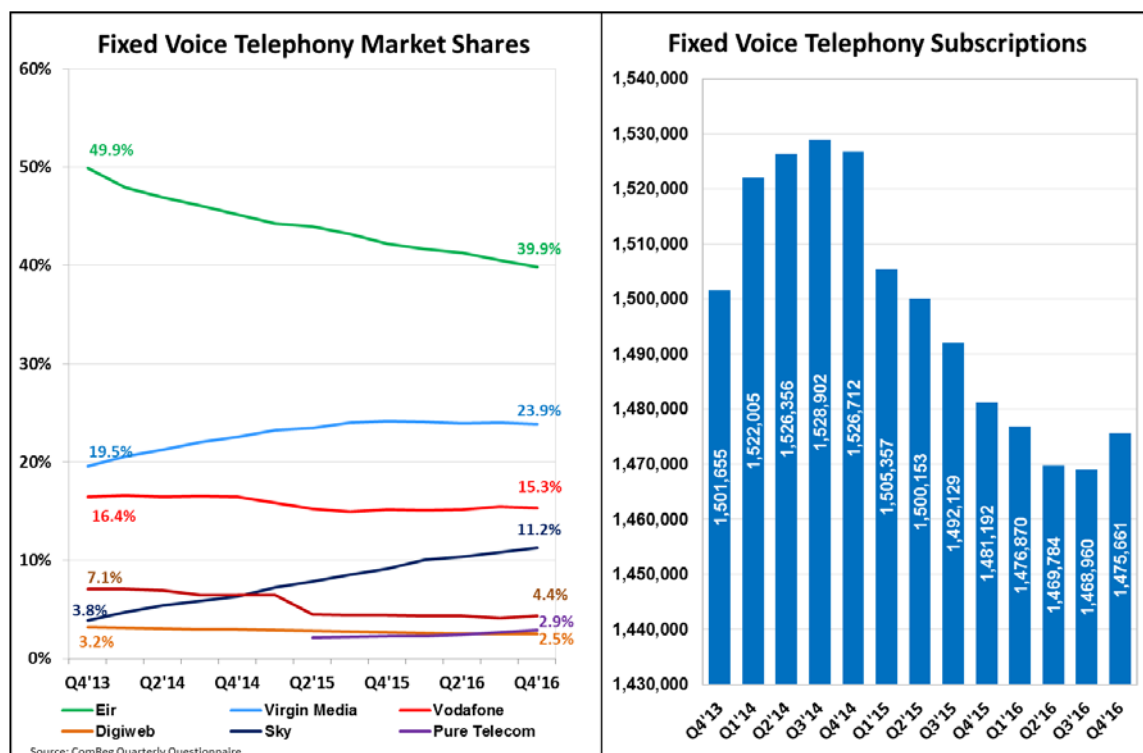
The data indicates that OAOs continue to migrate their customer base to single-bill services, i.e. SB-WLR or WLA rather than CPS only (i.e. a calls only service, excluding line rental). SB-WLR used by OAOs now accounts for 60.9% of indirect access paths compared to 71.0% in Q4 2014. WLA paths account for 36.5% of total indirect access paths compared to 24.6% in Q4 2014. The share of CPS only indirect access paths has declined by 1.7 percentage points in the last two years and now accounts for 2.6% of overall indirect access paths.

Figure 2.2.2 – Narrowband Indirect Access Paths



2.2.3 Fixed Voice Subscriptions

Figure 2.2.3 shows the estimated number of retail customers/subscriptions to fixed voice services (either standalone or as part of a bundle) and operators' market shares based on these subscriptions. At the end of Q4 2016 there were 1,475,661 fixed voice subscriptions (an increase of 0.5% since Q3 2016 but a decrease of 0.4% on Q4 2015). As of Q4 2016 Eir had 39.9% of all fixed voice subscriptions followed by Virgin Media (23.9%), Vodafone (15.3%), Sky (11.2%), Pure Telecom (2.9%) and Digiweb (2.5%). OAOs accounted for the remaining 4.4% of fixed voice subscriptions.

Figure 2.2.3 – Fixed Voice Subscriptions

2.2.4 Fixed Market Retail Subscriptions by Type

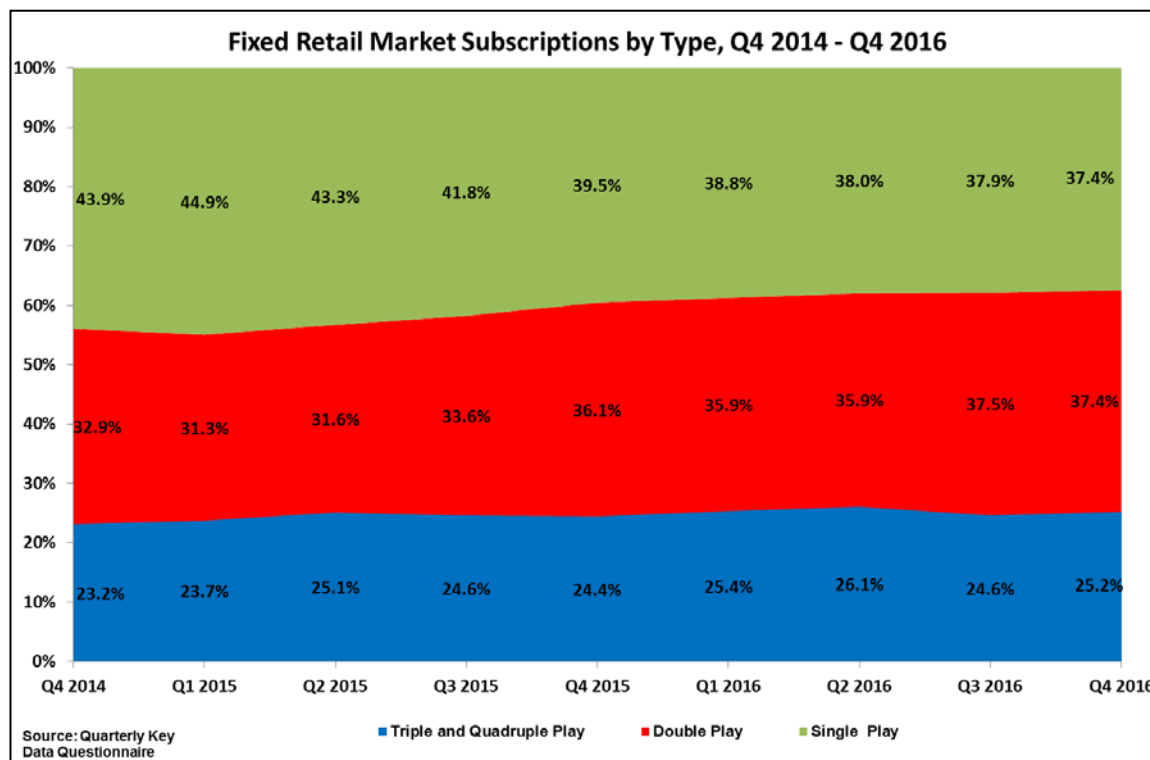
Figure 2.2.4 shows the estimated proportion of retail customers/subscriptions to fixed line services (mobile is excluded from single play subscriptions, but included when part of a bundle e.g. double/triple/quad play) broken out by those with a single service and those taking a bundle of two or more services as of Q4 2016 (subscriptions mean a customer with at least one contract with an electronic communications service provider).²⁵ Single play subscriptions include fixed line services only (including standalone cable TV and IPTV services) which means that standalone mobile voice, standalone mobile broadband and standalone satellite TV subscriptions are excluded from this figure.

It is estimated that there were 1,805,923 fixed market retail subscriptions in Q4 2016 across both business and residential customers (a business customer may have multiple subscriptions). Q4 2016 saw an increase in triple and quadruple play subscriptions when compared to Q3 2016. In Q4 2016 37.4% of fixed market retail subscriptions were single play compared to 39.5% in Q4 2015. Similarly, 37.4% of subscriptions were

²⁵ Double play subscriptions can refer to either fixed telephony and internet or television or mobile telephony; television and the internet; mobile telephony and internet or television subscriptions. Triple play subscriptions can refer to fixed telephony and internet and television; fixed telephony and mobile telephony and internet; fixed telephony and mobile telephony and television; or, mobile telephony and internet and television subscriptions. Quadruple play subscriptions refer to fixed telephony, internet, television and mobile subscriptions.

double play (a bundle of two services)²⁶ compared to 36.1% in Q4 2015 and 25.2% were a combination of triple play (a bundle of three services) and quadruple play (a bundle of four services) compared to 24.4% in Q4 2015.

Figure 2.2.4 – Fixed Market Retail Subscription Type²⁷



2.3 Fixed Voice Call Volumes

Fixed voice traffic in Q4 2016 was just over 1.02 billion minutes, which was a 0.9% decrease on Q3 2016 and a fall of 6.6% since Q4 2015.

Managed voice over broadband (VoB) minutes account for approximately 19.9% of total fixed voice minutes down from 18.0% in Q4 2015²⁸.

The numbers quoted in this QKDR report represent managed VoB services only (for example by Eir, Virgin Media and other providers such as Blueface) and do not include unmanaged or over-the-top VoB services offered by providers such as Skype.

²⁶ Double play subscriptions were revised for Q3 2016. See note 4 in the corrigendum of this report.

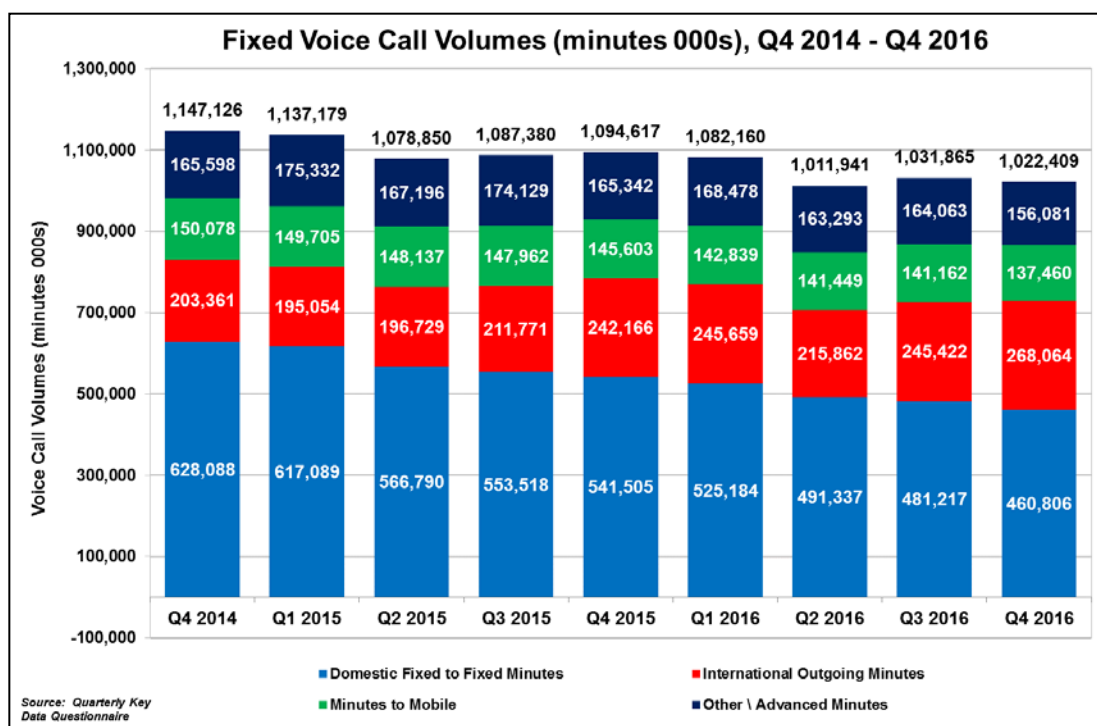
²⁷ Sky Ireland do not provide information on TV subscriptions. Sky Ireland's distribution of subscriptions by type (single play, double play or triple play) is estimated using the percentage distribution of Sky Ireland's subscriptions obtained from the market survey data conducted by RED C Research & Marketing Ltd on behalf of ComReg. For more details on the survey method, see the Appendix on page 81.

²⁸ Volumes of VoB minutes were retrospectively revised upwards in Q4 2016. See note 9 in the corrigendum of this report.

It should be noted that the split of managed VoB minutes by category (i.e. domestic, international, mobile, other) is placed into those respective fixed minutes categories in figures 2.3.1, 2.3.2 and 2.3.3²⁹.

Figure 2.3.1 shows the breakdown of fixed voice call volumes by call type. Domestic fixed to fixed minutes accounted for 45.1% of all fixed voice traffic in Q4 2016. International outgoing minutes accounted for 26.2% of all fixed voice traffic. The share of fixed to mobile minutes was 13.4% while other/advanced minutes (which include premium rate minutes) represented 15.3% of all fixed voice traffic.

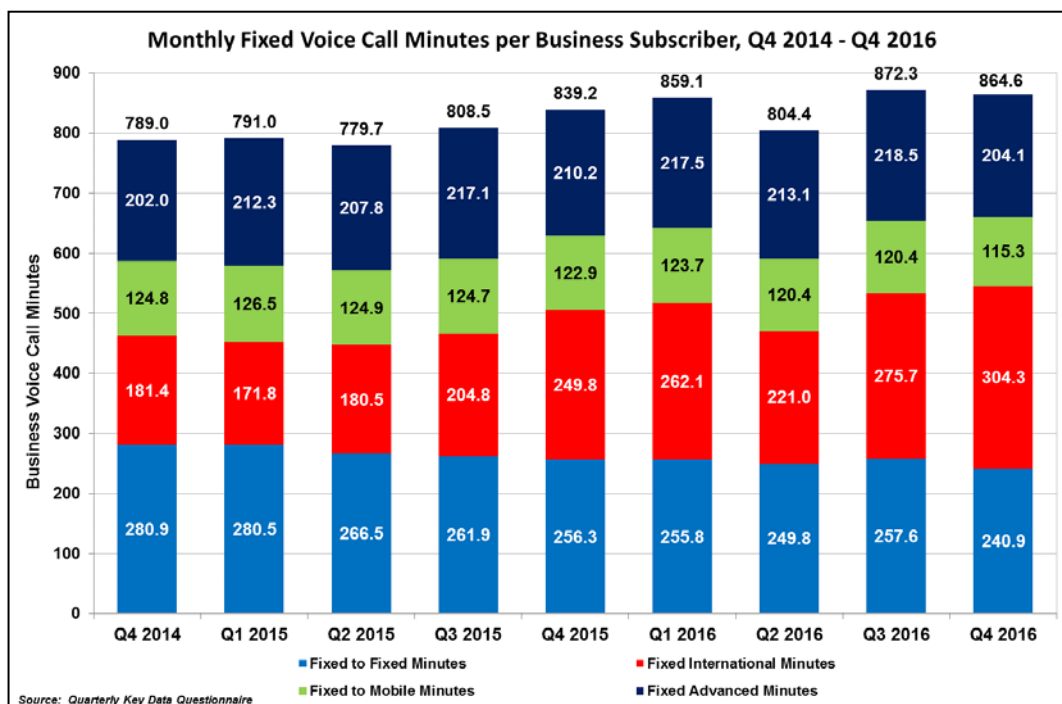
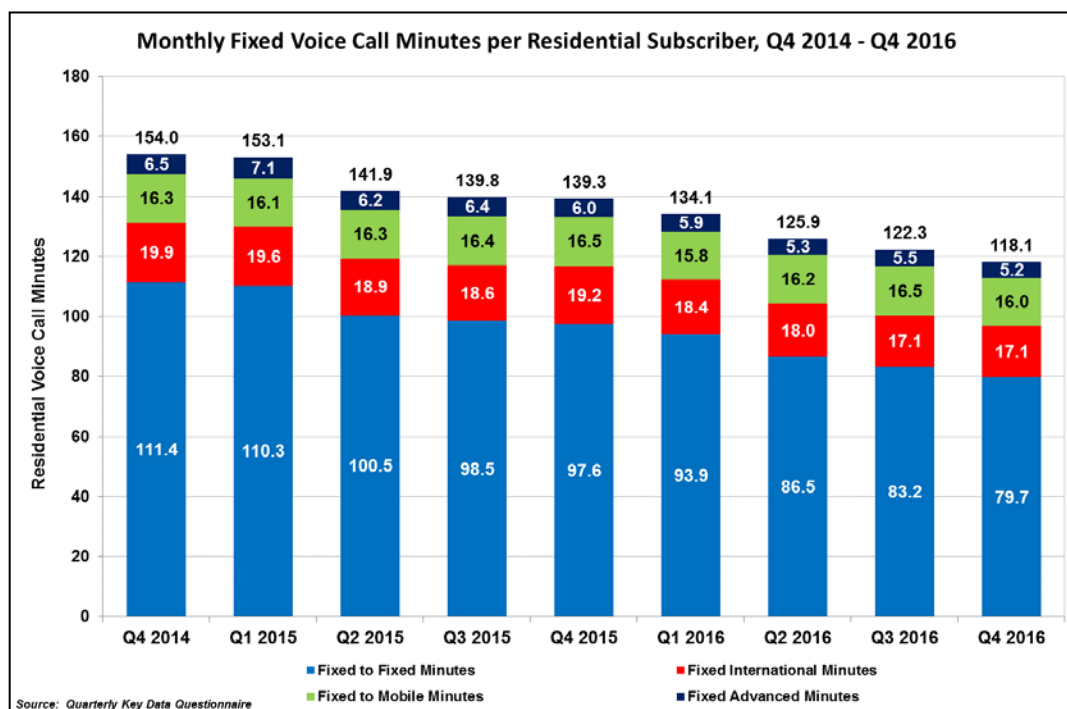
Figure 2.3.1 – Fixed Voice Call Volume (Minutes)³⁰



Figures 2.3.2 and 2.3.3 show the change in the average monthly fixed voice call minutes per business and residential subscribers respectively. In Q4 2016 the average business subscriber made 864.6 minutes of voice calls. The average residential subscriber usage was 118.1 minutes per month.

²⁹ The revisions referred to in footnote 24 impacted fixed voice categories in figures 2.3.1 and 2.3.2.

³⁰ Domestic Calls include local & national calls. Advanced service and other minutes include minutes to premium rate numbers, freephone numbers, callsave, operator services, VPN minutes, payphones and other services.

Figure 2.3.2 – Fixed Voice Call Volume per Business Subscriber (Minutes)**Figure 2.3.3 – Fixed Voice Call Volume per Residential Subscriber (Minutes)**

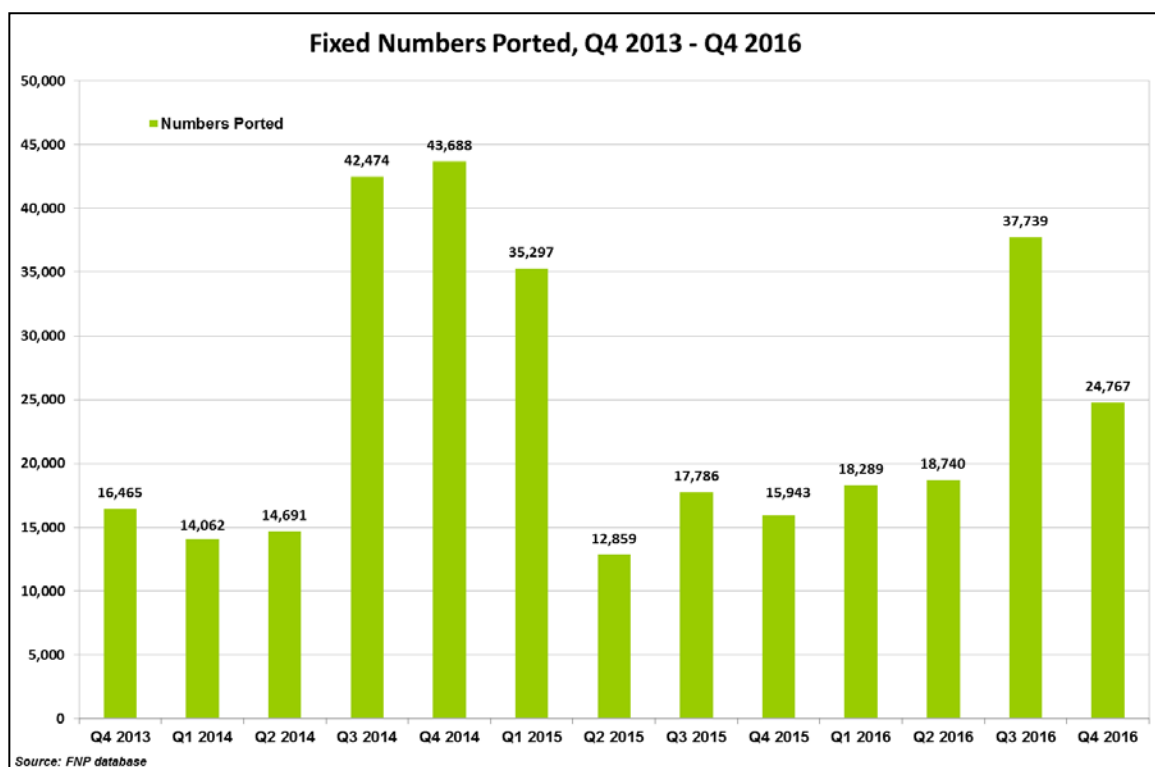
2.4 Fixed Number Portability

Figure 2.4.1 illustrates the number of fixed numbers (geographic and non-geographic) ported between Irish fixed voice service providers since Q4 2013. Fixed Number Portability (FNP) allows consumers to switch fixed voice provider while retaining their fixed number.

In the quarter to December 2016, 24,767 numbers³¹ were ported between operators (99,102 numbers in the twelve months to December 2016). Over the last 12 months, an average of 24,776 numbers have been ported each quarter. ComReg notes a higher than normal quantity in the number of ported numbers in period Q3 2016³² as well as for periods Q3 2014 to Q1 2015³³.

ComReg notes that the fixed number portability database only records data on customers that retain their telephone number while switching between different fixed voice service providers' networks. Therefore, porting numbers presented in Figure 2.4.1 should not be considered as a full proxy for switching activity in the fixed voice market as switching between operators using the same underlying network for the provision of fixed voice services (e.g. where a retail customer switches service provider, but both service providers underlying retail services is provided on the same network – as in the case where retail services are provided over the same wholesale network) would not be recorded in the FNP database.

Figure 2.4.1 – Fixed Numbers Ported



³¹ Non-geographic number ports constitute less than 1% of total ports for Q4 2016.

³² Q3 2016 figures have been restated owing to an operator error in the reporting of ported fixed numbers. The quantity has been revised down for Q3 2016. See note 10 in the corrigendum of this report.

³³ This was due to an audit of the central reference database which records porting activity of fixed numbers.

2.5 Standalone Fixed Voice Service Pricing Data

ComReg uses independently collated Strategy Analytics (Teligen) pricing data using OECD-approved methodologies to examine the relative prices of a number of specific fixed voice usage baskets of national and international telecoms services for both residential and business users. The pricing data used for international comparisons currently includes pricing information for selected countries, namely Germany, Denmark, Spain, Netherlands and the United Kingdom³⁴.

For national comparisons, the prices advertised³⁵ by the largest operators (in terms of number of subscribers to standalone fixed voice services³⁶) during Q4 2016 were analysed³⁷ for selected usage baskets. In this Quarterly Key Data Report, standalone fixed voice service prices advertised by Eir, Sky, Digiweb, Pure Telecom and Vodafone (business tariffs) were analysed. Thus, the pricing analysis does not necessarily present the lowest prices available in the whole market, but rather the lowest prices offered by the operators having the largest number of subscribers.

For international comparisons, the prices advertised³⁸ by the largest operators (in terms of number of subscribers to standalone fixed voice service) in each of the respective countries during Q4 2016 were analysed³⁹ for selected usage baskets⁴⁰ (with an average per country price presented based on the average of lowest price tariffs advertised by three highest ranking operators in national pricing comparisons). In order to enable international comparisons, prices are presented in Euro Purchasing Power Parities (PPPs) and exclude VAT charges. PPPs provide an indication of the cost of telecoms services in countries analysed in relation to the cost of all other products and services.

The presented national and international comparison analysis incorporates discounts offered by operators. Nonrecurring charges (e.g. charges for the installation of a service) are discounted/amortised over five years. Fixed recurring monthly costs such as

³⁴ In future Quarterly Key Data Reports ComReg may expand the analysis and include more countries for international price comparisons.

³⁵ The pricing analysis is based on a review of operators' advertised prices in the period Q4 2016.

³⁶ Standalone fixed voice services are voice services not sold as part of a bundle or other services.

³⁷ The subscribers of these operators jointly account for over 90% of all standalone fixed voice subscribers.

³⁸ The pricing analysis is based on a review of operators' advertised prices in the period Q4 2016.

³⁹ The subscribers of these operators jointly account for over 80% of all standalone fixed voice subscribers in each of the respective countries.

⁴⁰ The same basket was applied to each respective country in order to make the international comparison.

line rental and any other additional recurring charges are included. Calls to fixed, mobile and international destinations are included in the baskets.

The OECD basket methodologies are reviewed and revised periodically, with the latest revision made in early 2010⁴¹. For more detailed information on basket methodologies see ComReg's accompanying Memorandum, document 17/15a.

The following baskets are presented in this report⁴²:

Residential and Business Standalone Fixed Voice Service Baskets

Type of basket	Basket
Residential	60 calls (190 minutes)
Business	260 calls (606 minutes) basket

These baskets were selected given they most suitably corresponded (amongst the available OECD usage baskets) to the fixed voice usage patterns presented in figures 2.3.2 and 2.3.3 above. ComReg notes that these baskets reflect usage patterns of an average user and do not necessarily reflect prices of tariffs that are geared towards customers having different usage profiles.

ComReg notes that comparisons are based on the prices of advertised tariffs⁴³ only and the analysis does not take into consideration other potentially important factors such as quality of the network, level of customer care, additional units of consumption available after having accounted in the analysis for the units in the OECD usage basket, minimum contract term etc.

OECD Residential Standalone Fixed Voice Service Basket

Figure 2.5.1 compares tariffs advertised by standalone fixed voice service providers for residential customers based on a basket of 60 calls (190 minutes)⁴⁴. Pure Telecom offers the cheapest tariff for this particular basket at €35.86, followed by Digiweb (€40.72) and Sky (€43.25).

⁴¹ See <http://www.oecd.org/sti/broadband/48242089.pdf>

⁴² In future Quarterly Key Data Reports ComReg may expand the analysis and present price comparisons based on additional and/or different usage baskets.

⁴³ Tariffs publically advertised during Q4 2016.

⁴⁴ Basket assumes the usage of 150 fixed to fixed minutes, 25 fixed to mobile minutes and 15 international minutes.

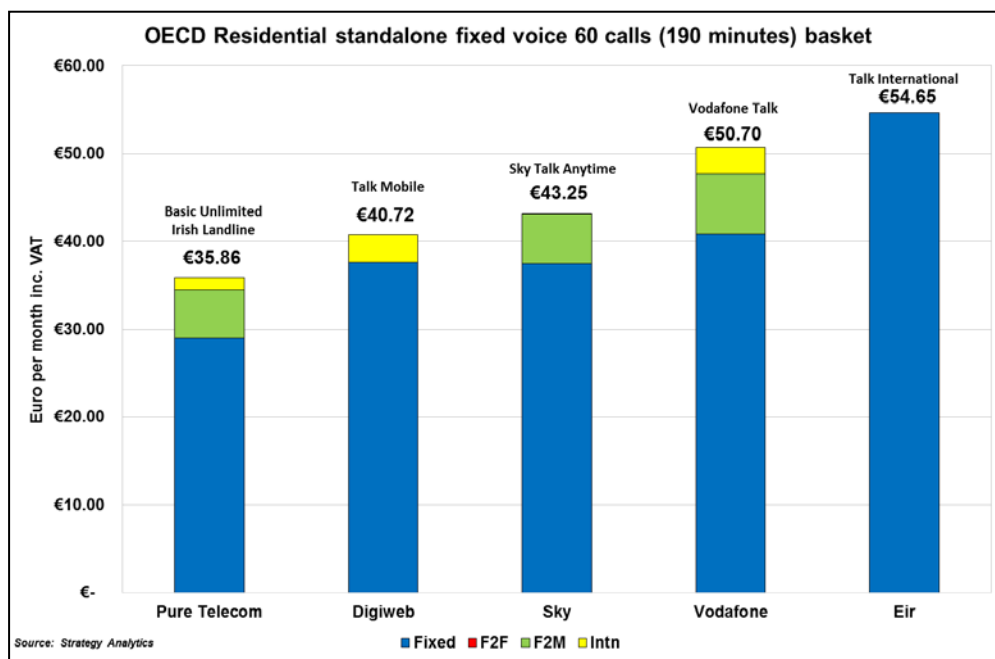
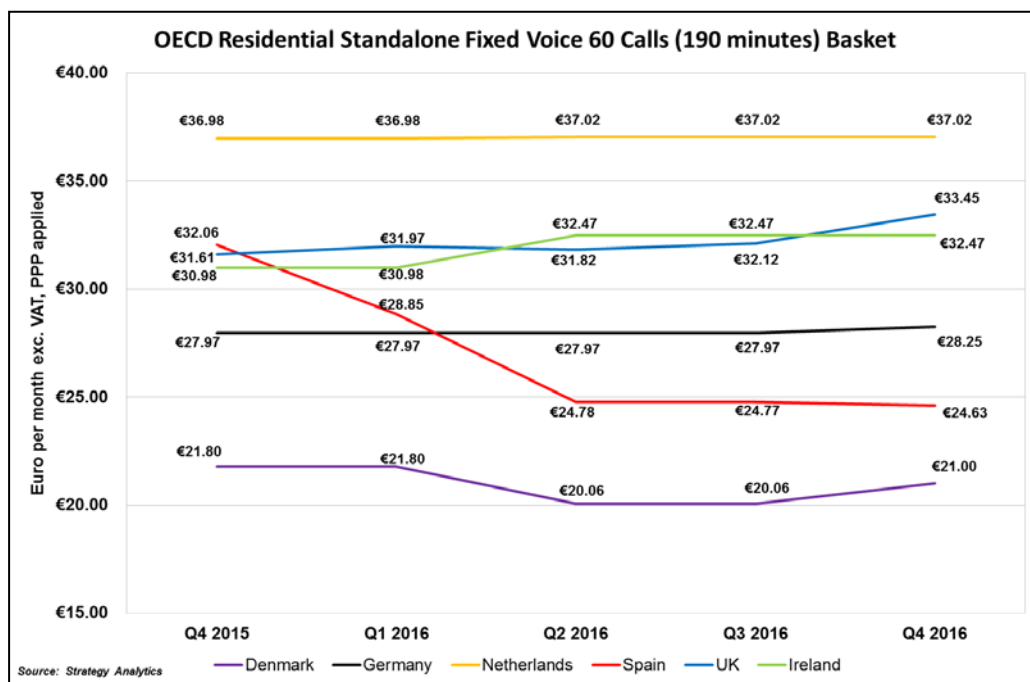
Figure 2.5.1 - Residential Standalone Fixed Voice Basket (National)

Figure 2.5.2 illustrates Ireland's ranking alongside five other Western European countries with respect to prices for residential standalone fixed voice services. In Q4 2016 Ireland ranked in fourth place with an average price of €32.47⁴⁵ for this particular basket. The average price in Ireland is 10.2% more expensive than the average price⁴⁶ for all of the countries included in the analysis.

Figure 2.5.2 - Residential Standalone Fixed Voice Basket (International)

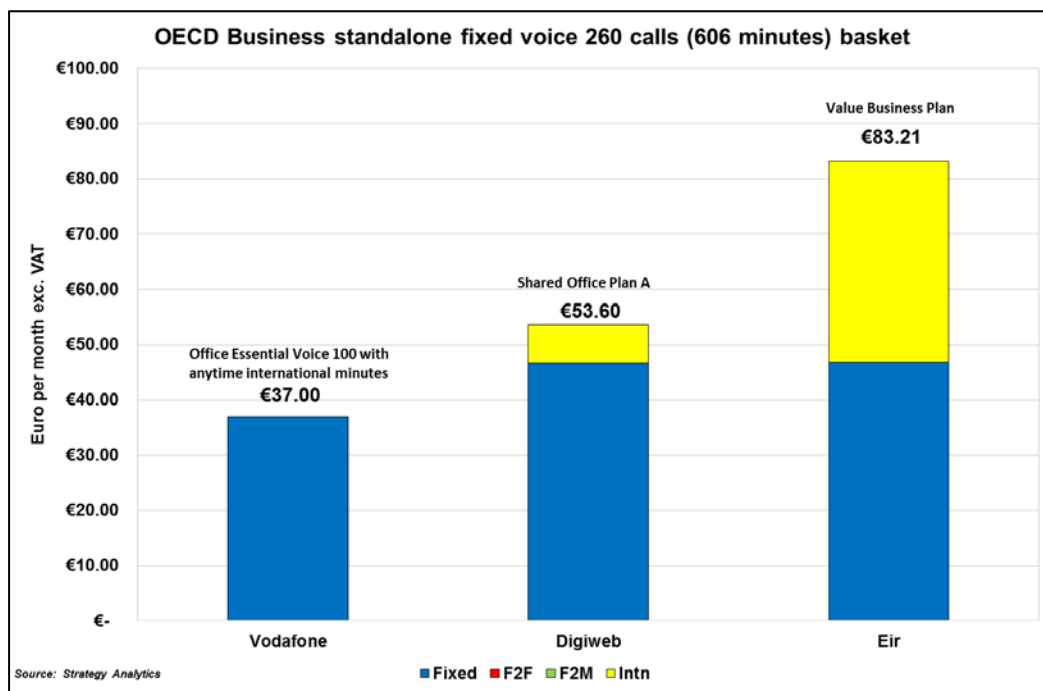
⁴⁵ As noted previously, average prices used for international comparisons exclude VAT charges.

⁴⁶ The average of prices presented in Figure 2.5.2. Prices include line rental.

OECD Business Standalone Fixed Voice Service Basket

Figure 2.5.3 compares tariffs advertised by standalone fixed voice service providers⁴⁷ for business customers based on a basket of 260 calls (606 minutes)⁴⁸. Presented prices exclude VAT charges. Vodafone offers the cheapest tariff for this particular basket at €37.

Figure 2.5.3 - Business Standalone Fixed Voice Basket (National)

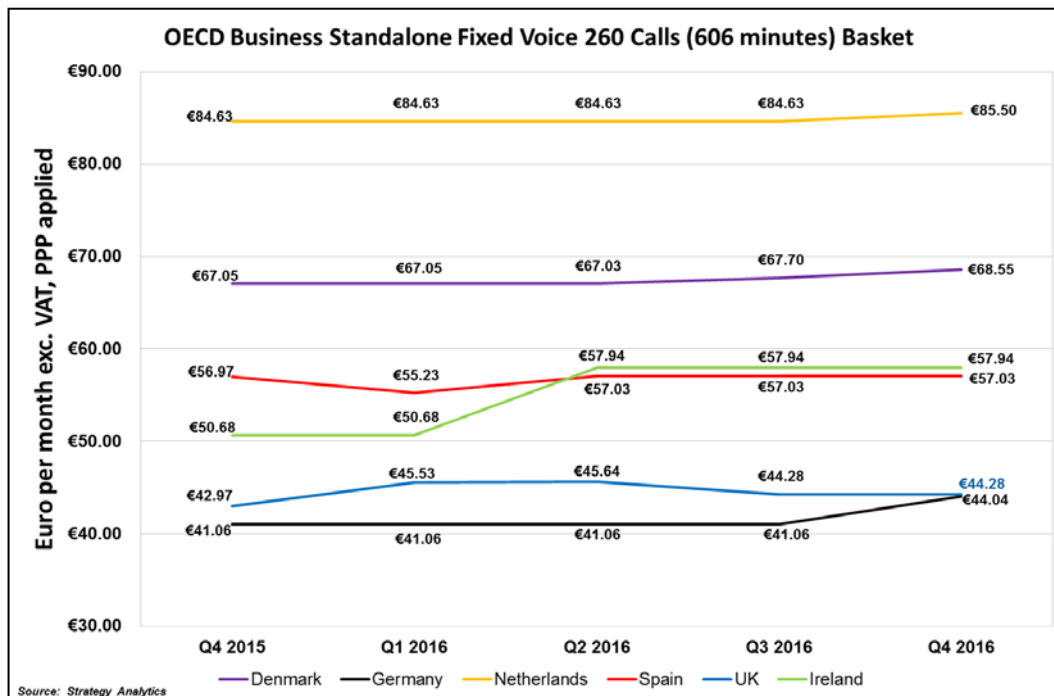


⁴⁷ In this Quarterly Key Data Report only tariffs advertised by Vodafone, Digiweb and Eir were analysed for business customers. This can arise for reasons such as operators not offering fixed voice services to business customers or not advertising prices publicly. ComReg may expand the analysis and include additional operators in the future Quarterly Key Data Reports.

⁴⁸ Basket assumes the usage of 402 fixed to fixed minutes, 116 fixed to mobile minutes and 88 international minutes.

Figure 2.5.4 shows that Ireland (€57.94⁴⁹) ranks in third place. The average price in Ireland is 2.7% cheaper than the average price⁵⁰ for all of the countries included in the analysis.

Figure 2.5.4 - Business Standalone Fixed Voice Basket (International)



⁴⁹ As noted previously, average prices used for international comparisons exclude VAT charges.

⁵⁰ The average of prices presented in Figure 2.5.4.

3. Broadband Services

3.1 Total Broadband⁵¹ Subscriptions and Provision of Broadband Services

Figure 3.1.1 shows the total number of broadband subscriptions⁵² in Ireland as of Q4 2016. At the end of December 2016, there were 1.71 million active broadband subscriptions in Ireland. This was an increase of 0.3% on the previous quarter and 0.1% increase since December 2015.

There was an increase in total fixed line broadband subscriptions this quarter (up by 17,582) but a decrease in mobile broadband subscriptions (down by 12,042 subscriptions). ComReg reports active dedicated mobile broadband subscriptions and does not include Internet access over mobile handsets within these numbers.

VDSL⁵³ (up by 7.8%), FWA (up by 9.3%), FTTP⁵⁴ (up by 20.2%) and cable subscriptions (up by 0.1%) showed positive growth this quarter. DSL⁵⁵ (down by 5.3%), satellite (down by 0.5%) and mobile broadband (down by 3.3%) all fell this quarter. It is likely that some or all of the DSL reductions are accounted for by consumers switching to VDSL based broadband services.

Figure 3.1.1 – Total Number of Active Broadband Subscriptions

Subscription Type	Q4 2016	Quarterly Growth Q3'16 – Q4'16	Year-on-Year Growth Q4'15 – Q4'16
DSL Broadband	435,253	-5.3%	-17.0%
VDSL Broadband	498,844	+7.8%	+40.0%
Cable Broadband	366,699	+0.1%	-1.9%
FTTP	7,623	+20.2%	38.8% ⁵⁶
Satellite	5,291	-0.5%	-9.5%
FWA Broadband	46,599	+9.3%	+7.6%
Total Fixed broadband	1,360,309	+1.3%	+3.9%
Mobile Broadband	349,421	-3.3%	-12.5%
Total Broadband	1,709,730	+0.3%	+0.1%

⁵¹ ComReg notes that the data provided in this section relates to active subscriptions reported by operators. It takes into account multiple active subscriptions to broadband offerings by individual subscribers.

⁵² There were also 2,903 narrowband Internet subscriptions in Q4 2016.

⁵³ VDSL refers to very-high-bit-rate digital subscriber line. These lines are typically utilised in the provision of next generation broadband services.

⁵⁴ FTTP (fibre to the premises) refers to a range of fibre access installations such as fibre to the home (FTTH), fibre to the premises (FTTP) and fibre to the curb.

⁵⁵ DSL refers to a digital subscriber line, the means by which broadband speeds (i.e. in excess of 144k downstream) are delivered over the copper telecoms network.

⁵⁶ From Q3 2016 ComReg has separately broken out FTTP and satellite subscriptions. In previous quarters such subscriptions were included in the 'Other' category. For the first time, Q3 2016 and Q4 2016 figures also include retail FTTP subscriptions based on Siro's wholesale sources. Figures presented should not therefore be interpreted as demonstrating year-on-year growth.

Figure 3.1.2 profiles broadband subscriptions in Ireland using the subscription type classifications of outlined in Figure 3.1.1.

Figure 3.1.2 – Total Broadband Subscriptions

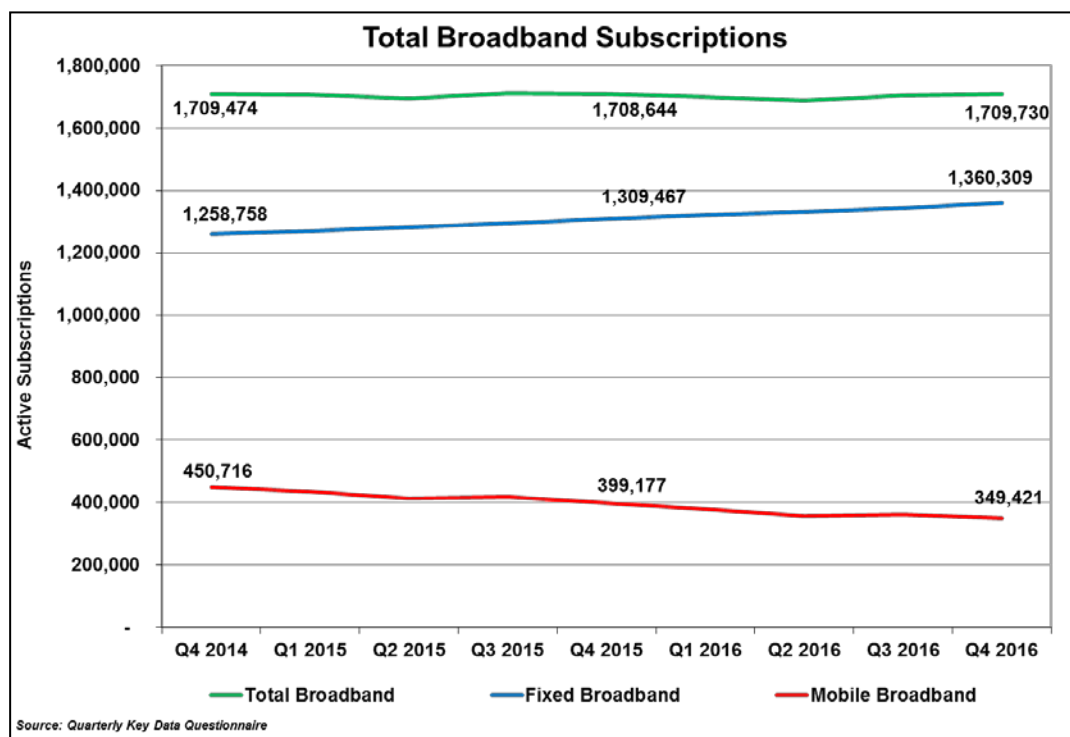
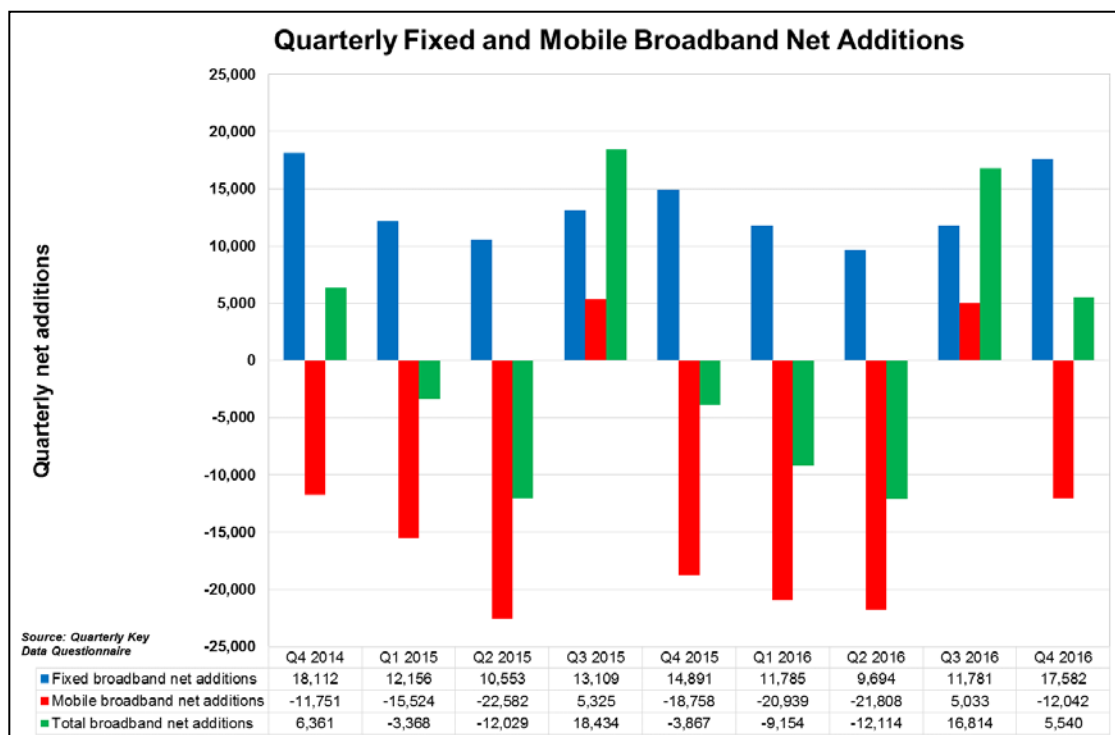


Figure 3.1.3 shows the quarterly growth in fixed and mobile broadband subscriptions since Q4 2014. In general, there has been a steady growth of fixed broadband subscriptions and a decline of mobile broadband subscriptions. It should be noted that ComReg reports on active broadband subscriptions and the mobile broadband subscription numbers reported by ComReg do not include internet access over mobile handsets (such as smartphones).

Figure 3.1.3 – Quarterly Growth in Broadband Subscriptions

Since Q3 2016, VDSL subscriptions have accounted for the largest share of broadband subscriptions, (27.1%) with this increasing to 29.2% in Q4 2016. The continuous increase in VDSL subscriptions is likely to be largely accounted for by consumers switching from DSL based broadband services. DSL accounted for 25.5% of all broadband subscriptions in Q4 2016 down from 30.7% in Q4 2015. The share of mobile broadband subscriptions has declined to 20.4% of all broadband subscriptions, down from 23.4% in Q4 2015. Cable has a 21.4% share of all broadband subscriptions down from 21.9% in Q4 2015. FWA has a 2.7% share of broadband subscriptions up slightly from 2.5% in Q4 2015. The remainder consists of satellite with a 0.31% share of broadband subscriptions, slightly down from 0.34% in Q4 2015, while FTTP has a 0.45% share of broadband subscriptions in Q4 2016, up from 0.32% in Q4 2015⁵⁷.

Figure 3.1.4 illustrates the split by type of broadband subscriptions in the Irish market since Q4 2015, while Figure 3.1.5 shows the net additions to broadband subscriptions by each platform. The net total number of broadband subscriptions has increased this quarter, driven mainly by increases in VDSL and FWA subscriptions.

⁵⁷ As noted on page 30, additional FTTP subscriptions in this report are, for the first time, included from Q3 2016. Figures presented should not therefore be interpreted as demonstrating year-on-year growth.

Figure 3.1.4 – Broadband Subscriptions by Platform

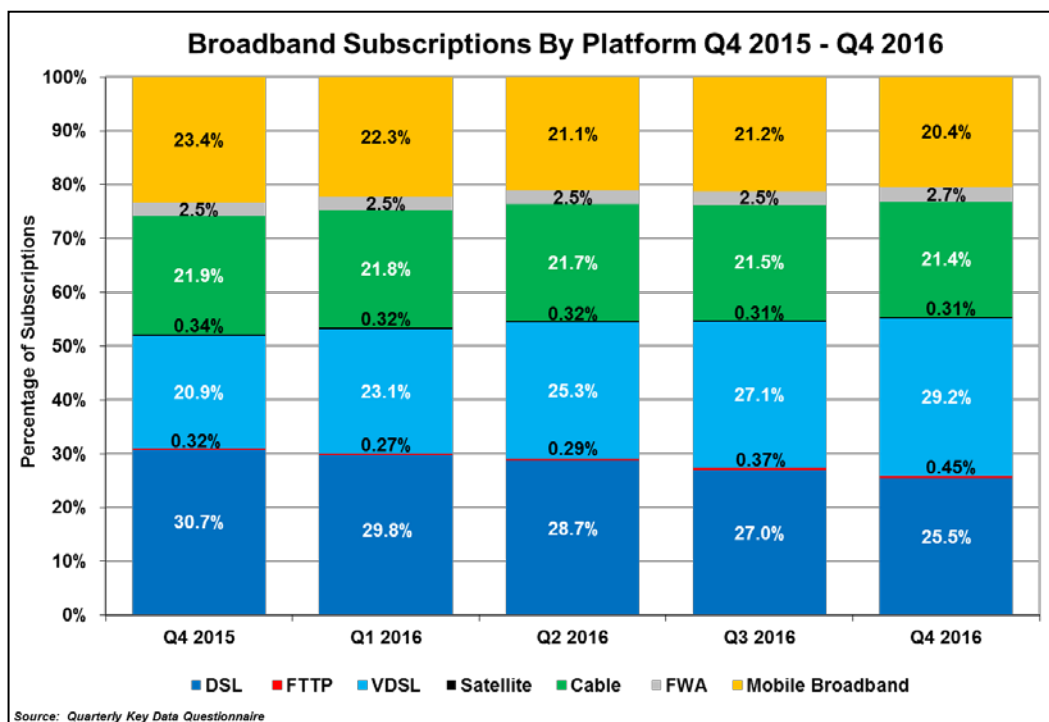


Figure 3.1.5 – Broadband Subscriptions - Net additions

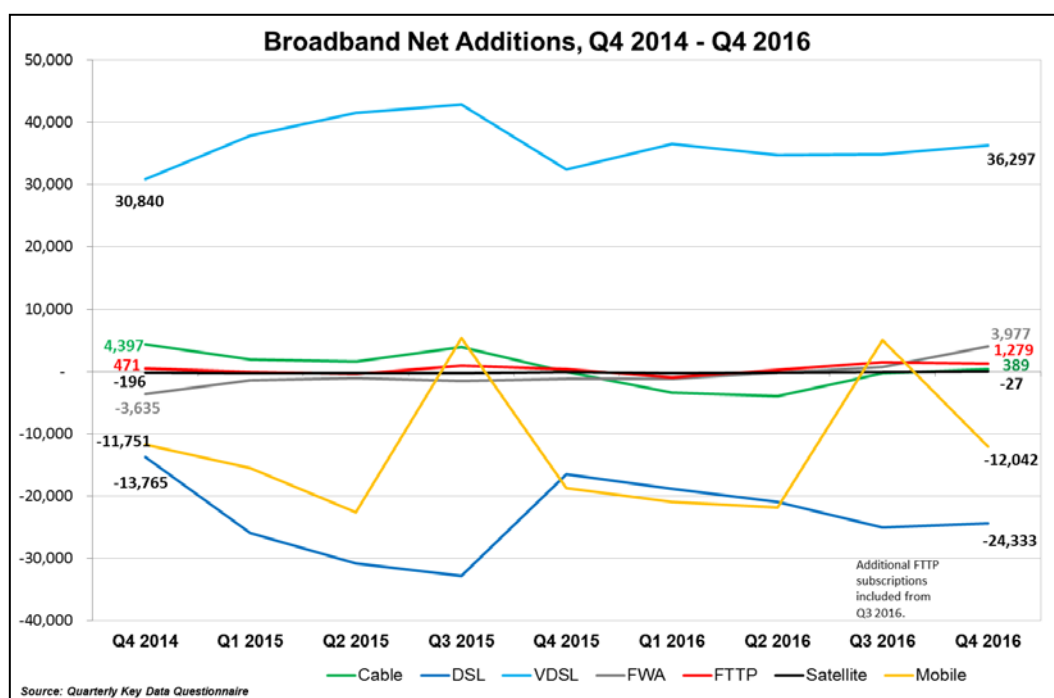


Figure 3.1.6 provides an estimate of the proportion of business and residential subscriptions to DSL, VDSL, cable, FWA, mobile broadband, fibre and satellite

broadband services⁵⁸. In Q4 2016, 82.9% of broadband subscriptions on all platforms were classed as residential broadband subscriptions. The platform with the highest percentage of residential vis-à-vis business subscriptions is cable broadband, while the mobile broadband category has the highest percentage of business customers.

Figure 3.1.6 – Broadband Subscriptions by Subscription Type

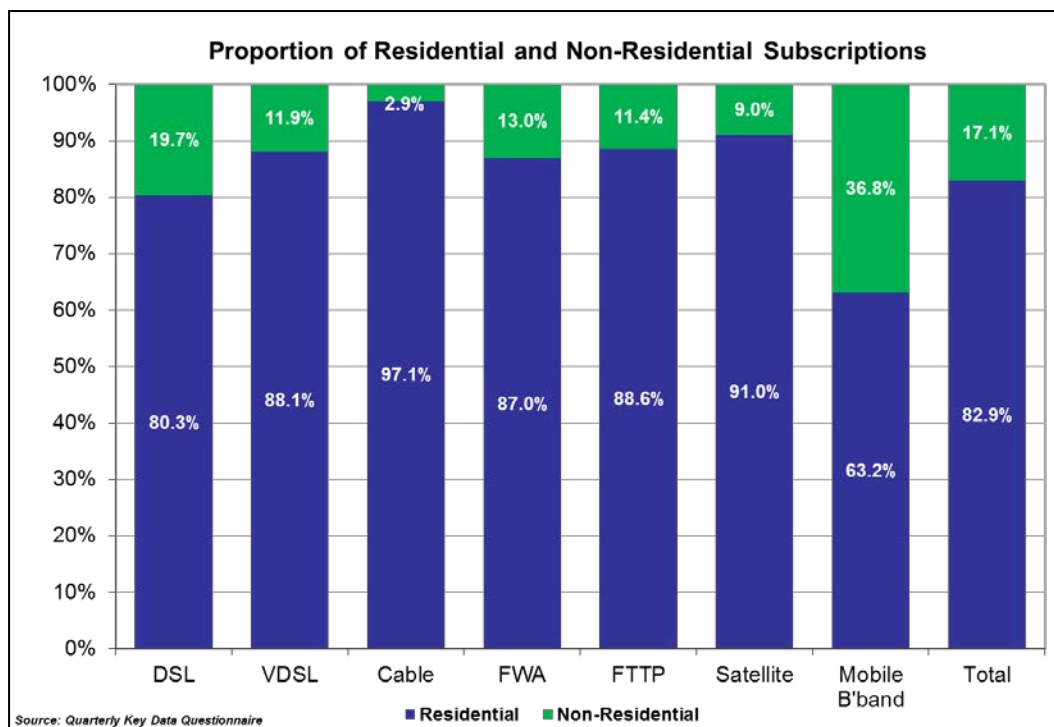


Figure 3.1.7 illustrates the breakdown of broadband subscriptions by advertised (headline) speed across all fixed broadband platforms (mobile broadband is excluded). In total, approximately 64.9% of broadband subscriptions were ≥ 30 Mbps (with 21.6% ≥ 100 Mbps). This equates to approximately 67.8% (with 24.1% ≥ 100 Mbps) of residential subscriptions and 44.1% (with 2.9% ≥ 100 Mbps) of business subscriptions.

The data suggests that most business users now subscribe to broadband services with advertised download speeds of between 30Mbps - 100Mbps, (prior to Q4 2016 this was 2Mbps - 10Mbps). Most residential users continue to subscribe to broadband services with speeds of between 30Mbps - 100Mbps. This may be due in part to Virgin Media primarily serving the residential market rather than business market as evidenced in Figure 3.1.6 above. Many larger business users access their broadband services over dedicated leased lines. Leased lines are not included in these charts. Leased line speeds can range up to speeds in excess of 1 gigabyte per second.

⁵⁸ ComReg revised the methodology employed to calculate DSL and VDSL (residential and business) subscriptions in Q2 2016. Revisions to historical data have been made.

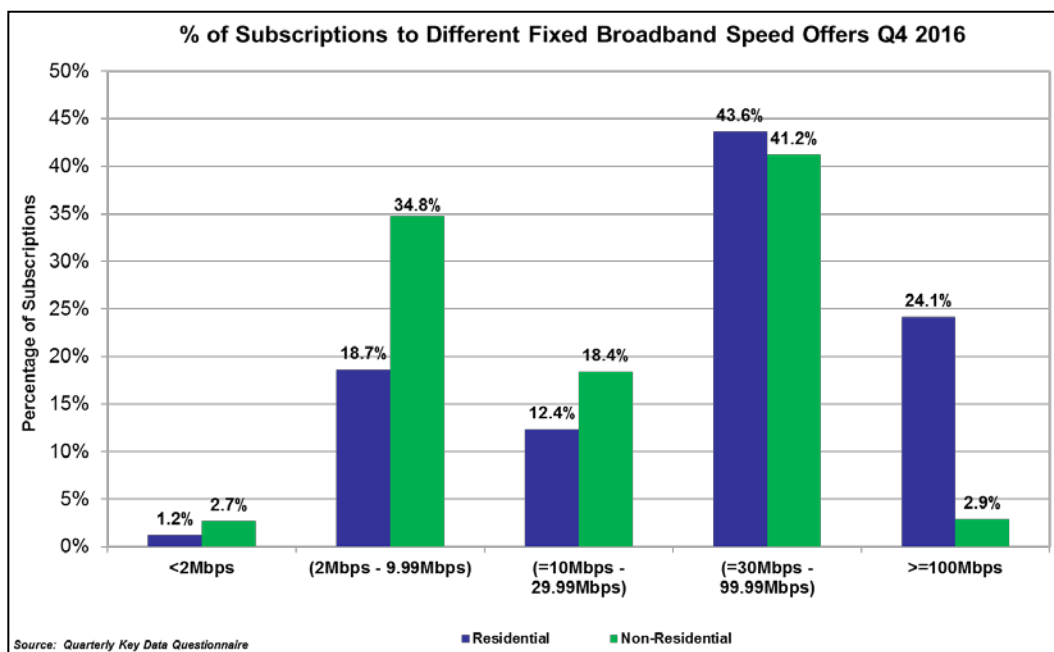
Figure 3.1.7 – Fixed Broadband Download Speeds and Subscription Type

Figure 3.1.8 shows broadband subscriptions by advertised (headline) speed and the type of broadband platform subscribed to.

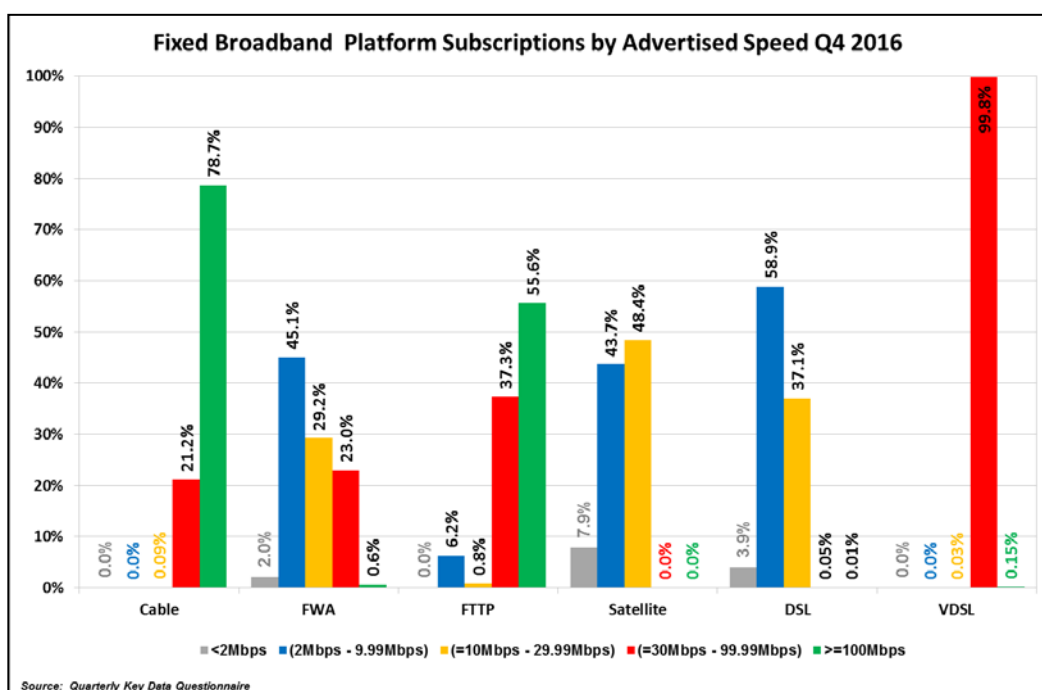
Figure 3.1.8 – Fixed Broadband Download Speeds and Platform⁵⁹

Figure 3.1.9 shows the change in fixed broadband subscriptions by advertised (headline) download speeds between Q4 2014 and Q4 2016⁶⁰. Over the entire period, growth in

⁵⁹ *Estimated percentage split.

broadband speeds has been mainly in subscriptions with speeds above 30Mbps. The share of these subscriptions has increased from 56.1% in Q4 2015 to 64.9% in Q4 2016.

Figure 3.1.9 – Fixed Broadband Subscriptions by Advertised (Headline) Download Speeds

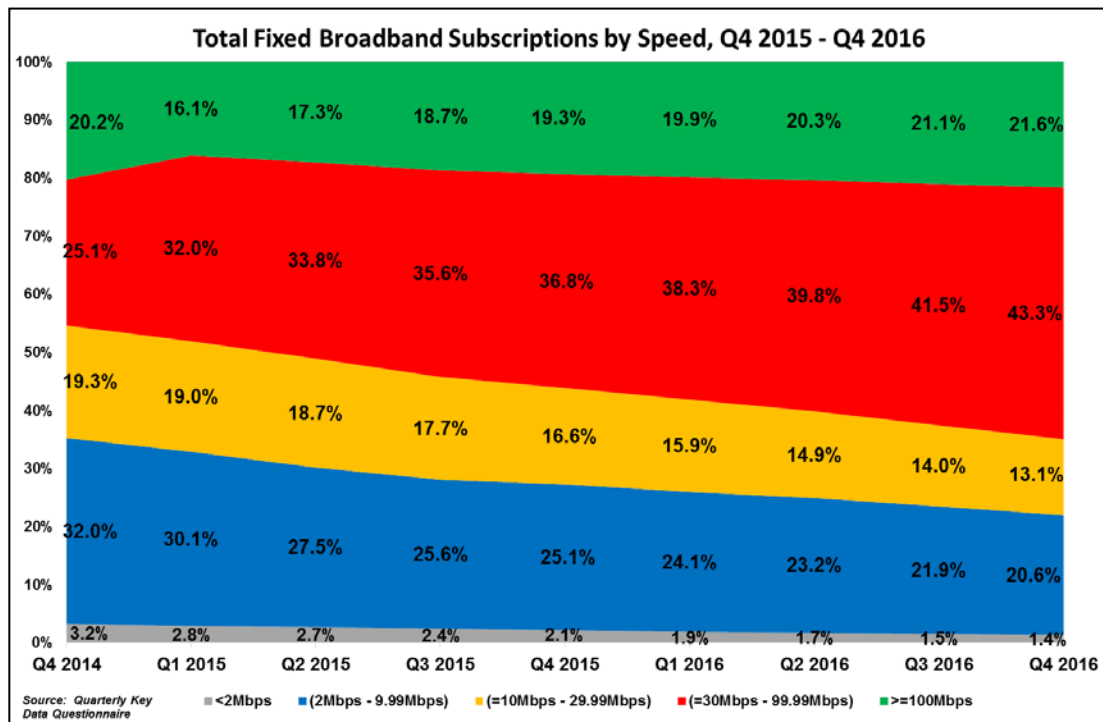


Figure 3.1.10 provides the market shares of fixed broadband operators by number of subscriptions. DSL, VDSL cable modem, FWA, satellite and fibre subscriptions are used to calculate fixed broadband market shares.

Operators with a market share of 2% or more are shown in the chart below. All those operators with less than 2% of total fixed broadband subscriptions are grouped together under the heading 'OAOs'.

According to the data received from operators for Q4 2016, Eir had 32.6% of total fixed broadband subscriptions, followed by Virgin Media who had 26.8% of subscriptions. Vodafone had 19.7% (excluding mobile broadband subscriptions) and Sky Ireland had an 11.8% market share. All other OAOs combined accounted for the remaining 9.1% share of fixed broadband subscriptions.

⁶⁰ ComReg revised the methodology employed to calculate DSL and VDSL (residential and business) subscriptions in Q2 2016. This also applies to broadband speeds. Revisions to historical data have accordingly been made.

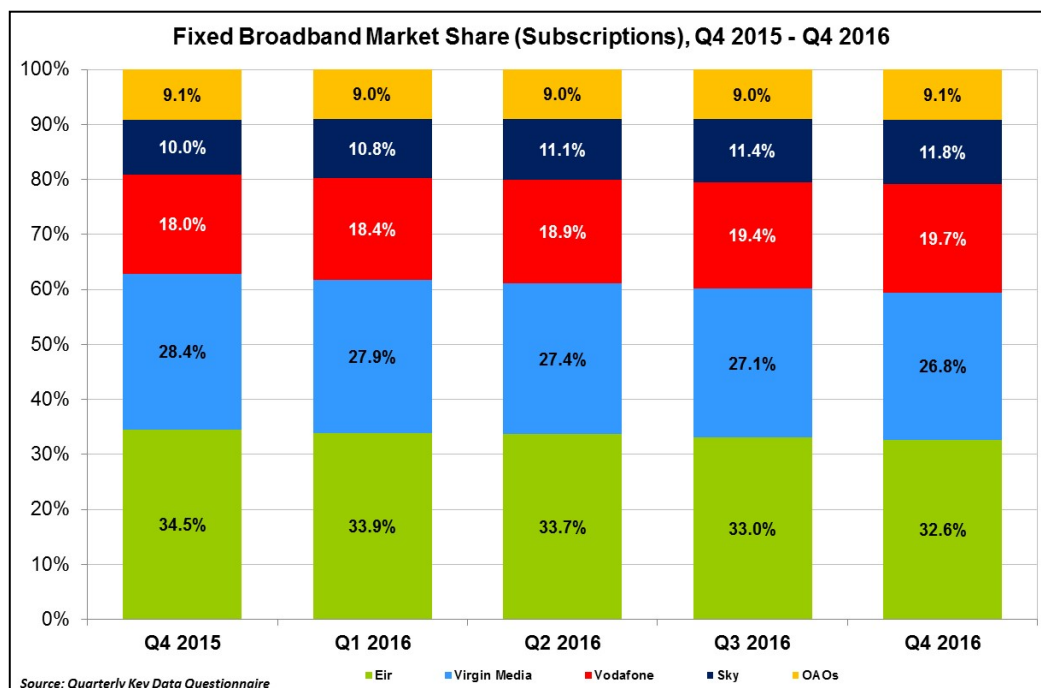
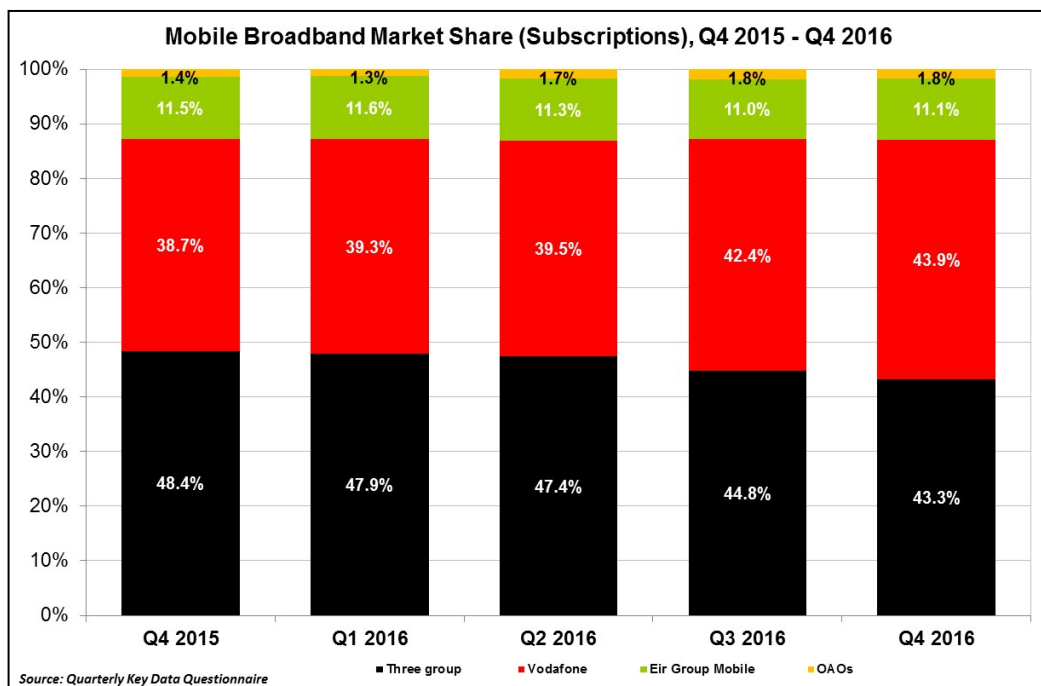
Figure 3.1.10 – Subscription Market Share of Fixed Broadband Market

Figure 3.1.11 shows the market share of mobile broadband operators by subscriptions. As of Q4 2016, Vodafone had the largest share with 43.9%. Three Group's market share was 43.3%, down from 48.4% in Q4 2015. Eir Group Mobile had a market share of 11.1% down from 11.5% in Q4 2015 while OAOs accounted for the remaining 1.8%.

Figure 3.1.11 – Subscription Market Share of Mobile Broadband Market

3.2 Provision of DSL Access

Figure 3.2.1 examines the provision of DSL access. DSL broadband services are provided to consumers by operators using three alternative methods of access. DSL may be provided directly to the consumer by Eir using direct access to its network; this accounted for 44.1% of all DSL subscriptions in Q4 2016. Eir's market share of retail DSL lines has declined by 2.6 percentage points over the last year. Retail DSL may also be provided by OAOs who use either Eir's wholesale bitstream source, which enables OAOs to resell another operator's DSL service, or by offering DSL-based broadband using local-loop unbundling (LLU).

In Q4 2016, 43.1% of all DSL lines were provided by OAOs using wholesale bitstream. In absolute terms there were 187,560 wholesale bitstream lines, a decrease of 12.4% since Q4 2015. The remaining 12.8% of DSL lines were provided to subscribers by OAOs using local-loop unbundling. In Q4 2016 there were 55,938 unbundled local loops, down from 65,316 in Q4 2015 and down from 56,499 in Q3 2016.

Figure 3.2.1 - Provision of DSL Access

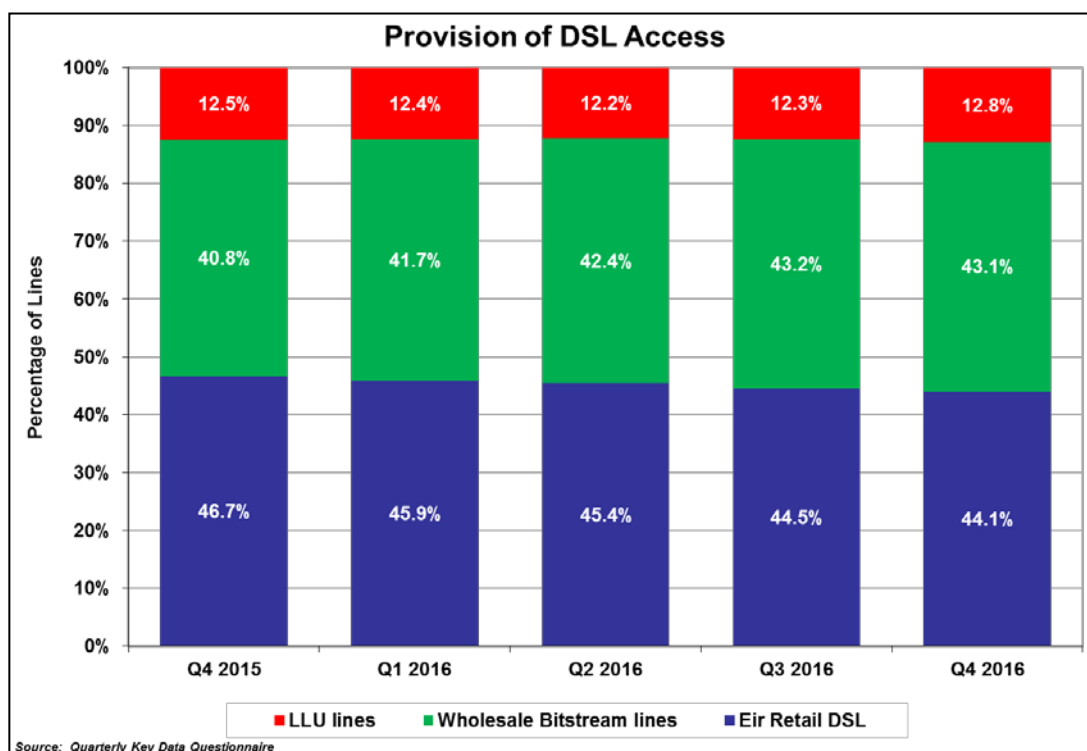
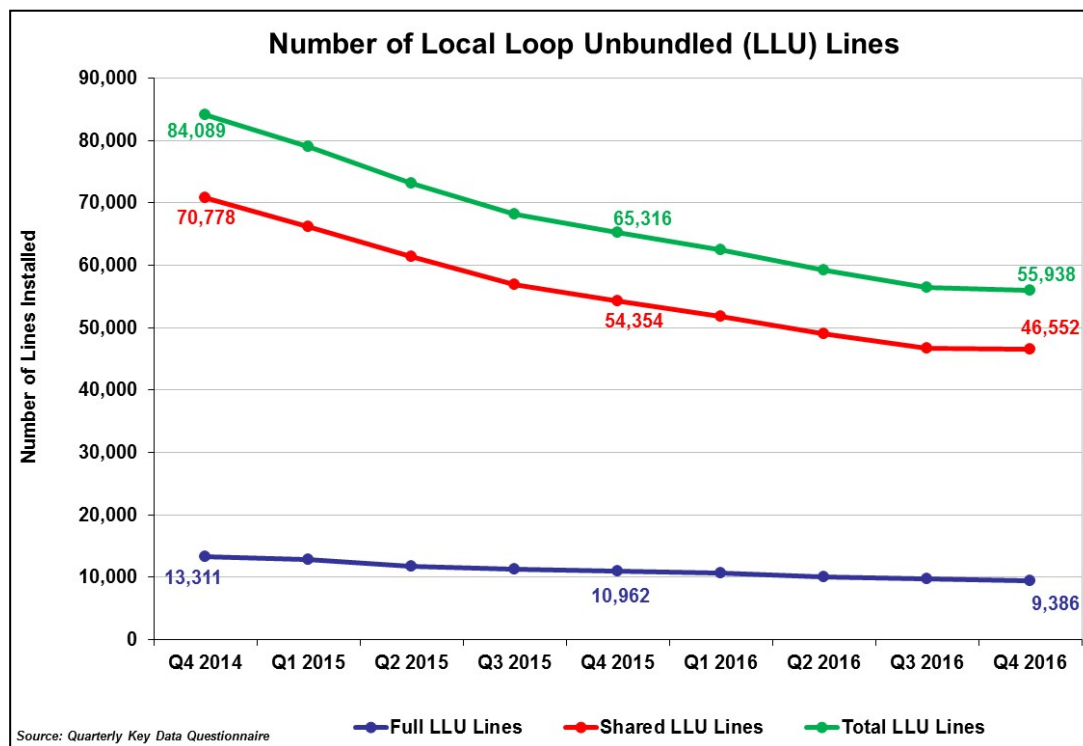


Figure 3.2.2 shows the number of unbundled lines according to their shared and full⁶¹ unbundling status. Between Q4 2015 and Q4 2016 the total number of LLU lines

⁶¹ Full LLU and shared LLU are two ways a copper loop may be unbundled. While full LLU assigns the entire copper loop to the leasing operator, shared LLU enables other operators and the incumbent to share the same line. With shared access consumers can acquire voice and data services from an operator or alternatively data services alone while retaining the voice services of the incumbent.

decreased by 14.4% and declined by 1.0% since Q3 2016. Full LLU lines also decreased by 14.4% since Q4 2015 and declined by 4.4% since Q3 2016. Similarly shared LLU lines decreased by 14.4% since Q4 2015 and declined by 0.4% since Q3 2016.

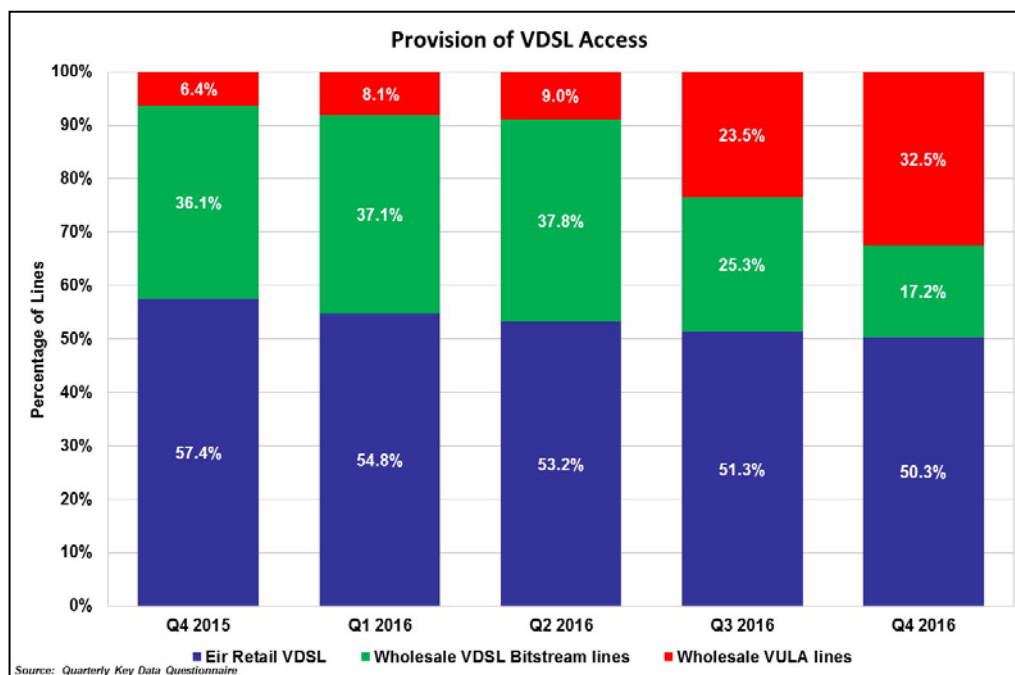
Figure 3.2.2 – Number of Unbundled Local Loops



3.3 Provision of VDSL Access

VDSL broadband services are provided to consumers by operators using three alternative methods of access. VDSL may be provided directly to the consumer by Eir using direct access to its network; this accounted for 50.3% of all VDSL subscriptions in Q4 2016. Eir's market share of retail VDSL lines has declined by 7.1 percentage points over the last year. Retail VDSL may also be provided by OAOs who use either wholesale bitstream, which enables OAOs to resell another operator's VDSL service, or by offering VDSL-based broadband using virtual unbundled local access (VULA).

In Q4 2016, 17.2% of all VDSL lines were provided by OAOs using wholesale bitstream. In absolute terms there were 85,822 wholesale VDSL bitstream lines in Q4 2016, a decrease of 33.3% since Q4 2015. The remaining 32.5% of VDSL lines were provided to subscribers by OAOs using VULA. In Q4 2016 there were 162,194 VULA lines, up from 22,894 in Q4 2015 (+608%) and up from 108,557 in Q3 2016 (+49.4%).

Figure 3.3.1 – Provision of VDSL Access

3.4 Usage of Broadband Services

Figure 3.4.1 shows data volumes generated by fixed and mobile broadband subscribers as well as subscribers to mobile voice and data services. Fixed broadband volumes alone reached 438,638 terabytes while mobile data volumes were over 56,214 terabytes⁶².

Figure 3.4.1 – Fixed Broadband and Mobile Data Volumes

	Q4'16 (TBs)	Q3'16 – Q4'16 Growth	Q4'15 – Q4'16 Growth
Fixed broadband data volumes⁶³	477,649	+8.8%	34.0%
Mobile data volumes⁶⁴	54,002	+16.4%	+76.4%
Total data volumes	494,909	+8.8%	+41.8%

Figure 3.4.2 illustrates average monthly data usage volumes by subscription type. In Q4 2016 an average fixed broadband subscriber used 117.0 GB of data per month. The majority of traffic is generated by residential subscribers with an average monthly data usage per residential subscriber reaching 125.4 GB in Q4 2016. An average business fixed broadband subscriber used 55.6 GB of data per month in Q4 2016. In comparison, average traffic per smartphone reached 3.4GB of data while the average traffic per dedicated mobile broadband subscriber was 9.3 GB of data.

⁶² Mobile data volumes refer to traffic generated from mobile broadband plus mobile voice and data services.

⁶³ This figure consists of aggregated data volumes from various subscription types. For Q3 2015 to Q4 2016 data generated via cable broadband is based on estimates. For Q4 2016 data generated via FWA broadband is partially based on an estimate. See bullet points 1 and 2 in Notes to data on page 8 of this report.

⁶⁴ Mobile data volumes were revised in Q4 2016. See note 3 in the corrigendum of this report.

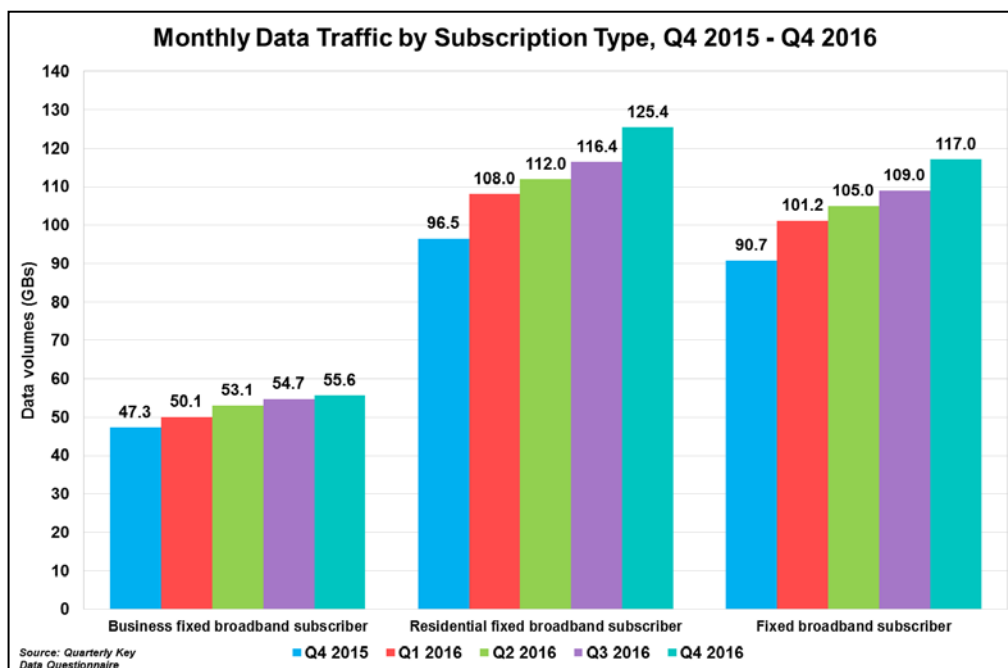
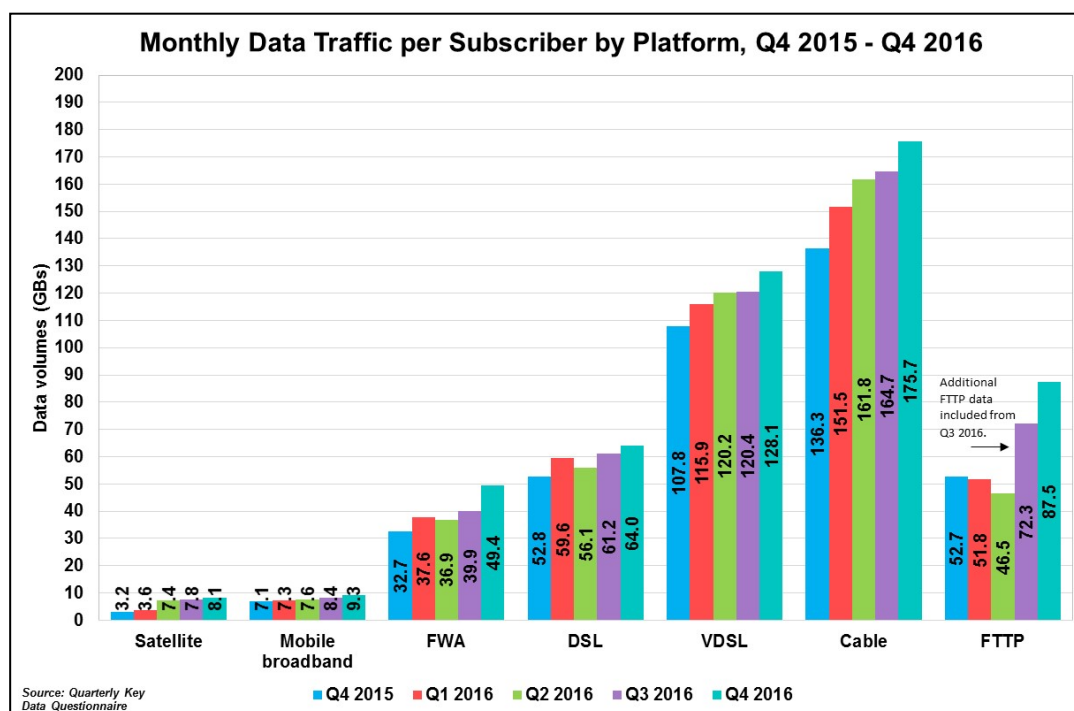
Figure 3.4.2 – Monthly Traffic per Fixed Broadband Subscription by Type

Figure 3.4.3 provides a breakdown of average monthly data usage volumes by broadband platform. In Q4 2016 the average cable broadband subscriber used 175.7 GB of data per month followed by a VDSL subscriber (128.1 GB), followed by a FTTP subscriber (87.5 GB) and a DSL subscriber (64.0 GB). It can be observed from Figure 3.4.3 that the average volume of data used increases with download speed as cable, VDSL and FTTP broadband platforms have the highest proportion of high speed broadband subscriptions as noted in Figure 3.1.8.

Figure 3.4.3 – Monthly Traffic per Broadband Subscription by Platform

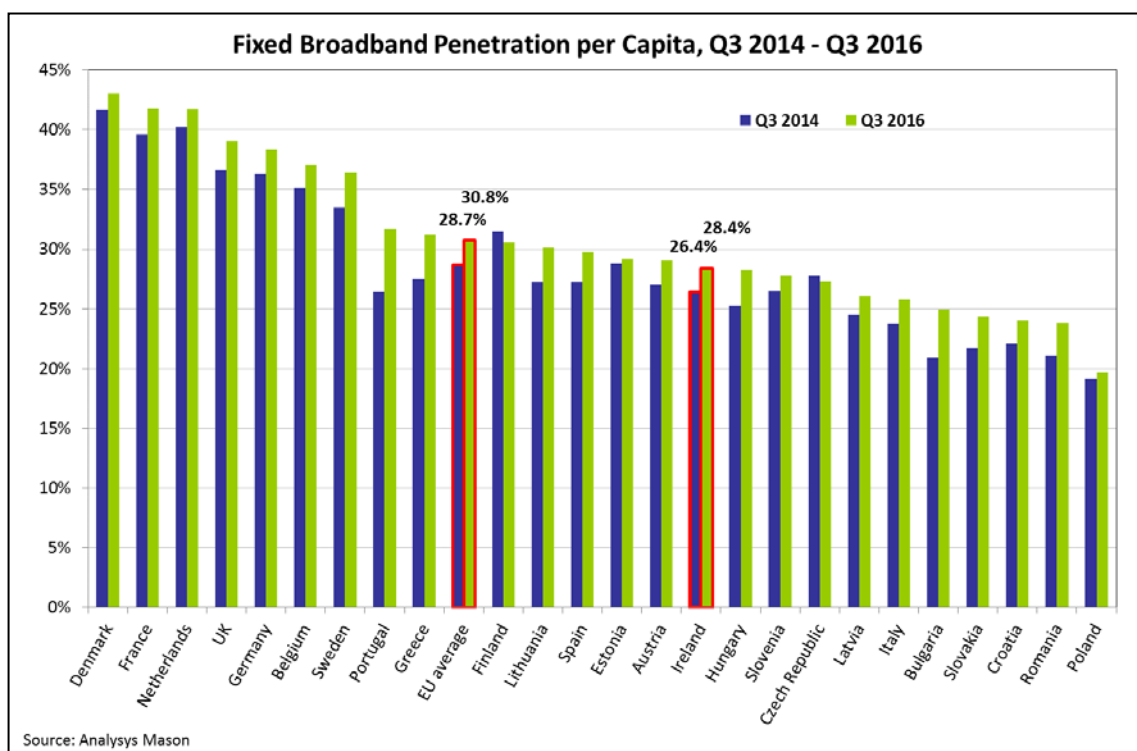
3.5 Broadband Penetration

The total number of broadband subscriptions in Ireland for Q4 2016 was 1,709,730. Using fixed residential broadband subscriptions only, 1,197,255 (i.e. excluding business subscriptions and mobile broadband subscriptions), the estimated fixed broadband household penetration rate (there were 1,720,600 households in Ireland using the Central Statistics Office (CSO) Q4 2016 estimate) as of Q4 2016 was 69.6%.

Based on the total number of broadband subscriptions in Ireland for Q4 2016, the broadband per capita penetration rate (including mobile broadband) was 36.4%. When mobile broadband is excluded, the penetration rate was 28.9%.⁶⁵ These figures are based on a population of 4,700,100 from the CSO Q4 2016 estimate⁶⁶.

Figure 3.5.1 shows fixed broadband subscriptions per capita among 25 EU countries in Q3 2014 and Q3 2016⁶⁷. Based on this data, Ireland's fixed broadband per capita penetration rate (28.4%) is less than the benchmarked EU average of 30.8%.

Figure 3.5.1 – Fixed Broadband Subscriptions per Capita



⁶⁵ It should be noted that ComReg reports dedicated mobile broadband subscriptions (i.e. on the basis of mobile dongles/datacards) only. Subscriptions with Internet access over a handset are not included. Therefore, the total number of mobile broadband users (i.e. dedicated mobile broadband and handset subscriptions with internet access) will be higher than stated in this report. On the other hand, a broadband subscriber may have both a fixed and mobile broadband subscription and therefore, a broadband penetration rate based on both mobile and fixed subscriptions may overestimate the penetration rate.

⁶⁶ Estimates based on Quarterly National Household Survey (QNHS).

⁶⁷ Q3 2016 is the latest quarter for which this information is available.

Figure 3.5.2 shows the proportion of households with broadband connections from 2012 to 2016.⁶⁸ Both fixed and mobile broadband⁶⁹ are included. Ireland's household broadband penetration rate, at 86%, is higher than the EU28 average of 83%. Penetration has increased by 23 percentage points since 2012 while the EU28 penetration has increased by 11 percentage points. Figure 3.5.3 overleaf presents broadband penetration rates in Ireland and EU since 2007.

Figure 3.5.2 – Household Broadband Subscriptions, 2012 - 2016

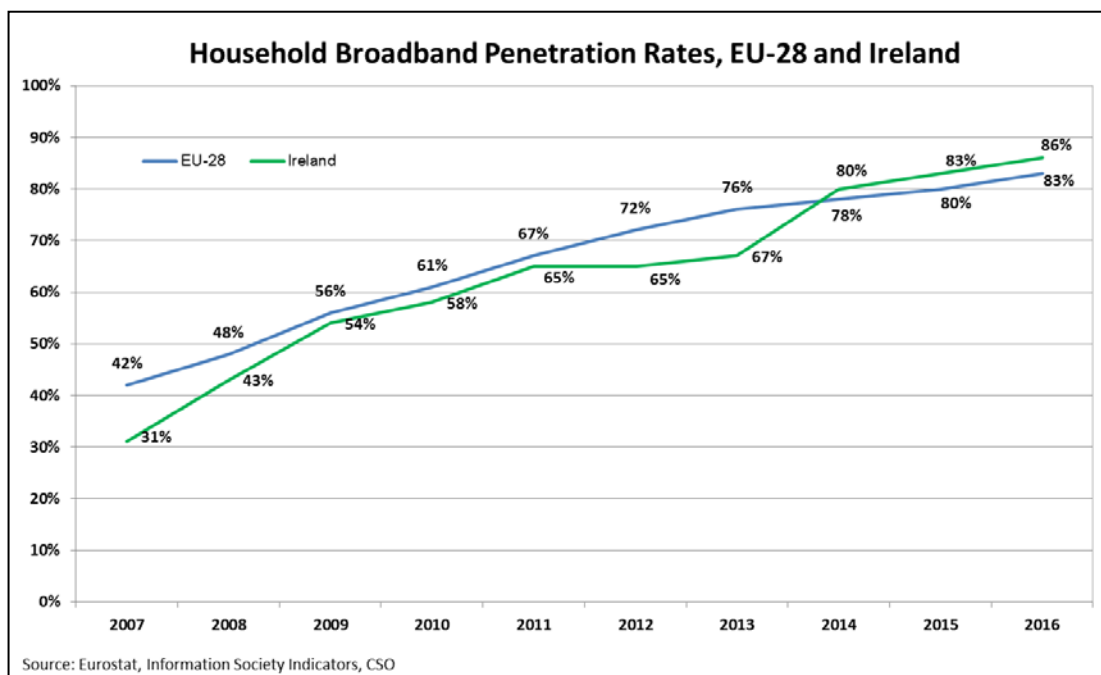
	Broadband Internet Connections		
	2012	2014	2016
Austria	77	79	85
Belgium	75	81	82
Bulgaria	51	56	63
Croatia	60	68	77
Cyprus	62	69	74
Czech Rep.	63	76	80
Denmark	85	85	92
Estonia	73	81	85
EU-28	72	78	83
Finland	85	89	91
France	77	77	79
Germany	82	87	90
Greece	51	65	68
Hungary	66	73	81
Ireland	65	80	86
Italy	55	71	77
Latvia	67	73	75
Lithuania	60	65	71
Luxembourg	68	93	97
Malta	77	80	82
Netherlands	84	94	95
Poland	67	71	76
Portugal	60	63	73
Romania	50	58	70
Slovakia	72	76	78
Slovenia	73	75	78
Spain	65	73	81
Sweden	87	87	89
UK	86	88	92

Source: Eurostat⁷⁰

⁶⁸ Latest available whole-year data.

⁶⁹ Households with at least one member aged 16–74. Broadband connection includes: DSL, VDSL, wired fixed (cable, fibre, Ethernet, PLC), fixed wireless (satellite, Wi-Fi, WiMax) and mobile wireless (3G/4G).

⁷⁰ (online data code [isoc_ci_it_h](#)).

Figure 3.5.3 – Household Broadband Penetration, 2007 - 2016

3.6 Wi-Fi Broadband Access⁷¹

While Wi-Fi originally emerged as an alternative to share broadband connectivity in the home and to provide access to nomadic laptop users in airports and other public places, it is now being used by a broader range of service providers with different business models and services which include in home connectivity, outdoor access for nomadic users, and off-loading and coverage alternatives for mobile operators.

ComReg presents data on the Wi-Fi market based on the number of public Wi-Fi hotspots and access points located nationally. Internet hotspots are typically public wireless access points where a computer, usually a laptop, or other portable device such as an iPhone or tablet can connect to the internet. A Wi-Fi hotspot can be made up of one or more Wi-Fi access points⁷². Wi-Fi hotspots tend to be found in airports, hotel lobbies and cafés and restaurants. In most cases, the user pays for high-speed internet access at an access point, based either on a vouchered payment for a specific amount of time online or a recurring monthly subscription. There are a number of providers of these services in Ireland including Sky Ireland, BT Ireland and Bitbuzz⁷³.

⁷¹ Additional Wi-Fi services information is available from one operator since Q3 2015. Hence, information in Figure 3.6.1 is not directly comparable to information in previous periods.

⁷² Hotspots are typically public locations at which broadband internet access can be obtained. At these hotspots, users with a computer (usually a laptop) can wirelessly connect to the internet either for free or on payment of a fee. Typical locations for such hotspots include cafes and restaurants, hotels and airports. In general terms, more than one access point can be found at a hotspot.

⁷³ Bitbuzz was acquired by Virgin Media.

Comparing Q4 2015 to Q4 2016, the number of Wi-Fi hotspots decreased by 71% and the number of access points has decreased by approximately 47.0%⁷⁴. Wi-Fi minutes decreased by 42.3% over this period.

A breakout of the data by operators' percentage shares in Q3 2016 is also provided below.

Figure 3.6.1 – Wi-Fi Hotspots, Access Points and Minutes of Use

	Q4 2016	Q3'16-Q4'16 Growth	Q4'15-Q4'16 Growth
Wi-Fi Hotspots	1,065	5.7%	-71.0%
Wi-Fi Access Points	3,246	9.5%	-47.0%
Wi-Fi Minutes of Use	562,963,108	-16.7%	-42.3%

	Bitbuzz	BT	OAOS
Wi-Fi Hotspots	55.49%	12.39%	32.12%
Wi-Fi Access Points	82.52%	5.03%	12.45%
Wi-Fi Minutes of Use	73.69%	24.45%	1.86%

3.7 Fixed and Mobile Broadband Pricing Data

ComReg uses independently collated Strategy Analytics (Teligen) pricing data using OECD-approved methodologies to examine the relative prices of a number of specific fixed broadband and mobile broadband usage baskets of national broadband services and broadband services in other selected countries for both residential and business users. The pricing data used for international comparisons includes pricing information for selected countries, namely Germany, Denmark, Spain, Netherlands and the United Kingdom⁷⁵.

⁷⁴ As of Q3 2016 Eir does not provide this service.

⁷⁵ In future Quarterly Key Data Reports ComReg may expand the analysis and include more countries for international price comparisons.

For national comparisons, the prices advertised⁷⁶ by the largest operators (in terms of number of subscribers to fixed broadband services and separately number of subscribers to mobile broadband services) during Q4 2016 were analysed⁷⁷ for selected OECD usage baskets. In this Quarterly Key Data Report, standalone and bundled fixed broadband service prices advertised by Eir, Virgin Media, Vodafone, Sky, Digiweb and Imagine were analysed. For mobile broadband services, prices advertised by the Three Group, Vodafone, Meteor, Eir Mobile, Tesco and iD were analysed. Thus, the broadband pricing analysis does not necessarily present the lowest prices available in the entire market, but rather the lowest prices offered by the operators having the largest number of subscribers. It should also be noted that some of the operators included in the analysis do not offer their services nationally⁷⁸. In addition, some operators only offer broadband services bundled with another service (e.g. fixed voice services which can include line rental, sometimes also with an inclusive amount of call minutes). In these instances, the analysis is based on the cost of the bundle excluding any voice related usage patterns. i.e., only broadband usage related factors are taken into account⁷⁹ in the analysis.

For international comparisons, prices advertised⁸⁰ by the largest operators (in terms of the number of subscribers to fixed broadband services and separately number of subscribers to mobile broadband services) operators in each of the respective countries during Q4 2016 were analysed⁸¹ for selected usage baskets⁸² (with an average per country price presented based on the average of lowest price tariffs advertised by three highest ranking operators in national pricing comparisons). In order to enable international comparisons, prices are presented in Euro Purchasing Power Parities (PPPs) and exclude VAT charges. PPPs provide an indication of the cost of telecoms services in countries analysed in relation to the cost of all other products and services.

The presented analysis accounts for the fact that broadband services differ in terms of advertised download/upload speeds to ensure that a meaningful comparison can be

⁷⁶ The pricing analysis is based on a review of operators' advertised prices in the period Q4 2016.

⁷⁷ The subscribers of these operators jointly account for over 94% of all fixed broadband subscribers and 100% of all mobile broadband subscribers. For fixed broadband, tariffs based on broadband services provided over DSL, Fibre (incl. VDSL), Cable and FWA were analysed. For mobile broadband, tariffs on broadband services provided over 3G and 4G networks were analysed.

⁷⁸ For example, Virgin Media offers fixed broadband services only in the areas where its cable network has been rolled out.

⁷⁹ In other words, the broadband pricing analysis does not take account of fixed voice call usage.

⁸⁰ The pricing analysis is based on a review of operators' advertised prices in the period Q4 2016.

⁸¹ The subscribers of these operators jointly account for over 80% of all fixed broadband subscribers and 80% of all mobile broadband subscribers in each of the respective countries.

⁸² The same basket was applied to each respective country in order to make the international comparison.

made between packages in terms of contracted download speeds offered. Packages which limit usage through speed restrictions when usage exceeds inclusive allowances are excluded. The presented analysis also incorporates discounts offered by operators. Nonrecurring charges (e.g. charges for the installation of a service) are discounted/amortised over three years and other recurring fixed costs such as line rental (in case of fixed broadband) are included and any other additional broadband related charges are included in the baskets.

The OECD basket methodologies are reviewed and revised periodically, with the latest revision made in early 2010⁸³ for fixed broadband baskets and 2012⁸⁴ for mobile broadband baskets. Further information on the composition of the broadband basket can be found in the Explanatory Memorandum which accompanies this report.

The following baskets are presented in this report⁸⁵:

OECD Residential and business fixed and mobile broadband baskets

Type of basket	Basket
Fixed Broadband Residential	18GB basket (broadband speeds ≤ 30 Mbps)
Fixed Broadband Residential	54GB basket (broadband speeds > 30 Mbps)
Fixed Broadband Business	33GB basket
Mobile Broadband Residential	5GB basket
Mobile Broadband Business	10GB basket

These baskets were selected given their closeness to the national broadband usage patterns observed having regard to the data provided by fixed and mobile broadband operators to ComReg for the purpose of the Quarterly Key Data Report (see Figures 3.4.2 and 3.4.3 above for fixed and mobile broadband data usage patterns). ComReg notes that these baskets reflect usage patterns of an average user and do not necessarily reflect prices of tariffs that are geared towards customers having different usage profiles.

⁸³ See <http://www.oecd.org/sti/broadband/48242089.pdf>.

⁸⁴ See <http://dx.doi.org/10.1787/5k92wd5kw0nw-en>.

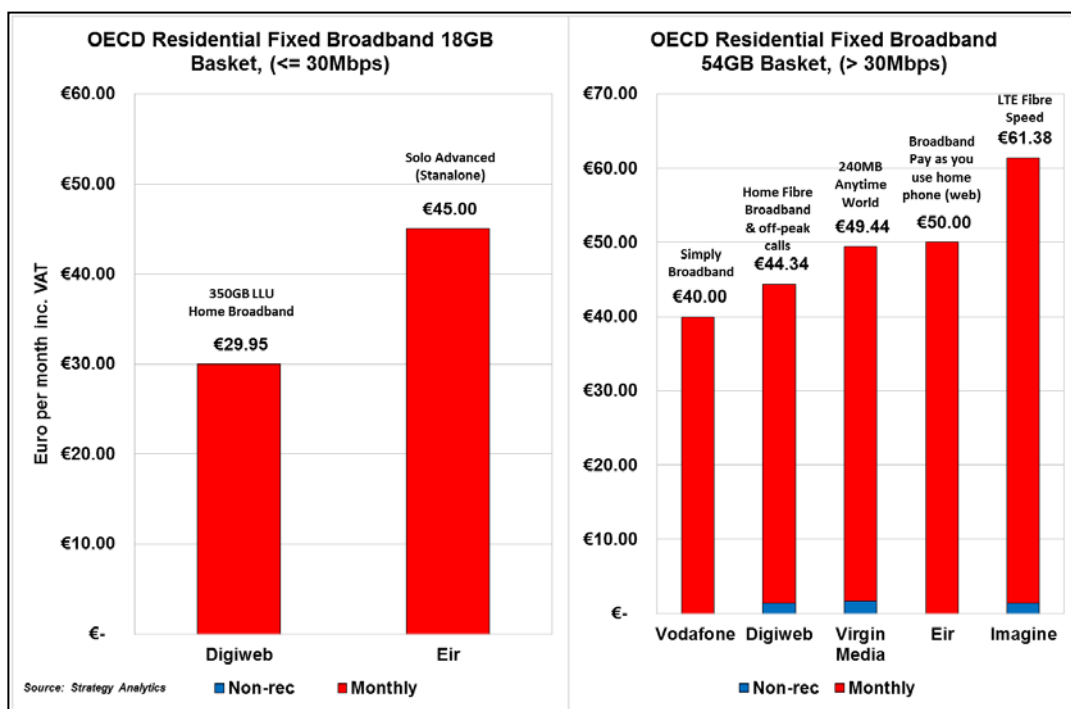
⁸⁵ In future Quarterly Key Data Reports ComReg may expand the analysis and present price comparisons based on additional and/or different usage baskets.

ComReg notes that comparisons are based on the prices of advertised tariffs only⁸⁶ and the analysis does not take into consideration other important factors such as quality of the network, levels of customer care, additional units of consumption available after having accounted in the analysis for the units in the OECD usage basket, minimum contract term etc.

OECD Residential Fixed Broadband Service Basket

Figure 3.7.1 compares the cheapest residential tariffs advertised by fixed broadband providers (whether standalone broadband or broadband sold as part of a bundle) for residential customers based on an OECD 18GB and 54GB monthly data usage baskets. For fixed broadband where the advertised download speed of the broadband service does not exceed 30Mbps, Digiweb offers the cheapest tariff⁸⁷ for this particular usage profile at €29.95 followed by Eir (€45.00). For fixed broadband where the advertised download speed of broadband service exceeds 30Mbps, Vodafone offers the cheapest tariff (€40.00), followed by Digiweb (€44.34) and Virgin Media (€49.44).

Figure 3.7.1 - Residential Fixed Broadband Basket (National)

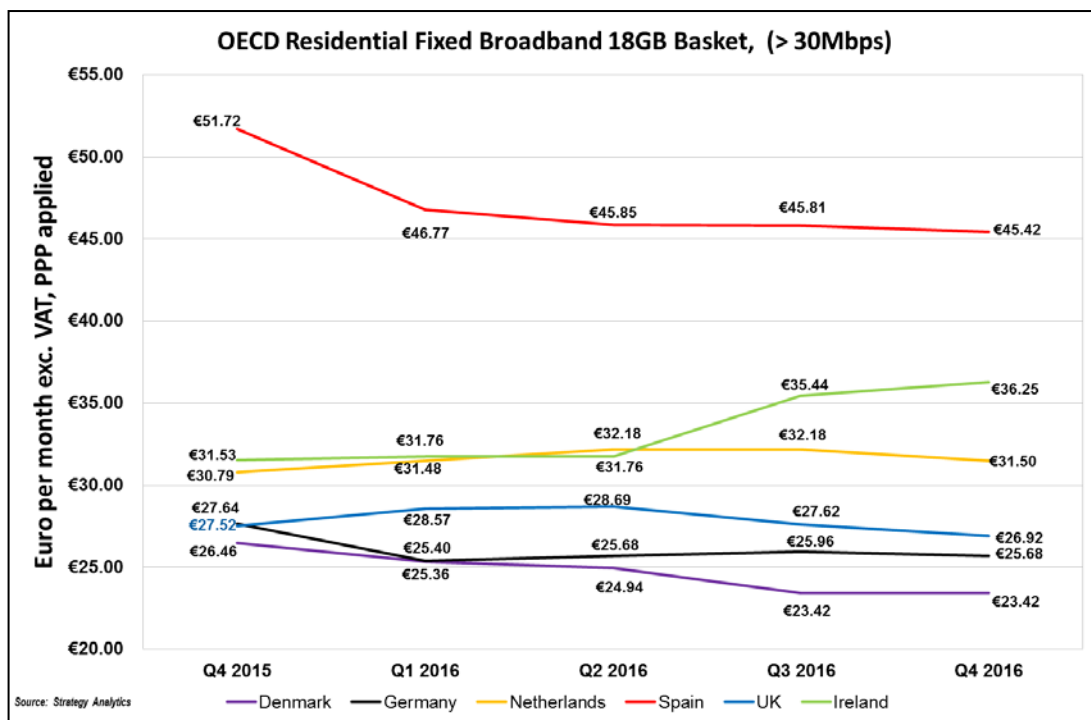


⁸⁶ Tariffs publicly advertised during Q4 2016.

⁸⁷ This tariff is based on Digiweb's fixed wireless access (FWA) broadband service.

Figure 3.7.2 illustrates Ireland's ranking alongside five other Western European countries. Ireland ranks in fifth place with an average price of €36.25⁸⁸ for this particular residential basket. The average price in Ireland is 15.0% more expensive than the average price⁸⁹ for all of the countries included in the analysis.

Figure 3.7.2 - Residential Fixed Broadband Basket (International)



OECD Business Fixed Broadband Service Basket

Figure 3.7.3 compares business tariffs advertised by fixed broadband service providers (whether standalone broadband or broadband sold as part of a bundle) for business customers based on a 33GB monthly data usage basket. Presented prices exclude VAT charges. Digiweb offers the cheapest tariff (€30.36) followed by Eir (€35.48) and Vodafone (€40.00).

⁸⁸ As noted previously, average prices used for international comparisons exclude VAT charges.

⁸⁹ The average of prices presented in Figure 3.7.2.

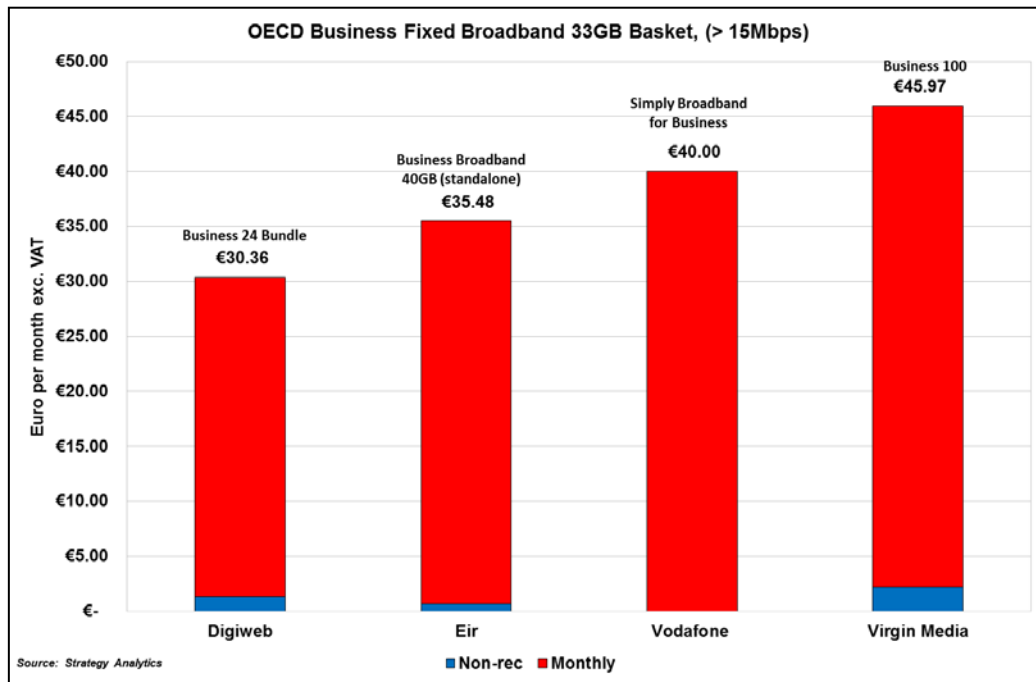
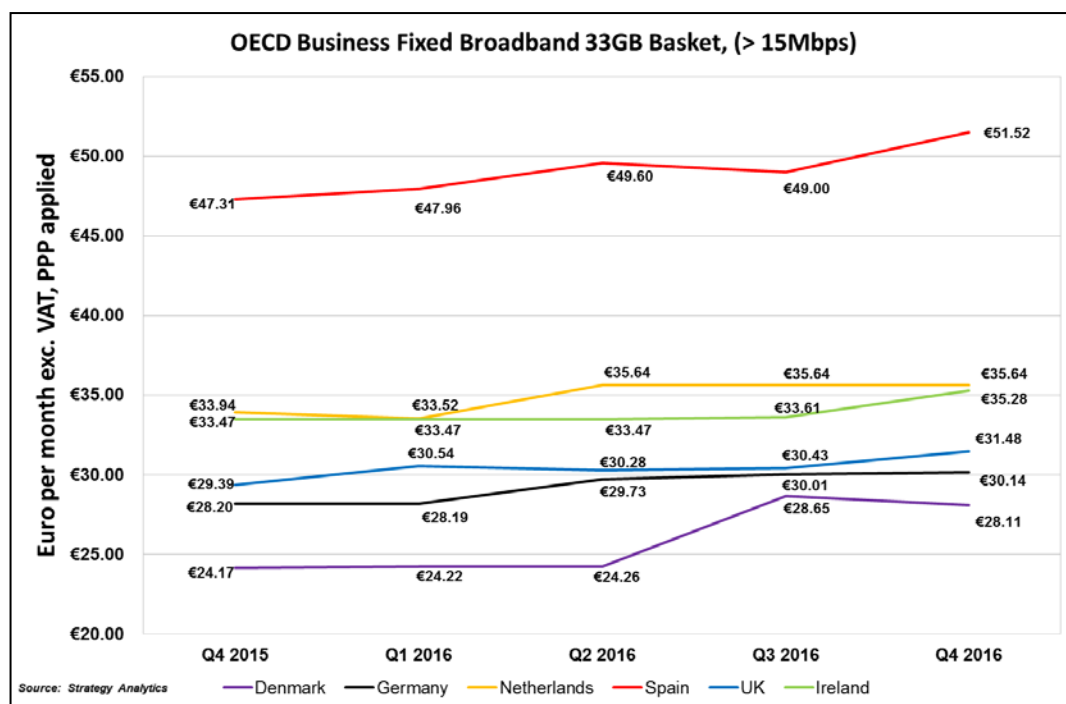
Figure 3.7.3 - Business Fixed Broadband Basket (National)

Figure 3.7.4 shows that in an international comparison context Ireland (€35.28⁹⁰) ranks in fourth place. The average price in Ireland is 0.2% cheaper than the average price⁹¹ for all of the countries included in the analysis.

Figure 3.7.4 - Business Fixed Broadband Basket (International)

⁹⁰ As noted previously, average prices used for international comparisons exclude VAT charges.

⁹¹ The average of prices presented in Figure 3.7.4.

OECD Residential Mobile Broadband Service Basket

Figure 3.7.5 compares pre-paid and post-paid tariffs advertised by mobile broadband service providers for residential customers based on an OECD 5GB monthly mobile data usage basket. Meteor and offers the cheapest tariff (€14.99) followed by iD (€16.92) and Vodafone (€21.11).

Figure 3.7.5 - Residential Mobile Broadband Basket (National)

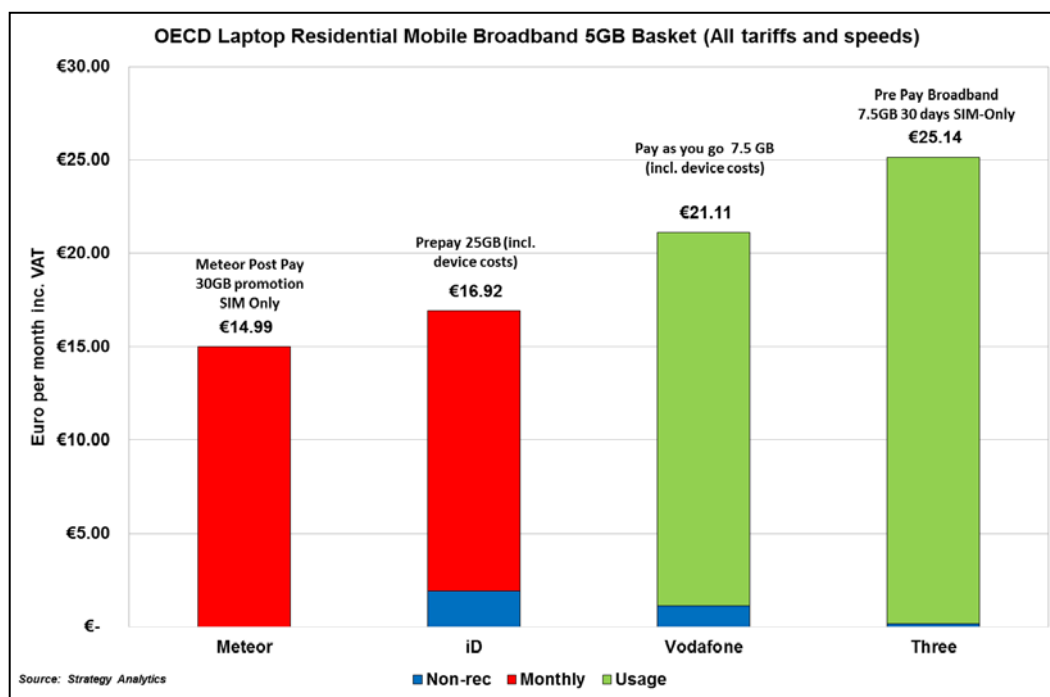


Figure 3.7.6 below illustrates Ireland's ranking alongside five other Western European countries. Ireland ranks in third place with an average price of €14.37⁹² for this particular basket. The average price in Ireland is 26.8% cheaper than the average price⁹³ for all of the countries included in the analysis.

⁹² As noted previously, average prices used for international comparisons exclude VAT charges.

⁹³ The average of prices presented in Figure 3.7.6.

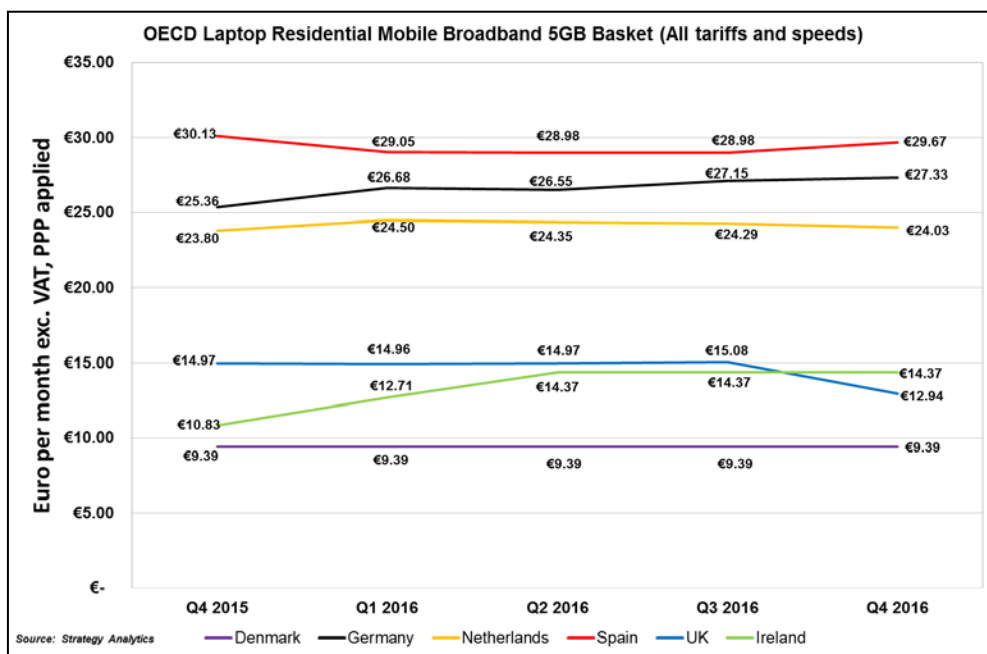
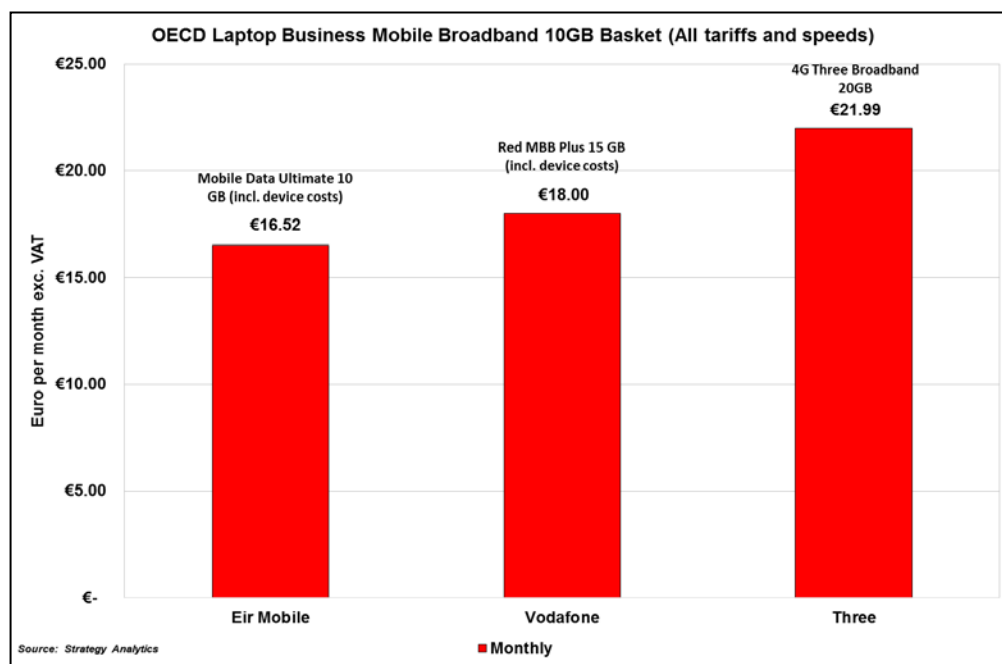
Figure 3.7.6 - Residential Mobile Broadband Basket (International)**OECD Business Mobile Broadband Service Basket**

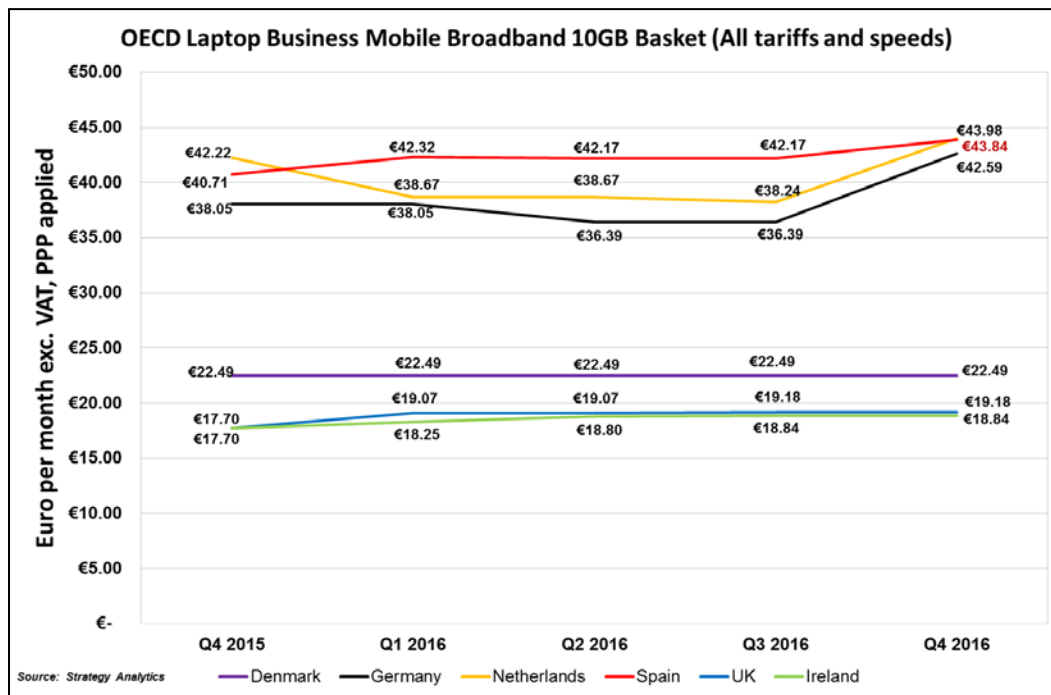
Figure 3.7.7 compares post-paid tariffs advertised by mobile broadband service providers⁹⁴ for business customers based on an OECD 10GB monthly data usage basket. Presented prices exclude VAT charges. Eir Mobile (€16.52) offers the cheapest tariff followed by Vodafone (€18.00) and Three (€21.99).

Figure 3.7.7 - Business Mobile Broadband Basket (National)

⁹⁴ Only tariffs advertised by Vodafone, Three and eir Mobile were analysed for business customers. Some operators do not offer mobile broadband service to business customers.

Figure 3.7.8 shows that, from an international comparison perspective, Ireland (€18.84⁹⁵) ranks in first place. The average price in Ireland is 40.8% cheaper than the average price⁹⁶ for all of the countries included in the analysis.

Figure 3.7.8 - Business Mobile Broadband Basket (International)



⁹⁵ As noted previously, average prices used for international comparisons exclude VAT charges.

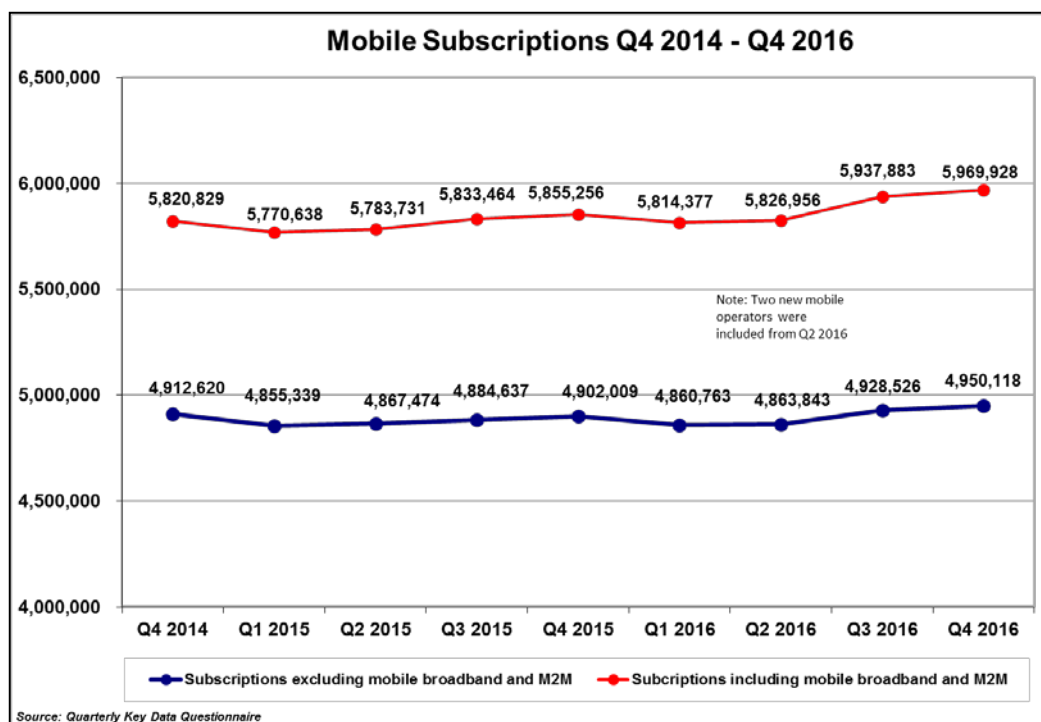
⁹⁶ The average of prices presented in Figure 3.7.8.

4. Mobile Market Data

4.1 Number of Subscriptions and Penetration Rate

At the end of December 2016 there were 5,969,928 mobile subscriptions in Ireland, including mobile broadband and Machine to Machine ('M2M') subscriptions. If mobile broadband subscriptions (349,421) and M2M subscriptions (670,389) are excluded, the total number of mobile subscriptions in Ireland was 4,950,118⁹⁷.

Figure 4.1.1 – Mobile Subscriptions



In Q4 2016 there were 4,340,981 mobile voice and data subscribers using 3G/4G networks in Ireland. This figure can be taken as an indication of the number of smartphone users accessing advanced data services such as web/internet content, online multiplayer gaming content, Video on Demand (VoD) or other equivalent advanced data services (excluding SMS and MMS). This represents approximately 87.7% of all mobile subscriptions (excluding dedicated mobile broadband and M2M) in Q4 2016.

Figure 4.1.2 below shows the breakdown of total active subscribers, total standard mobile voice and data subscribers using 3G/4G networks and dedicated mobile broadband subscribers from Q3 2015 to Q3 2016.

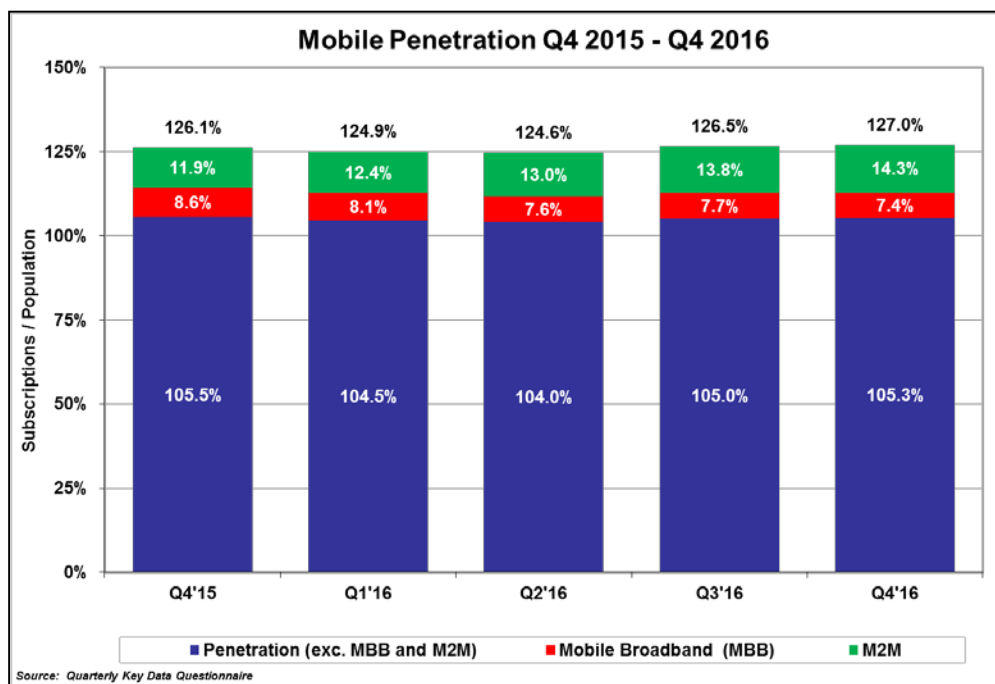
⁹⁷ Mobile voice and mobile broadband subscriptions were revised in Q4 2016. See notes 1 and 2 in the corrigendum of this report.

Figure 4.1.2 – Mobile Subscribers using Data Services over 3G/4G Networks

	Q4 2016	Q4 2015	Quarterly Change Q3'16 – Q4'16	Annual Change Q4'15 – Q4'16
Total active subscriptions	5,969,928	5,855,256	+0.4%	+1.0%
Mobile voice and data subscribers using 3G and 4G networks	4,340,981	4,093,505	+1.8%	+6.0%
Dedicated mobile broadband subscribers	349,421	399,177	-3.3%	-12.5%

Figure 4.1.3 charts mobile penetration since Q4 2015 and shows that at the end of June 2016, mobile penetration, based on a population of 4,700,100 (using CSO Q4 2016 estimate), was 127.0% including mobile broadband and M2M and 105.3% excluding mobile broadband and M2M. Mobile penetration is recognised as the standard metric internationally to measure the adoption of mobile services, and is calculated based on the number of active SIM cards per 100 of the population.

Given that some mobile users may have used more than one active SIM card during the period, there is likely to be some over-estimation of actual individual mobile penetration using this metric. ComReg's calculation of mobile subscriptions includes active SIMs bundled with mobile broadband data cards and USB modems for internet access via laptops/PCs, SIMs that enable the flow of data between Machines as well as SIM cards used in mobile phones for voice and data services.

Figure 4.1.3 – Irish Mobile Penetration Rate

4.2 The Profile of Mobile Subscriptions in Ireland

Mobile users pay for their mobile service by either purchasing pre-paid credit, or by receiving a monthly bill from their mobile operator, described in this report as a post-paid payment option.

Figures 4.2.1 and 4.2.2 illustrate the mobile subscription base (including and excluding mobile broadband and M2M subscriptions) in Ireland classified by the proportion of pre-paid and post-paid subscriptions on 2G, 3G and 4G networks at the end of Q4 2016. Post-paid subscriptions are increasing, accounting for 52.7% of subscriptions in Q4 2016, up from 50.1% one year previously at the expense of a decline in pre-paid subscriptions. If mobile broadband and M2M subscriptions are excluded, post-paid subscriptions account for 44.1% of subscriptions, up from 41.0% in Q4 2015.

Figure 4.2.1 – Profile of Pre-Paid and Post-Paid Subscriptions

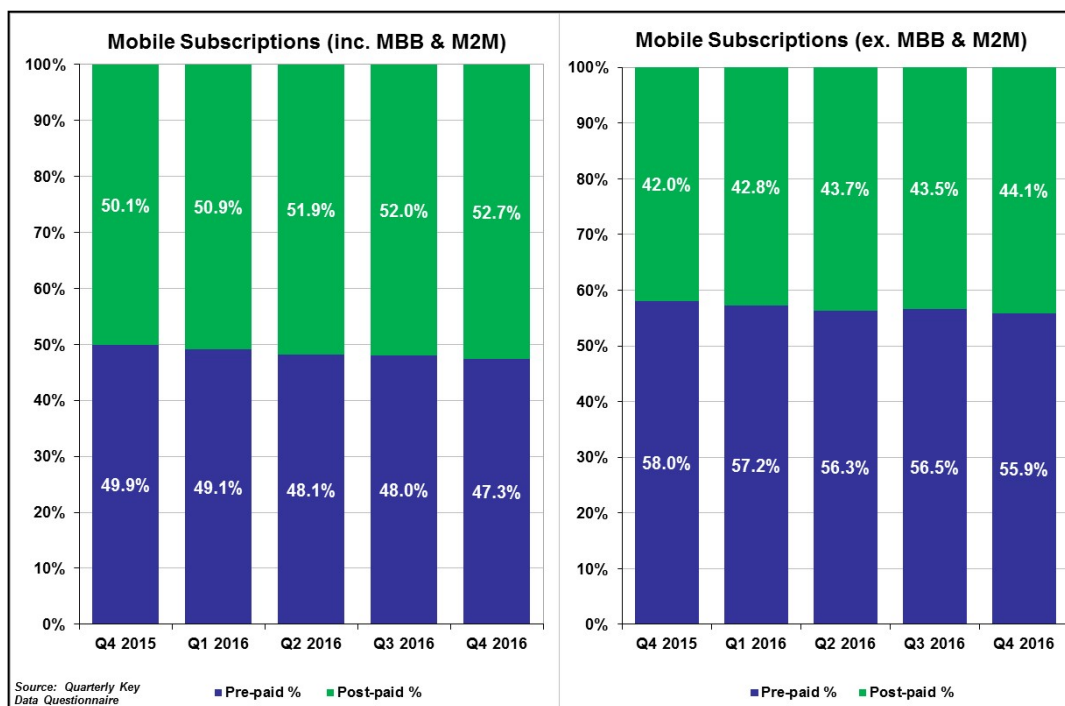


Figure 4.2.2 – Mobile Subscriptions by Pre-pay/Post-pay

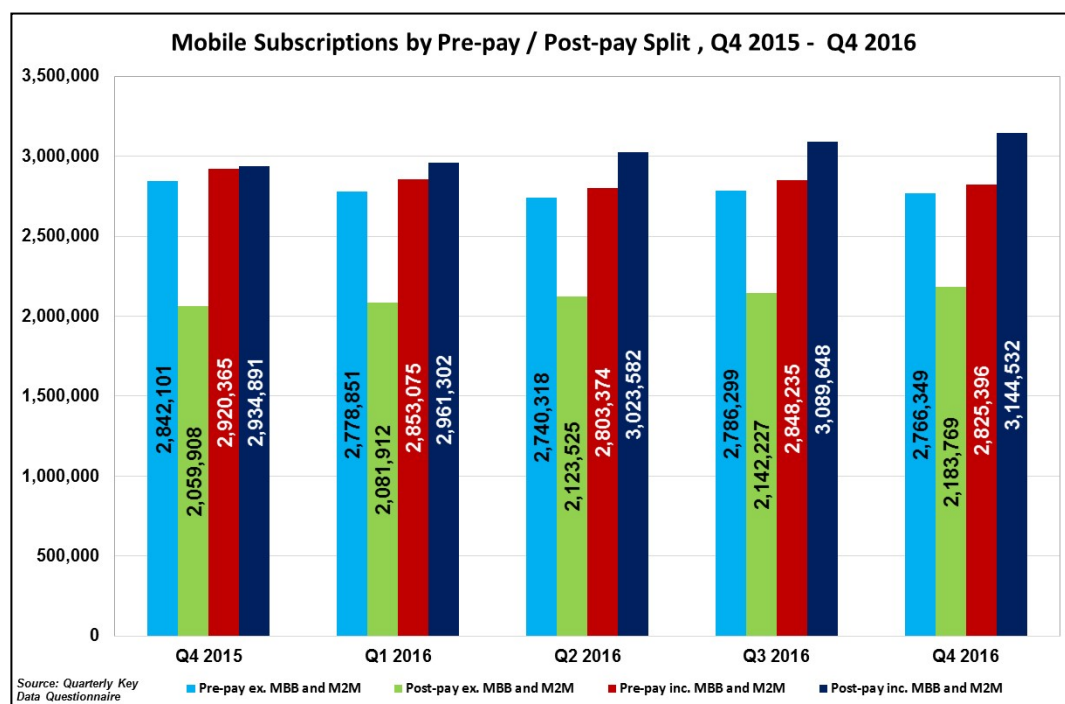


Figure 4.2.3 shows the pre-paid and post-paid subscription profile for each of the mobile operators in the Irish market. Mobile broadband and M2M subscriptions are included. As of Q4 2016, the mobile operator with the highest proportion of post-paid subscriptions was Vodafone (58.6%), followed by Three Group (57.5%), Eir Group Mobile (47.3%) and Tesco Mobile (15.1%). Post-paid subscriptions for OAOs was 23.2%.

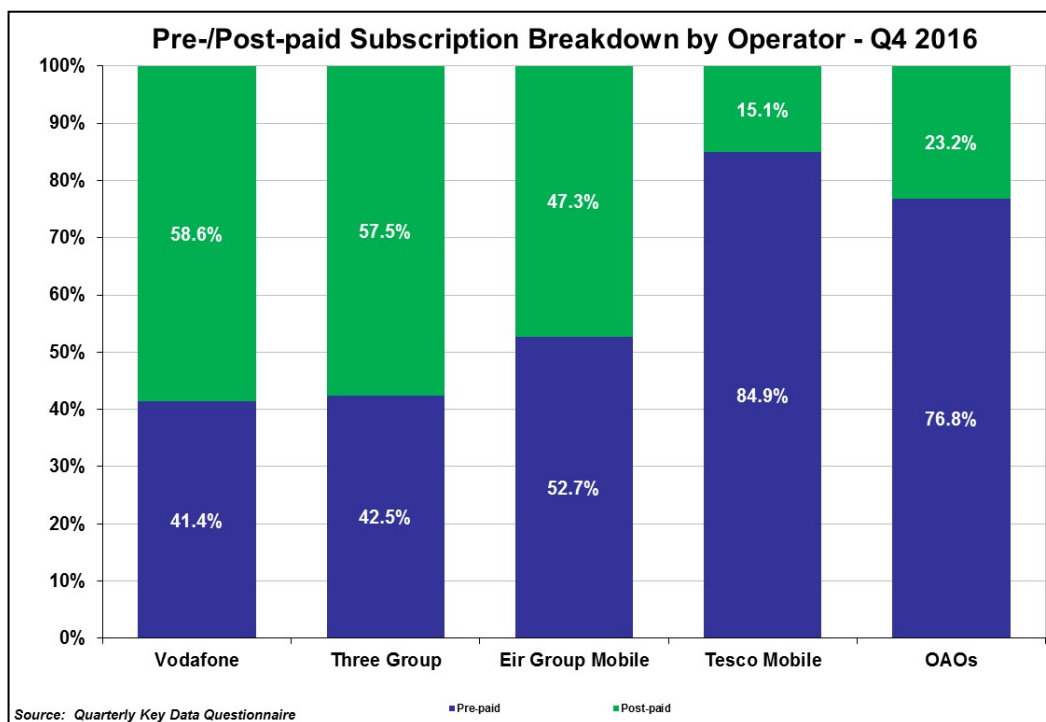
Figure 4.2.3 – Profile of Pre-Paid and Post-Paid Subscriptions by Operator

Figure 4.2.4 shows the split between pre-paid and post-paid mobile broadband subscriptions between Q4 2015 and Q4 2016. 83.1% of all mobile broadband subscriptions were post-paid at the end of December 2016, up from 80.4% one year previously.

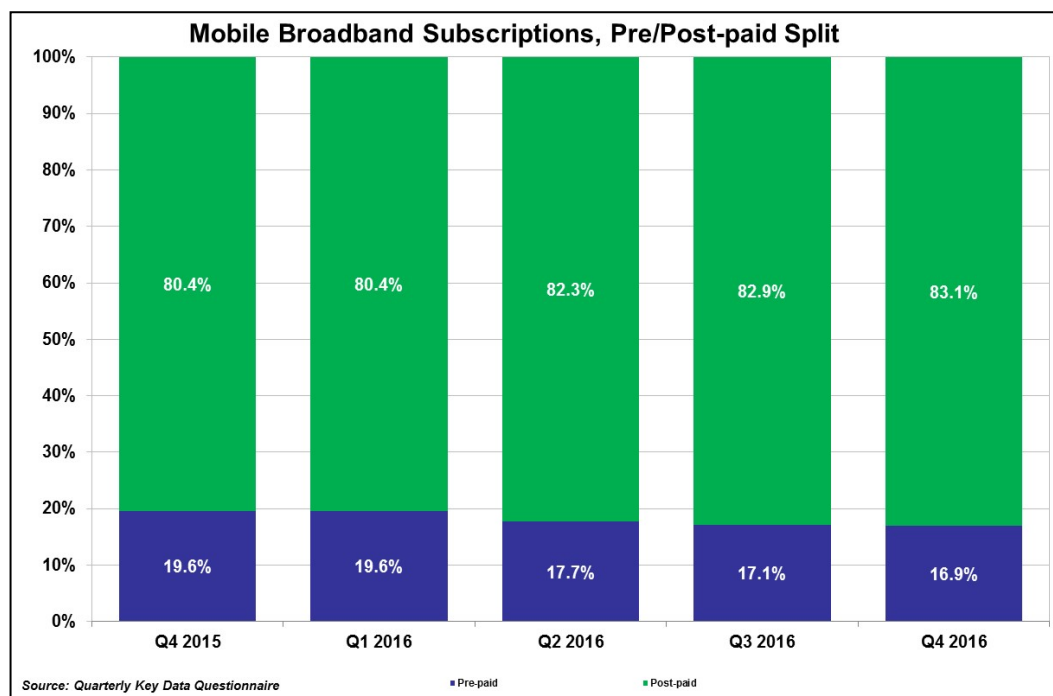
Figure 4.2.4 – Profile of Pre and Post Paid Mobile Broadband Subscriptions

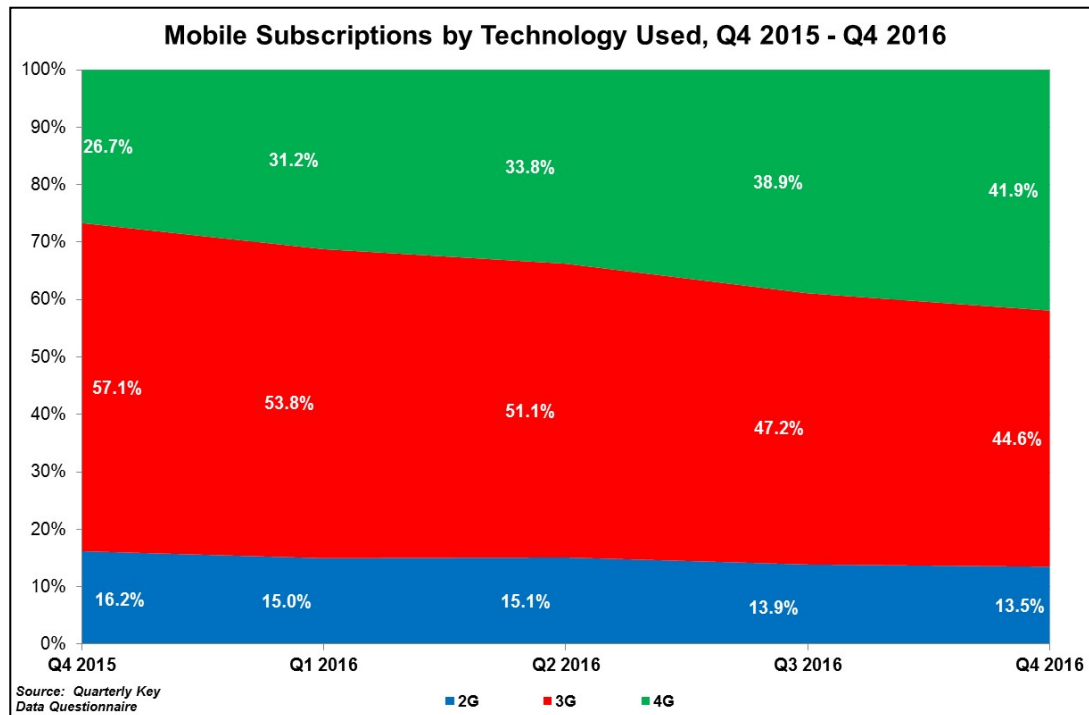
Figure 4.2.5 shows the split of post-paid business and non-business mobile subscriptions including and excluding mobile broadband (MBB) and M2M between Q4 2015 to Q4 2016. Approximately 48.8% of post-paid mobile subscriptions (including mobile broadband and M2M) and 33.7% of post-paid mobile subscriptions (excluding mobile broadband and M2M) were classed as business subscriptions in Q4 2016.

Figure 4.2.5 – Post-Paid Business and Residential Mobile Subscriptions

	Q4 2016	Q3 2016	Q2 2016	Q1 2016	Q4 2015
Residential subs inc. MBB & M2M⁹⁸	1,609,805	1,592,531	1,584,396	1,548,791	1,554,133
Residential subs ex. MBB & M2M	1,448,191	1,420,410	1,409,001	1,366,554	1,352,165
Business subs inc. MBB & M2M	1,534,727	1,497,117	1,439,130	1,412,511	1,380,758
Business subs ex. MBB & M2M	735,578	721,817	714,468	715,358	707,743

Figure 4.2.6 shows the split of mobile subscribers (including mobile broadband and M2M subscribers) broken down by mobile network technology used by these subscribers. For example, subscribers who purchase 4G plans and have generated traffic on a 4G network are categorised as 4G subscribers. Categories are mutually exclusive in that subscribers who have generated traffic on multiple networks (e.g. 2G and 3G) are categorised as users of the higher quality network (3G in this example). By the end of December 2016, 41.9% of mobile subscribers were categorised as 4G network users, 44.6% were using 3G networks with the remaining 13.5% of subscribers using 2G networks only.

⁹⁸ All M2M subscriptions are assumed to be business subscriptions.

Figure 4.2.6 – Mobile Subscriptions by Network Used

4.3 Mobile Volumes

Figure 4.3.1 illustrates the change in voice minutes, SMS, and MMS (Multimedia Messaging Service) messages and 'other data'⁹⁹ volumes (internet uploads and downloads) sent between Q4 2013 and Q4 2016. Total retail mobile voice traffic was 3.126 billion minutes in Q4 2016, an increase of 0.1% on Q4 2015.

The total number of SMS messages sent by mobile users in Ireland was over 1.35 billion in Q4 2016, down 15.7% on Q4 2015 and down by 1.8% since Q3 2016. The number of multimedia messages (MMS) sent was down by 7.0% in the year to Q4 2016. Data usage volumes continue to rise, increasing by 76.4% in the year to Q4 2016 to reach 54,002 terabytes¹⁰⁰.

⁹⁹ Other data volumes means mobile traffic for which customers do and do not have to pay per MB charges and refers to both uploads and downloads. Retail international roaming data downloaded from network subscribers roaming on foreign networks (including EU-28) is also included.

¹⁰⁰ Other data volumes were revised in Q4 2016. See note 3 in the corrigendum of this report.

Figure 4.3.1 – SMS, MMS, Other Data and Call Minute Volumes

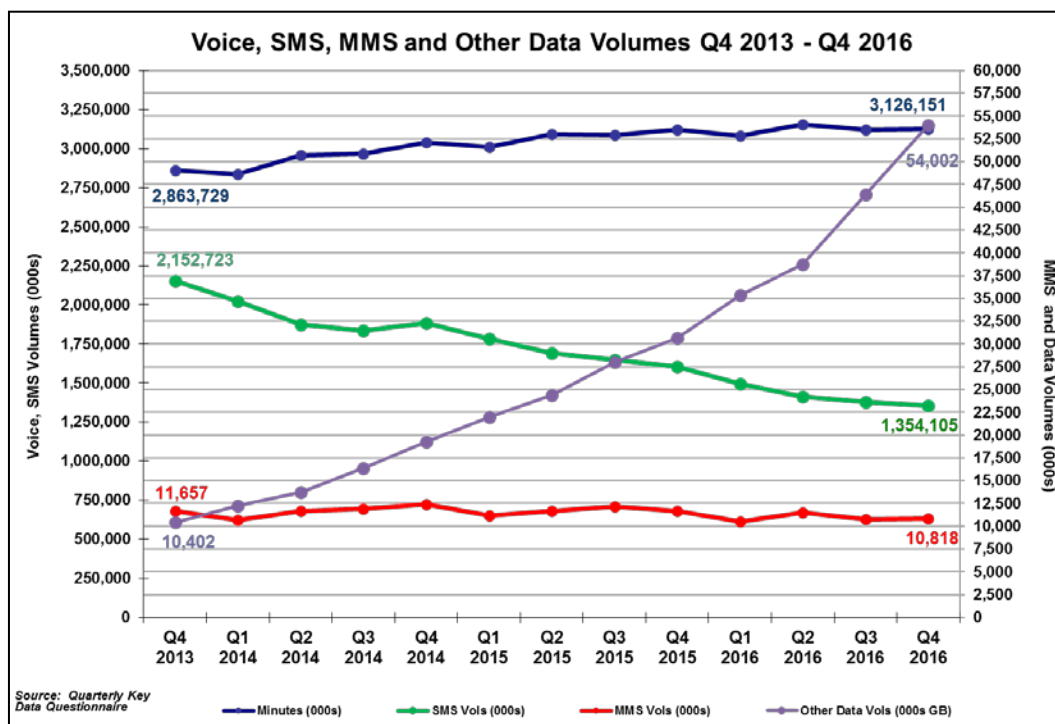


Figure 4.3.2 illustrates the share of types of mobile voice call minutes. As of Q4 2016, 77.1% of all mobile voice minutes were classified as mobile-to-mobile (on-net and off-net), 11.6% of mobile voice minutes were to fixed line phones, 8.6% were classified as international and roaming minutes and the remaining 2.8% were advanced voice minutes which include calls to premium rate services.

Figure 4.3.2 – Voice Call Minute Volumes by Type

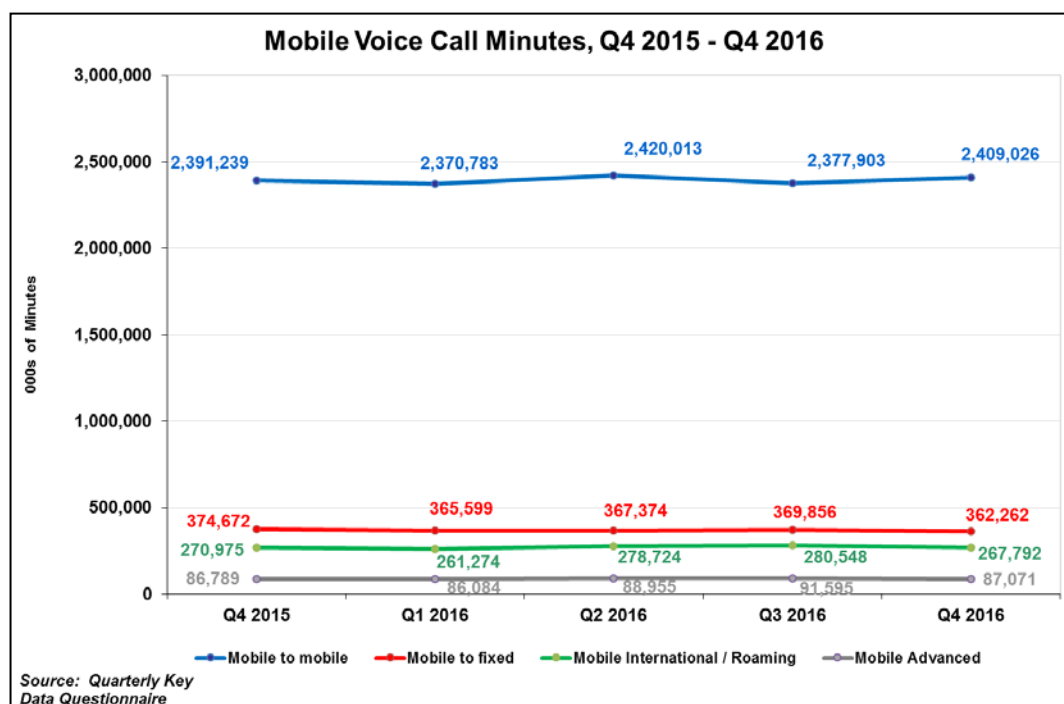


Figure 4.3.3 shows the change in the on-net and off-net mobile to mobile voice call minutes since Q4 2015. During Q4 2016, 57.1% of all mobile to mobile voice minutes were classified as on-net, down from 59.4% in Q4 2015.

Figure 4.3.3 – Mobile to Mobile Voice Call Minute Volumes by Type

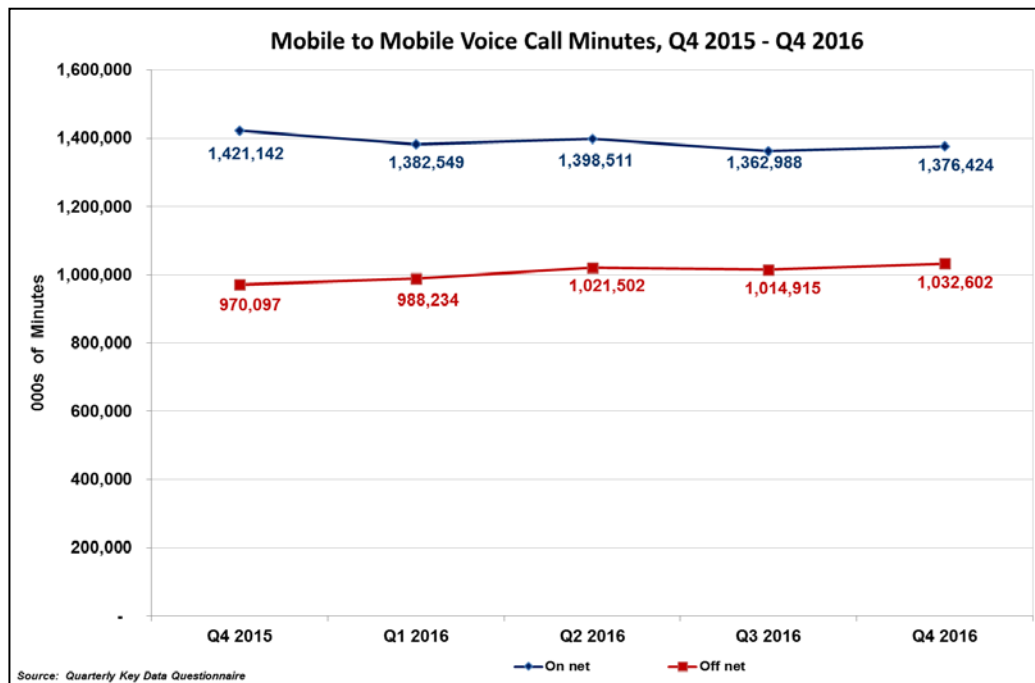


Figure 4.3.4 shows the change in the monthly mobile voice call minutes per subscription. In Q4 2016 the average usage was 210.5 minutes (down by 0.9% since Q4 2015).

Figure 4.3.4 – Monthly Mobile Voice Call Minutes per Subscription by Type

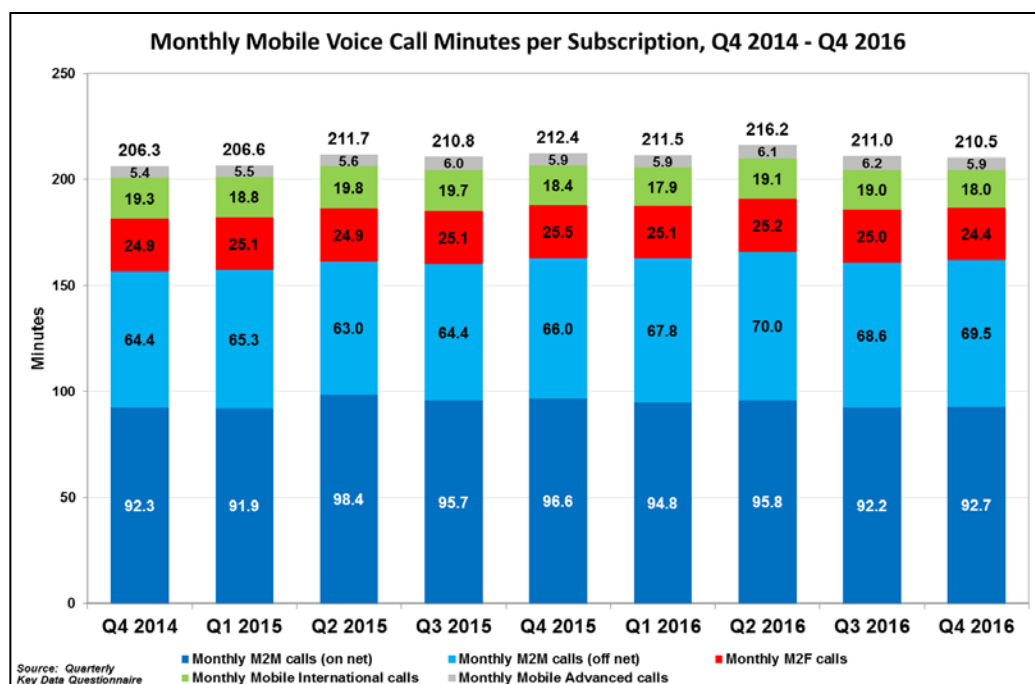


Figure 4.3.5 shows the change in the monthly mobile data volumes per subscription¹⁰¹. In Q4 2016 the average monthly number of SMS/MMS sent was 92 and the average traffic per smartphone¹⁰² reached 3.4 GB of data, while the average traffic per dedicated mobile broadband subscriber was 9.3 GB of data¹⁰³.

Figure 4.3.5 – Monthly Mobile Messaging and Data Volumes per Subscription

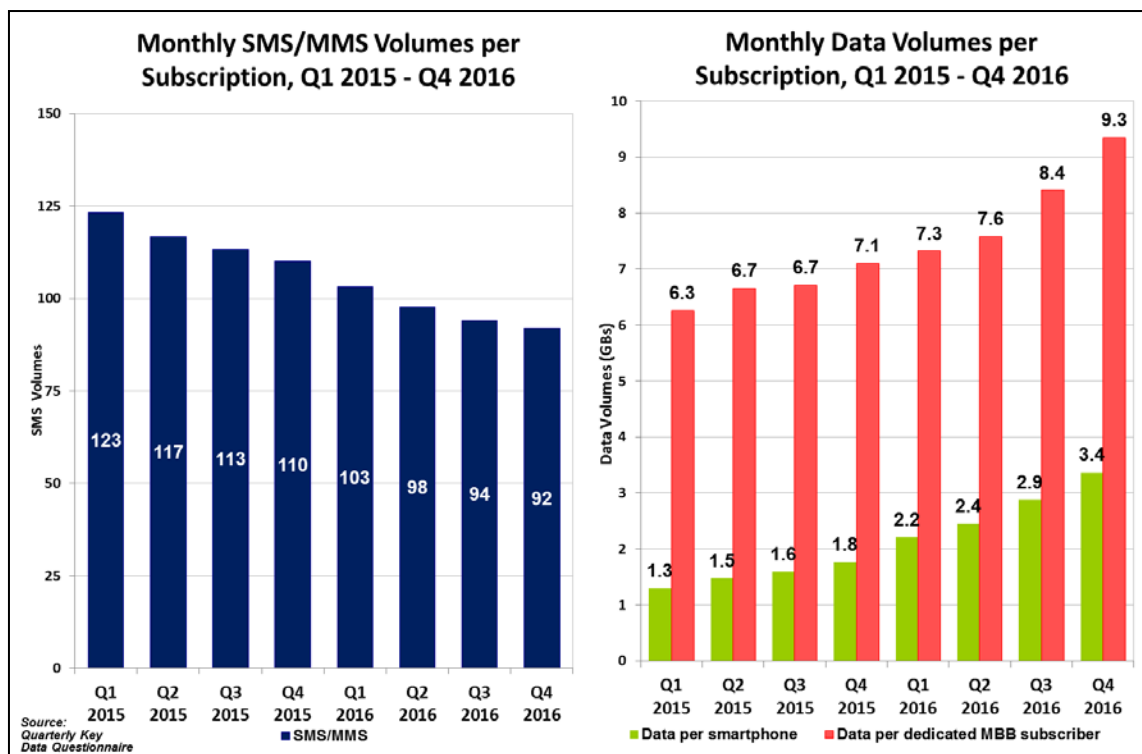


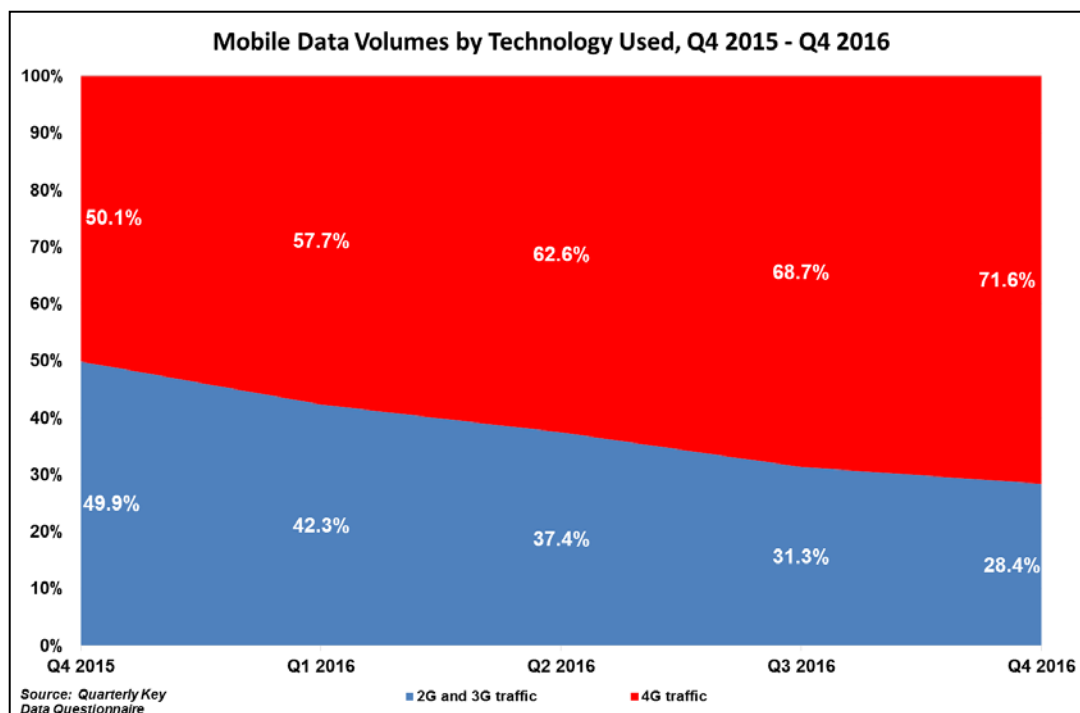
Figure 4.3.6 provides the breakdown of mobile data volumes by mobile network technology. Of all mobile data from Q4 2016 38,663 terabytes or 71.6% was generated on 4G networks, up from 50.1% in Q4 2015¹⁰⁴.

¹⁰¹ Mobile data volumes in Figure 4.3.5 were amended due to revisions. See note 3 in the corrigendum of this report.

¹⁰² Based on the number of standard mobile voice and data subscribers using 3G and 4G networks.

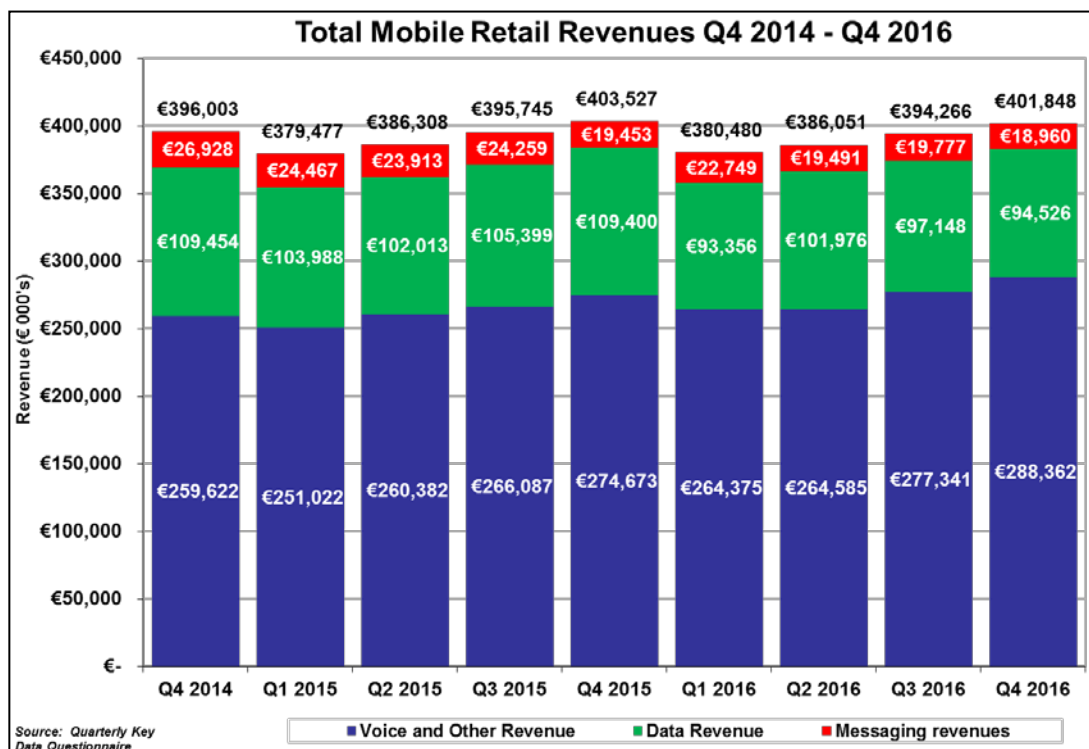
¹⁰³ Data traffic refers to both uploads and downloads.

¹⁰⁴ Mobile data volumes proportions for 3G and 4G in Figure 4.3.6 were amended due to revisions. See note 3 in the corrigendum of this report.

Figure 4.3.6 – Mobile Data Volumes by Technology

4.4 Mobile Revenues

Figure 4.4.1 shows that mobile retail revenues for Q4 2016 were over €401 million. Messaging revenues decreased by 4.1% this quarter, data revenues decreased by 2.7% while voice and other revenues increased by 4.0% since Q3 2016.

Figure 4.4.1 – Total Mobile Retail Revenues

Wholesale mobile revenues were over €49 million in Q4 2016 (a decrease of 25.6% since Q3 2016), the vast majority accounted for by terminating traffic, followed by roaming¹⁰⁵ and access¹⁰⁶ revenues.

4.5 Average Monthly Revenue per User

Mobile ARPU is a function of both the price of mobile services and the level of usage of mobile services. In Q4 2016 mobile ARPU was €23.01 per month, down from €24.32 per month in the previous quarter and down from €24.62 per month in the period Q4 2015.

This overall decline over this period is in line with a general downward trend in ARPU across Western European countries. Based on data from Analysys Mason's Telecom Matrix monthly mobile ARPU across the average of 14 Western European countries fell by 2.4% in Q3 2016¹⁰⁷ compared to Q3 2015.

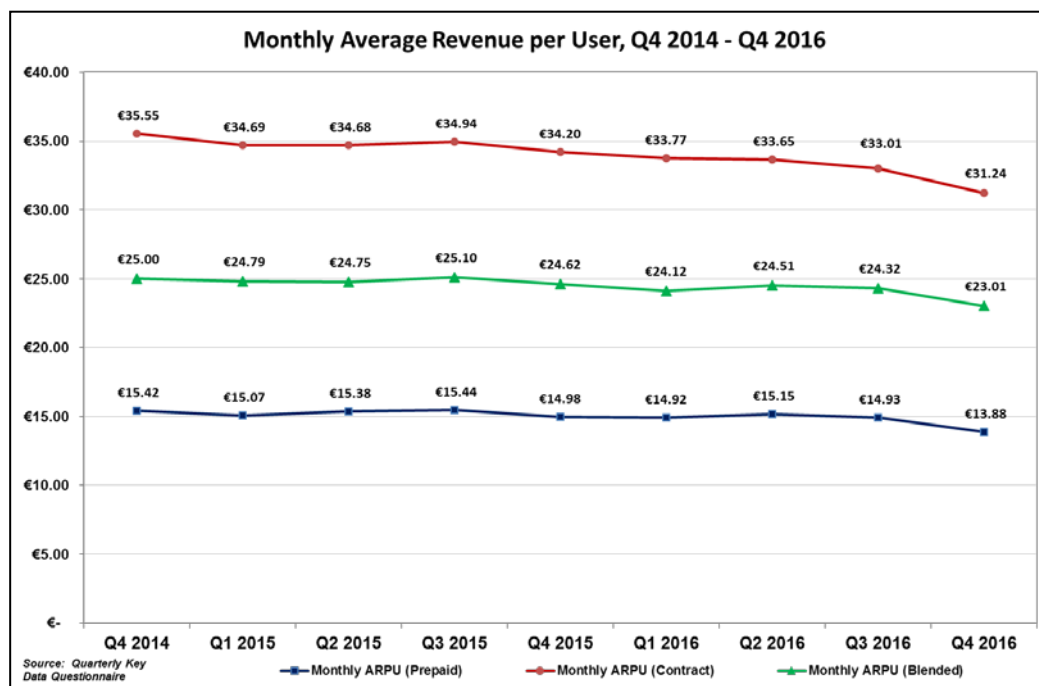
Figure 4.5.1 illustrates the change in ARPU for prepaid and post-paid subscribers. In Q4 2016 mobile ARPU for prepaid subscribers was €13.88 per month while mobile ARPU for post paid subscribers was €31.24 per month.

The general decline in ARPU is likely to be a reflection of a number of factors such as those attributable to increased sales of bundled products (combining mobile with fixed calls and sometimes broadband and/or TV) and, more recently, reductions in roaming and mobile termination rates, among others.

¹⁰⁵ Revenues from the provision of wholesale roaming (inbound) services (voice/text/data services). Excludes revenues from the provision of wholesale roaming (outbound) services to hosted MVNOs.

¹⁰⁶ Includes revenues from the wholesale provision of voice, messaging and data services to MVNOs and access revenues not related to traffic. Includes revenues from the provision of wholesale roaming (outbound) services (voice/text/data services) to hosted MVNOs. Includes revenues from wholesale provision of voice, messaging and data services based on national roaming agreements.

¹⁰⁷ Q3 2016 is the latest quarter for which this information is available.

Figure 4.5.1 – Monthly Average Revenue per User by Type

4.6 Machine to Machine Subscriptions

Machine to Machine (M2M) refers to technologies that involve data communication between devices or systems in which, at least in principle, human intervention does not occur. These technologies may encompass either wireless or wired communications, or both. M2M communication is already widely deployed in Ireland and its usage is set to grow rapidly, driven in no small part by the expansion of next generation telecommunications technology and a decline in the cost of the embedded wireless modules and sensors that enable M2M services. This continued improvement in the infrastructural environment around M2M has led to a rapid growth of applications and services that meet users' business and lifestyle needs. M2M technologies transfer data on the condition of physical assets and devices to a central location (which is distantly located the devices) for effective monitoring and control. M2M has a multitude of uses, with current deployments in the healthcare, energy, home automation and transportation sectors. Specific examples of M2M applications include smart metering, vehicle and consignment tracking and alarm monitoring systems of various kinds, ATM machines signalling the need for cash replacement, smart grid monitoring of real time electricity demand, smart home applications such as switching on and off lights, heating and other appliances.

Different networking technologies can be used to connect M2M devices, depending on the amount of mobility needed, quality required, data rate, the degree of dispersion of

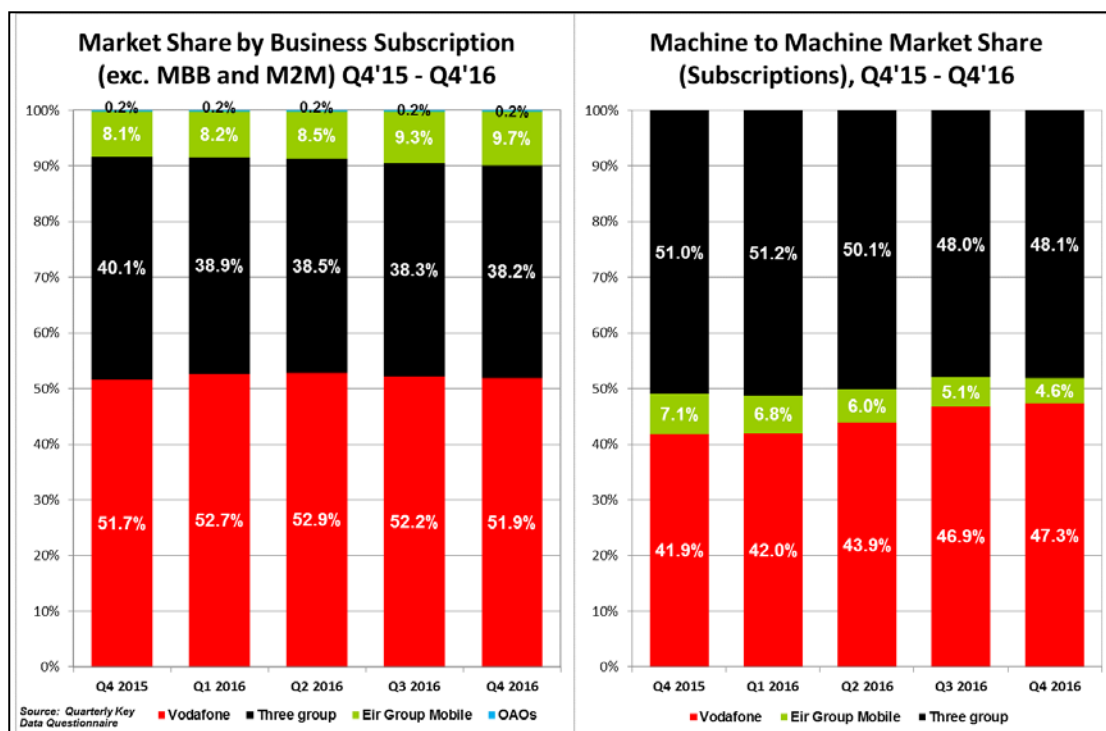
devices over an area, and so on. Gathering data on dedicated M2M mobile connections assists ComReg in assessing future regulatory needs for M2M, e.g. for numbering resources. The additional data also allows for more accurate assessment of mobile telephony and broadband connections.

There were 670,389 M2M subscriptions at the end of December 2016. This is an increase of 21.0% since Q4 2015. Figure 4.6.1 outlines market shares based on active M2M subscriptions as well as market shares in terms of business subscribers (including mobile broadband and M2M subscriptions).

In Q4 2016 Three Group had the largest market share of M2M subscriptions at 48.0% followed by Vodafone with 46.9% of market share. Eir Group Mobile had the remaining 5.1% of M2M subscriptions.

Vodafone had the largest market share in terms of business subscriptions¹⁰⁸ (51.1%) followed by Three Group (39.2%) and Eir Group Mobile (9.5%). OAOs accounted for the remaining 0.2%.

Figure 4.6.1 – Market Share – Business and M2M Subscriptions



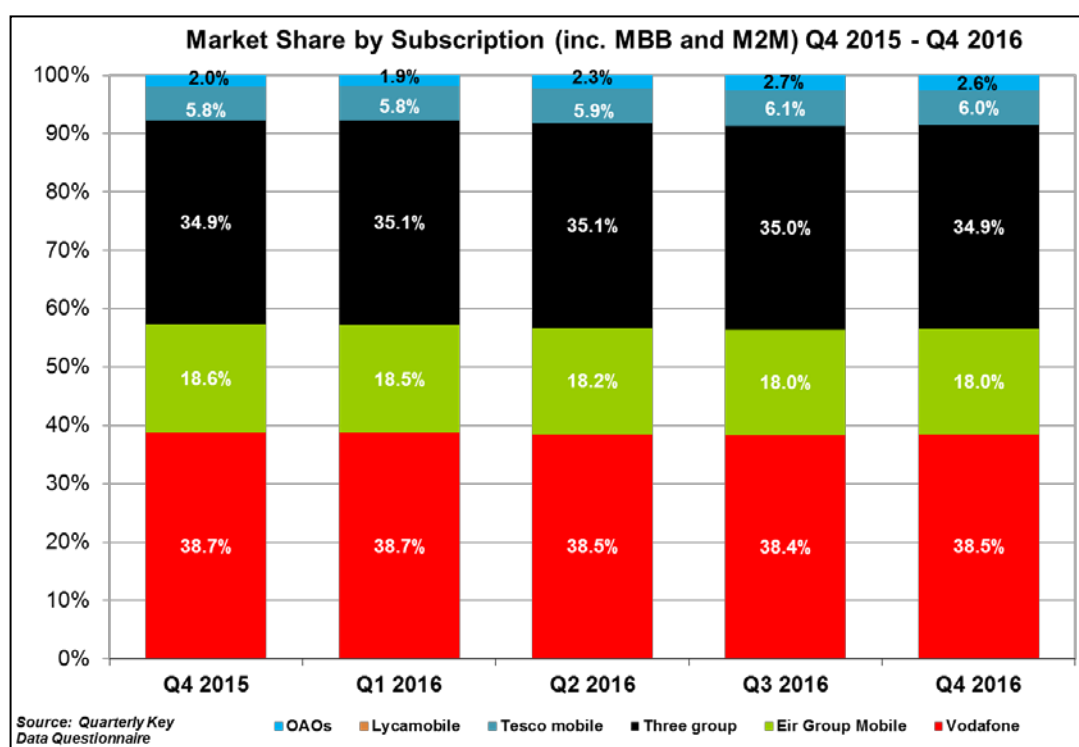
¹⁰⁸ Business subscriptions excluding M2M and business mobile broadband subscriptions.

4.7 Competition in the Mobile Market

Figures 4.7.1 and 4.7.2 outline mobile market shares based on the number of active subscriptions reported by each operator.

Figure 4.7.1 includes mobile broadband and M2M while figure 4.7.2 excludes mobile broadband and M2M. Vodafone has the highest market share including and excluding mobile broadband and M2M (38.5% and 37.0%), followed by Three Group (34.9% and 32.5%), Eir Group Mobile (18.0% and 20.3%) and Tesco Mobile (6.0% and 7.2%). OAOs have market shares of 2.6% and 3.1% respectively.

Figure 4.7.1 – Market Share – Number of Subscriptions (inc. mobile broadband and M2M)¹⁰⁹



¹⁰⁹ As of Q2 2014 O2 is included under Three Group umbrella. For more details see note on page 9 of this report.

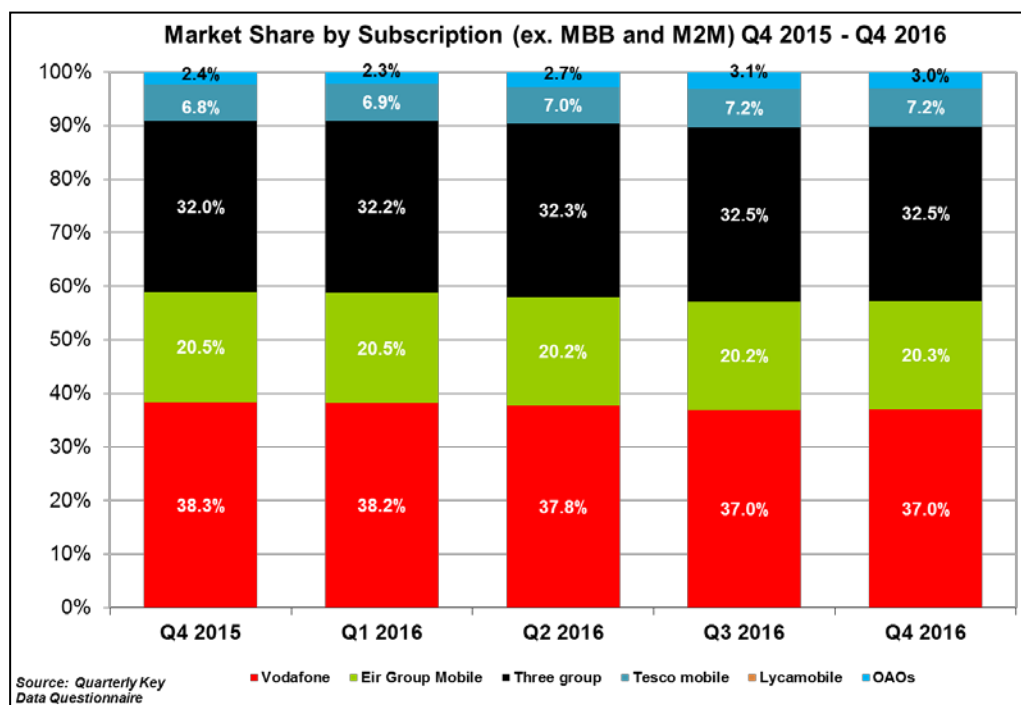
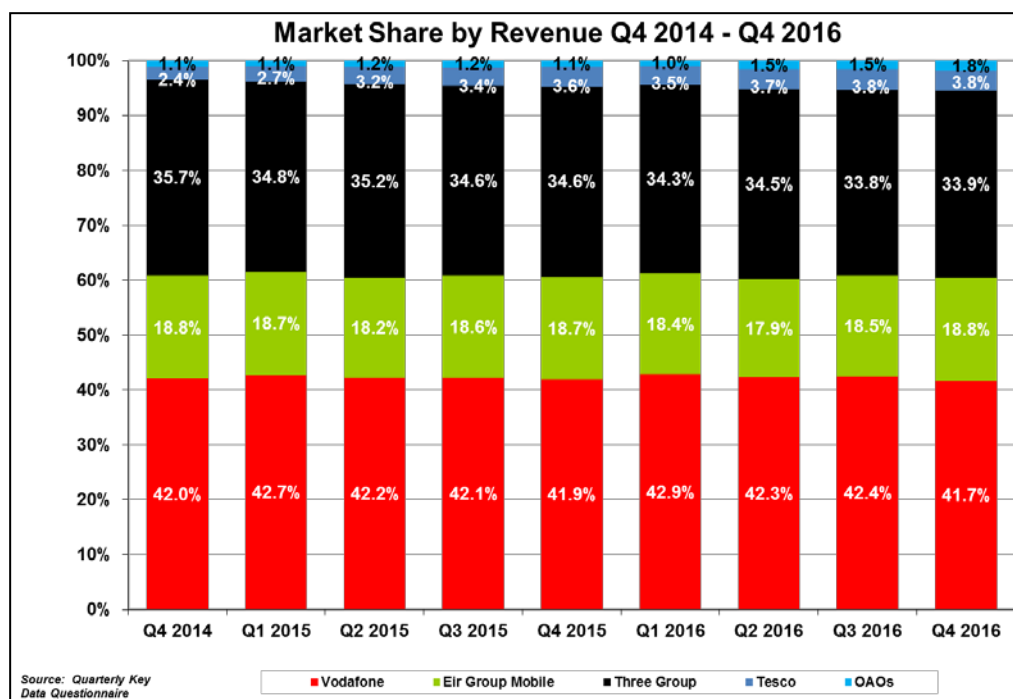
Figure 4.7.2 – Market Share – Number of Subscriptions (ex. mobile broadband and M2M)

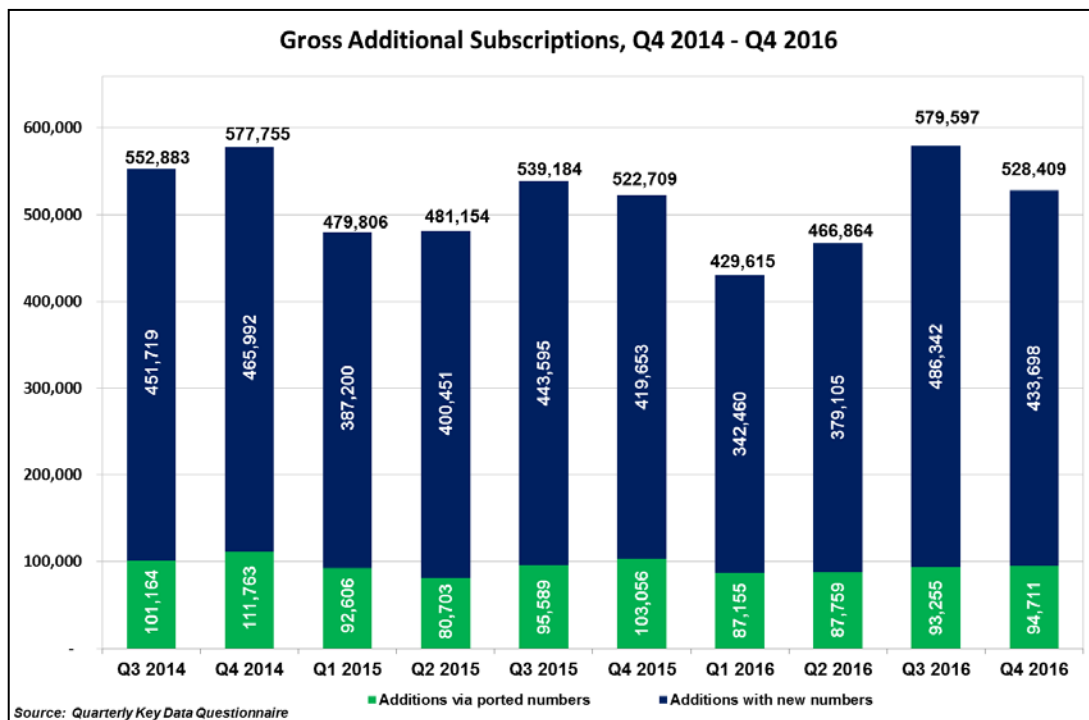
Figure 4.7.3 shows market shares by total retail revenues for mobile operators. Vodafone's market share remains highest at 41.7% followed by Three Group at 33.9%. Eir Group Mobile's market share is the next largest at 18.8% followed by Tesco and OAOs at 3.8% and 1.8% respectively.

Figure 4.7.3 –Market Share by Revenue

4.8 Switching in the Mobile Market

Figure 4.8.1 illustrates the number of subscribers who port their numbers as a proportion of total gross additions¹¹⁰. There were 528,409 gross additional subscriptions in Q4 2016. In the quarter to December 2016, 94,711 numbers were ported between mobile operators with a total of 362,880 numbers having been ported over a twelve month period. Gross additions via ported numbers accounted for 17.9% of total gross additions in Q4 2016.

Figure 4.8.1 – Gross Subscription Additions and Numbers Ported



4.9 Mobile Pricing Data

ComReg uses independently collated Strategy Analytics (Teligen) pricing data using OECD-approved methodologies to examine the relative prices of a number of specific mobile phone usage baskets of national and international telecoms services for both residential and business users. The pricing data used for international comparisons includes pricing information for selected countries, namely Germany, Denmark, Spain, Netherlands and the United Kingdom¹¹¹.

¹¹⁰ Gross additions include consumers who decide to avail of multiple SIMs and thus, slightly overstate the switching intensity in Ireland.

¹¹¹ In future Quarterly Key Data Reports ComReg may expand the analysis and include more countries for international price comparisons.

For national comparisons, the prices advertised¹¹² by the largest operators (in terms of the number of subscribers to mobile voice services) during Q4 2016 were analysed¹¹³ for selected usage baskets. In this Quarterly Key Data Report prices advertised by Three, Vodafone, Meteor, Eir Mobile, Tesco, Lycamobile, iD, Virgin Media and 48 were analysed. Thus, the analysis does not necessarily present the cheapest tariffs available in the whole market, but rather the lowest cost tariffs offered by the largest operators.

For international comparisons, the prices advertised¹¹⁴ by largest operators (in terms of the number of subscribers to mobile voice services) in each of the respective countries during Q4 2016 were analysed¹¹⁵ for selected OECD mobile phone usage baskets¹¹⁶ (with an average per country price presented based on the average of lowest price tariffs advertised by three highest ranking operators in national pricing comparisons). In order to enable international comparisons, prices are presented in Euro Purchasing Power Parities (PPPs) and exclude VAT charges. PPPs provide an indication of the cost of telecoms services in countries analysed in relation to the cost of all other products and services.

The presented analysis incorporates discounts offered by operators. Nonrecurring charges (e.g. charges for the activation of a service) are discounted/amortised over three years. Calls to mobile (on-net and off-net) and fixed phones are included in the baskets.

The OECD basket methodologies are reviewed and revised periodically, with the latest revision made in 2012¹¹⁷. Further information on the composition of the broadband basket can be found in the Explanatory Memorandum which accompanies this report.

The following baskets are presented in this report¹¹⁸:

¹¹² The pricing analysis is based on a review of operators' advertised prices in the period Q4 2016.

¹¹³ The subscribers of these operators jointly account for over 99% of all mobile voice subscribers. 4G tariffs were included in the analysis.

¹¹⁴ The pricing analysis is based on a review of operators' advertised prices in the period Q4 2016.

¹¹⁵ The subscribers of these operators jointly account for over 80% of all mobile voice subscribers in each of the respective countries.

¹¹⁶ The same basket was applied to each respective country in order to make the international comparison.

¹¹⁷ See <http://dx.doi.org/10.1787/5k92wd5kw0nw-en>.

¹¹⁸ In the future reports ComReg may expand the analysis and present price comparisons based on additional and/or different usage baskets.

Residential and business mobile phone usage baskets

Type of basket	Basket
Prepaid Residential	30 calls (50 minutes), 100 SMS, 0.1GB data basket
Postpaid Residential	100 calls (182 minutes), 140 SMS and 2GB data basket
Business	300 calls (569 minutes), 225 SMS and 1GB data basket

These baskets were selected given they most closely related to the mobile voice usage patterns presented in figures 4.3.4 and 4.3.5 above. ComReg notes that these baskets reflect usage patterns of an average user and do not necessarily reflect prices of tariffs that are geared towards customers having different usage profiles.

ComReg notes that comparisons are based on the prices of advertised tariffs only and the analysis does not take into consideration other important factors such as quality of the network, levels of customer care, additional units of consumption available after having accounted in the analysis for the units in the OECD usage basket, minimum contract term etc.

OECD Pre-Paid Residential Mobile Basket¹¹⁹

Figure 4.9.1 compares pre-paid tariffs advertised by mobile phone services providers for residential customers based on a basket of 30 calls (50 minutes), 100 SMS and 100 MB data usage. Lycamobile (€9.00) offers the cheapest tariff for this particular OECD basket, followed by 48 (€10.00) and iD (€15.00).

¹¹⁹ ComReg notes that for pre-paid tariffs requiring periodic mandatory top ups (e.g. mandatory monthly (30 day) top ups), the full cost of the top up would be taken into consideration when estimating the total cost of these tariffs.

Figure 4.9.1 – Residential Pre-paid Mobile Phone Services Basket (National)¹²⁰

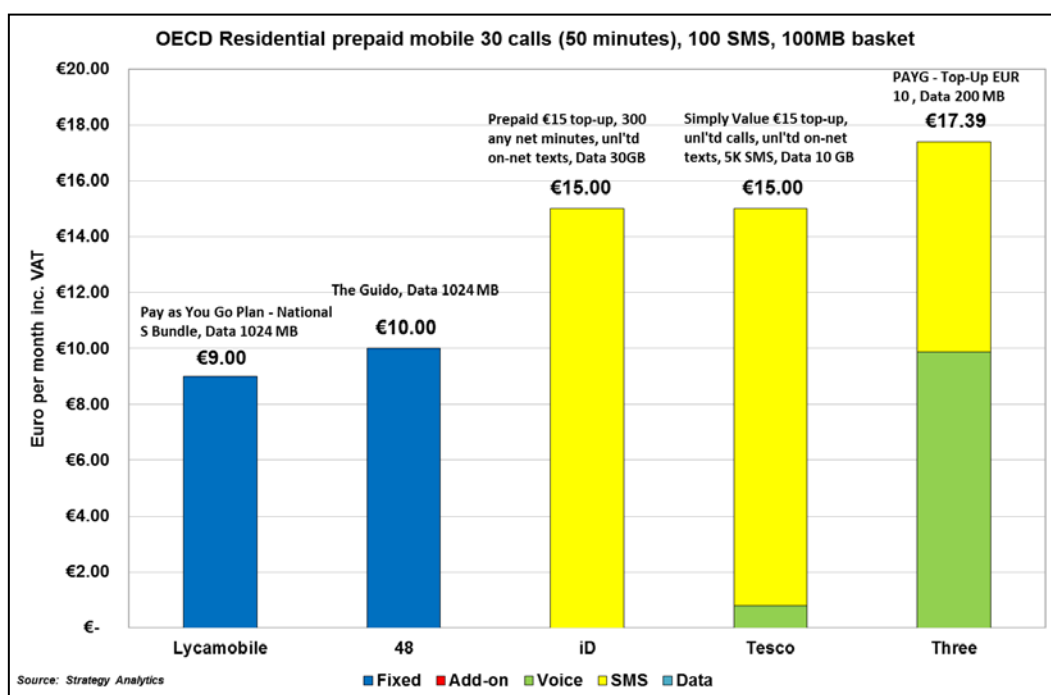


Figure 4.9.2 illustrates Ireland's ranking alongside five other Western European countries. Ireland ranks in second place with an average price of €9.21¹²¹ for this particular basket. The average price in Ireland is 37% cheaper than the average price¹²² for all of the countries included in the analysis.

¹²⁰ Fixed element of the price refers to the pre-paid tariffs that require mandatory top-ups.

¹²¹ As noted previously, average prices used for international comparisons exclude VAT charges.

¹²² The average of prices presented in Figure 4.9.2.

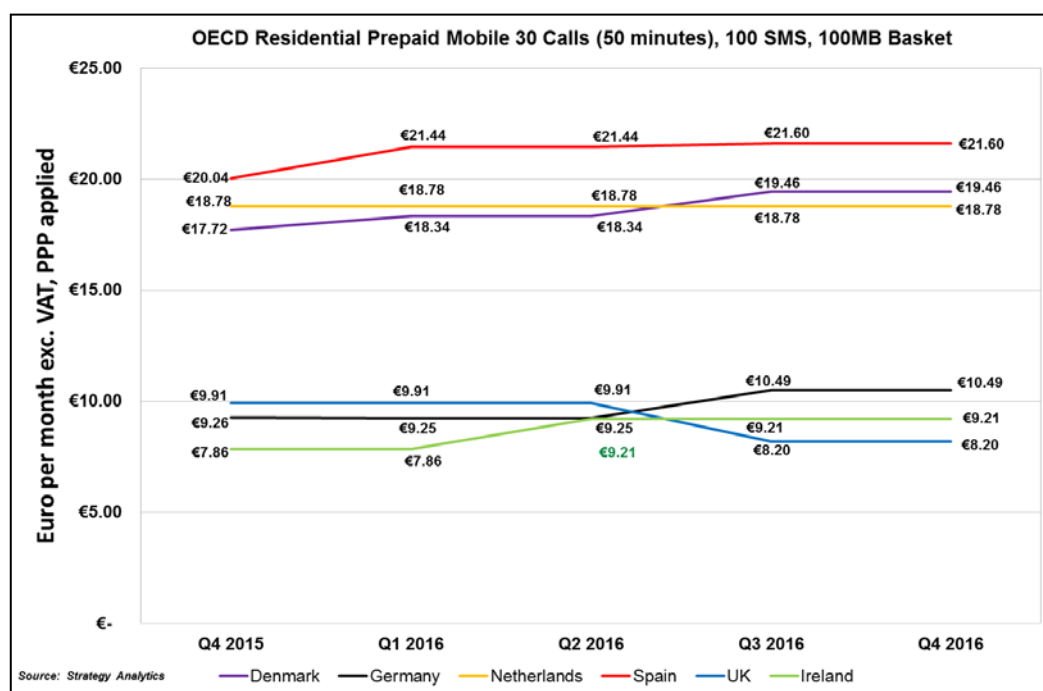
Figure 4.9.2 – Residential Pre-paid Mobile Phone Services Basket (International)**OECD Post-Paid Residential Mobile Basket**

Figure 4.9.3 compares post-paid tariffs advertised by mobile phone service providers for residential customers based on a basket of 100 calls (182 minutes), 140 SMS and 2GB data usage. Meteor offers the cheapest tariffs for this particular basket at €19.17 followed by iD (€20.00) and Tesco (€25.00).

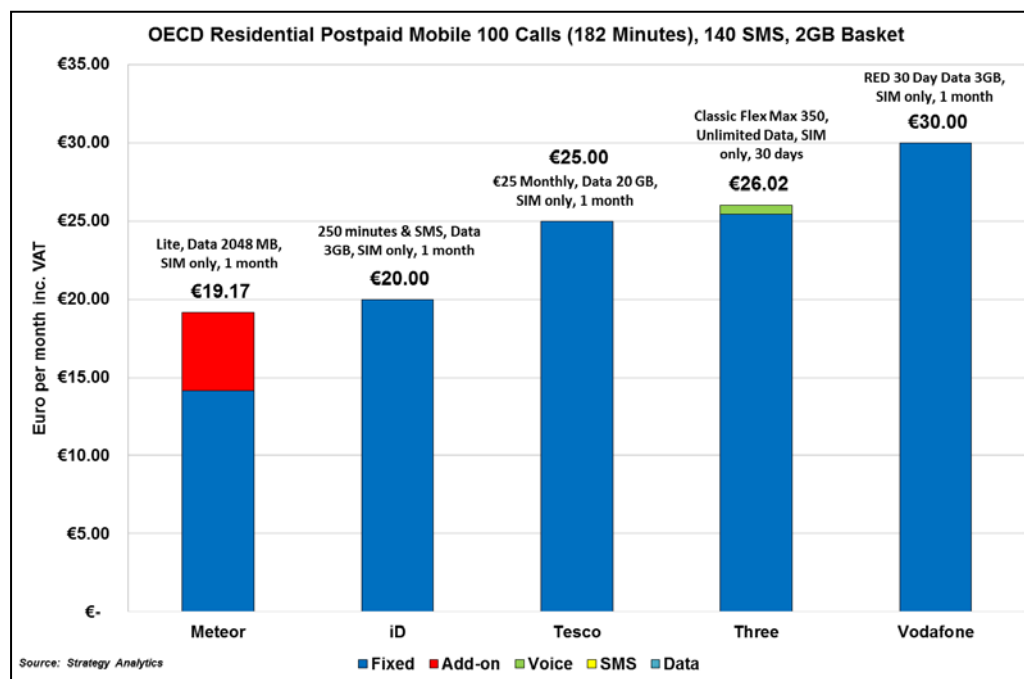
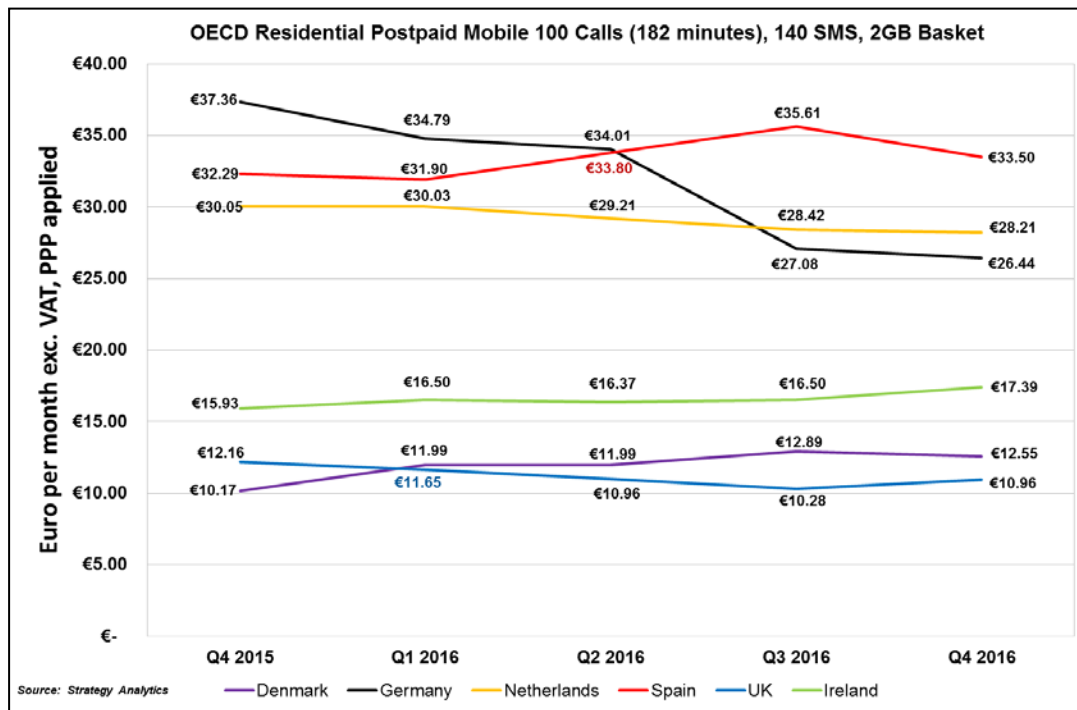
Figure 4.9.3 – Residential Post-paid Mobile Phone Services Basket (National)

Figure 4.9.4 shows that Ireland (€17.39¹²³), in an international comparison context, ranks in third place. The average price in Ireland is 19.1% cheaper than the average price¹²⁴ for all of the countries included in the analysis.

Figure 4.9.4 – Residential Post-paid Mobile Phone Services Basket (International)



OECD Post-Paid Business Mobile Basket

Figure 4.9.5 compares post-paid tariffs advertised by mobile phone service providers¹²⁵ for business customers based on an OECD basket of 300 calls (569 minutes), 225 SMS and 1 GB data usage. Presented prices exclude VAT charges. Eir Mobile offers the cheapest tariff for this particular basket at €20.00, followed by Three (€25.00) and Vodafone (€40.00).

¹²³ As noted previously, average prices used for international comparisons exclude VAT charges.

¹²⁴ The average of prices presented in Figure 4.9.4.

¹²⁵ Only tariffs advertised by Vodafone and Three were analysed for business customers. Some operators do not offer services to business customers.

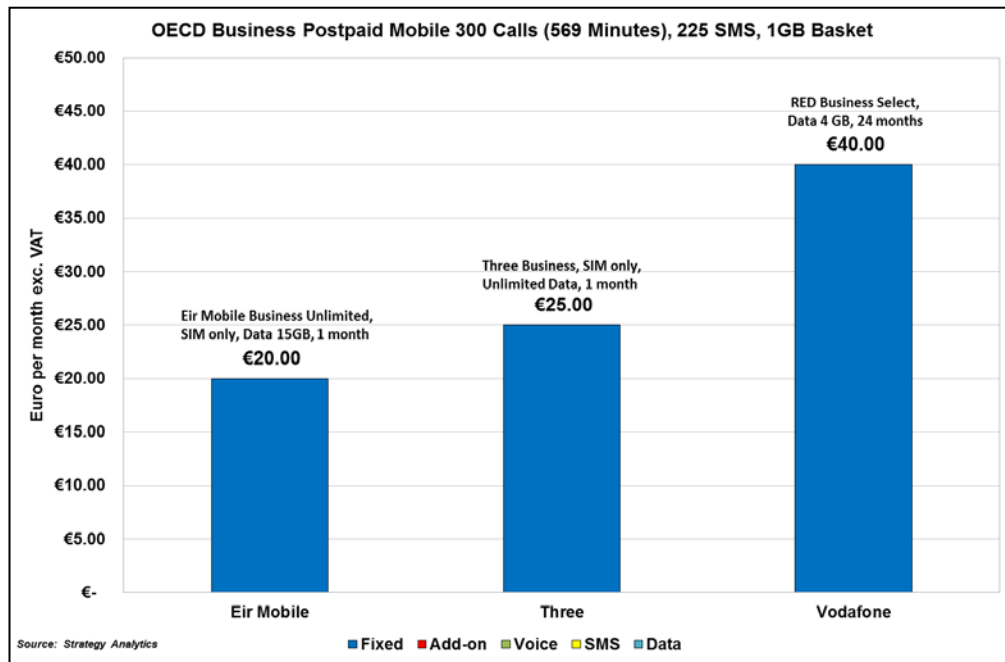
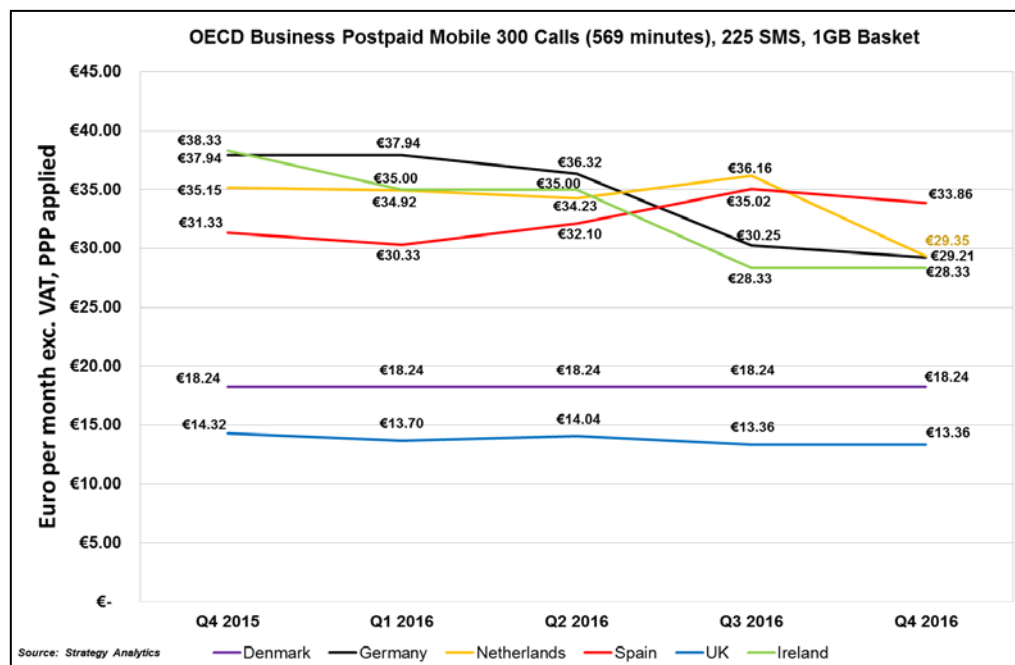
Figure 4.9.5 – Business Post-paid Mobile Phone Services Basket (National)

Figure 4.9.6 illustrates Ireland's ranking alongside five other Western European countries. Ireland ranks in third place with an average price of €28.33¹²⁶ for this particular basket. The average price in Ireland is 11.6% more expensive than the average price¹²⁷ for all of the countries included in the analysis.

Figure 4.9.6 – Business Post-paid Mobile Phone Services Basket (International)

¹²⁶ As noted previously, average prices used for international comparisons exclude VAT charges.

¹²⁷ The average of prices presented in Figure 4.9.6.

5. Broadcasting

5.1 Overall Broadcasting Market

This broadcasting data is from the Nielsen TV Audience Measurement (TAM) Establishment Survey.¹²⁸ The Survey indicated that there were 1,578,000 TV homes in Ireland in January 2017.¹²⁹ Figure 5.1.1 shows the estimated number of TV homes by reception type in January 2017 and July 2016 on the basis of the reception method through which the highest number of TV channels is received. Irish terrestrial DTT only homes represented 12.1% of all TV homes (although 42% of TV homes receive Irish DTT) as of January 2017. Cable/satellite platforms represented the remaining 87.9% of all TV homes in Ireland.¹³⁰

Figure 5.1.1 – TV Homes by Reception Type¹³¹

Reception	January 2017 (000s)	January 2016 (000s)	Jan. 2016 as % of Total TV Homes	% Change Jan. '16 – Jan. '17
Irish Terrestrial	191	186	12.1%	+2.7%
Multi Total	1,387	1,383	87.9%	+0.3%
Analogue Cable/Sat	16	21	1.0%	-23.8%
Digital Cable/Sat	1,371	1,362	86.9%	+0.7%
IPTV	51	29	3.2%	+75.8
Total Cable/Sat	1,387	1,383	87.9%	+0.3%
Total TV Homes	1,578	1,569	N/A	+0.6%
RECEPTION: Reception type categories are hierarchically defined and mutually exclusive. A home is classified once within reception type and this is based upon the highest form of reception available within the home.				
Multi Total: Made up of UK DTT / FTA Satellite, Cable, and SKY homes.				
Irish Terrestrial refers to homes which only receive any or all of the following: RTÉ One, RTÉ Two, UTV Ireland, TV3, TG4, 3e, RTÉ One+1, RTÉ News Now, RTÉ jr via an aerial and a set-top box or an aerial and an integrated digital TV or via Saorsat.				
Cable/Satellite: Includes UK DTT / FTA Satellite, Cable, IPTV and SKY homes. Sky homes based on the possession of SKY boxes, not on being SKY subscribers.				

¹²⁸ The Establishment Survey is a survey produced by Nielsen TV Audience Measurement (fieldwork is carried out by Behaviours and Attitudes) on behalf of Television Audience Measurement Ireland Ltd (a TV ratings body). The Establishment Survey covers areas such as ownership of TV related equipment, method of TV reception and demographics of TV household individuals such as age etc.

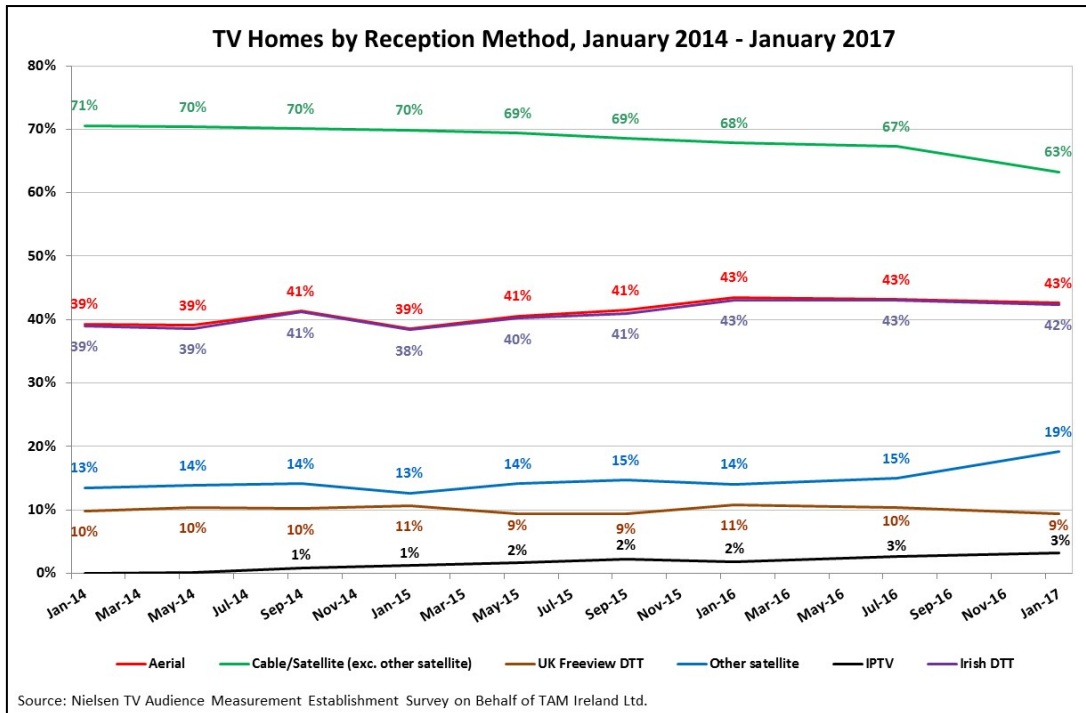
¹²⁹ From Q2 2016 TAM data is based on biannual surveys (January and July) rather than three times a year. Therefore Q2 and Q3 will contain the same data as will Q4 and Q1 of the following year.

¹³⁰ Approximately 362,000 of those reported above as digital cable/sat and total cable/sat are UK DTT/FTA satellite. MMDS (Multichannel Multipoint Distribution Service), was discontinued in April 2016.

¹³¹ Source: Nielsen TV Audience Measurement Establishment Survey on behalf of TAM Ireland.

Figure 5.1.2 shows TV homes by reception method¹³² from January 2014 to January 2017. The percentage of cable/satellite TV homes (this does not include other satellite i.e. respondents who said 'don't know' and satellites that receive foreign language stations including freesat) has declined from 71% to 63% over the last three years.¹³³ Television homes that subscribe to other satellite services beside Sky represented 19% of TV homes in January 2017. Reception by IPTV method is relatively low (3% of TV homes). Approximately 42% of TV homes have Irish DTT.

Figure 5.1.2 – TV Homes by Reception Method¹³⁴



¹³² This is determined by the method by which homes with a TV receive their channels. Each home can have more than one method of reception e.g. aerial and cable or digital satellite, digital satellite and cable, etc. The question is asked for their main and up to 9 TV sets. For this reason, the total for the reception methods adds up to more than 100%.

¹³³ It should be noted that from September 2011 the reporting of the cable/satellite figure has changed. This is because up to September 2011 cable/satellite reception method included homes that had both cable and satellite twice (i.e. (1) cable, (1) satellite). Nielsen now publish homes with cable and satellite as one reception method - as cable or satellite (i.e. cable or satellite (1)).

¹³⁴ As of November 2012 'Aerial' includes Saorsat homes. Irish DTT includes Saorsat. Cable/satellite includes MMDS and IPTV, excludes UK DTT, Irish DTT and Saorsat.

Figure 5.1.3 shows that, the total number of TV homes in January 2017 has increased by 0.6% since January 2016. Digital TV homes represent 98.9% of all TV homes compared to 75.5% in January 2012.

Figure 5.1.3 – TV Homes 2012 –2017

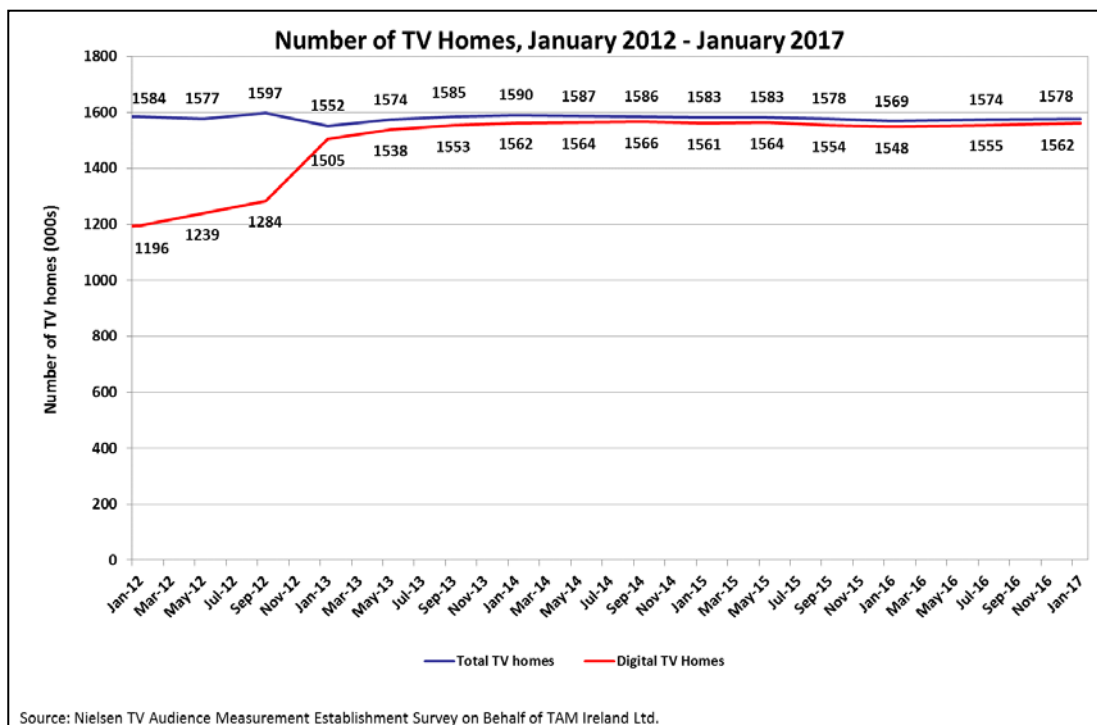
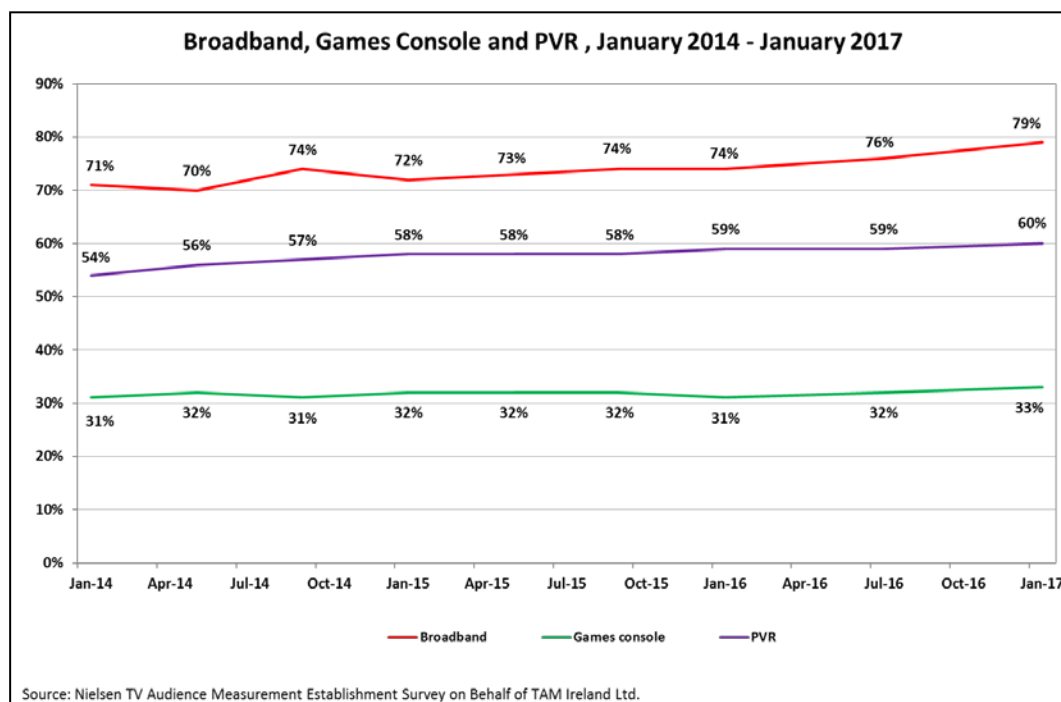


Figure 5.1.4 shows TV homes by broadband ¹³⁵ access, game console and PVR ¹³⁶ ownership between January 2014 and January 2017. Broadband access was present in circa 79% of homes with a television in January 2017. The number of homes with games consoles has increased over the last three years from 31% to 33%. PVR ownership was 60% in January 2017; up from 54% in January 2014.

Figure 5.1.4 – Broadband, Games Console and PVR Trends

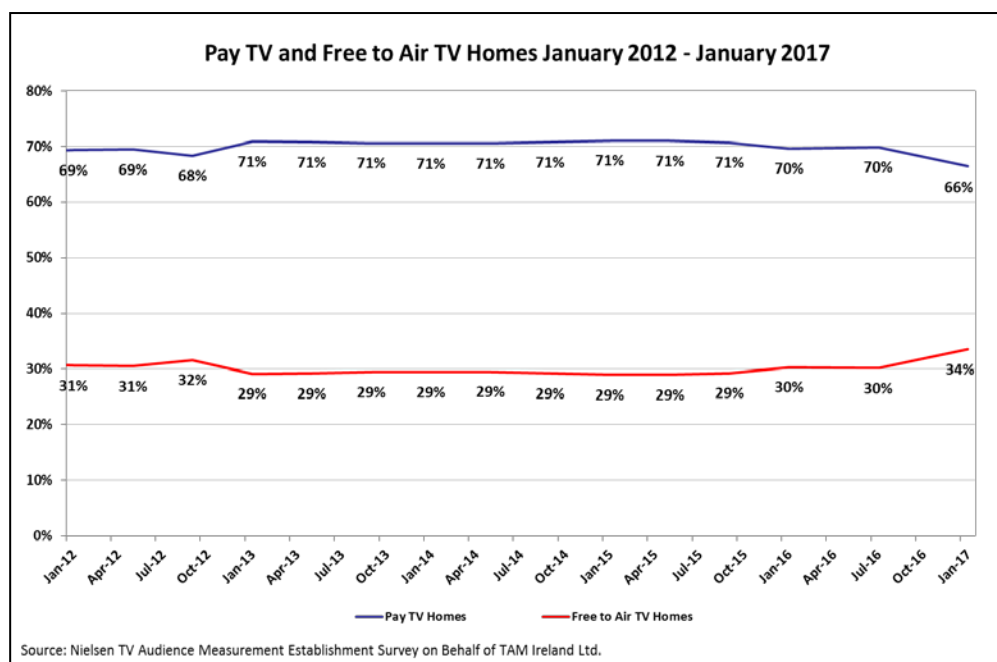


¹³⁵ Both fixed and mobile broadband.

¹³⁶ A PVR is an electronic device used to record media digitally. The PVR is also known as a digital video recorder or DVR. A PVR records and plays back television programmes, but, unlike the VCR, it stores the programs in digital rather than analogue format, for example, SKY+Box, or Virgin Media Digital Video Recorder.

Figure 5.1.5 shows the level of household penetration of pay TV services and free to air TV services in Ireland based on reception method. This chart has been derived by ComReg using Nielsen data and is not a classification used by Nielsen or a classification used as part of the survey itself. Homes with a pay TV (cable, satellite and IPTV homes) ¹³⁷ service were generally stable from January 2013 to July 2016 at 71% average of all TV homes. However, we have seen a decrease in the latter half of 2016 with the figure at 66% in January 2017.

Figure 5.1.5 – Pay TV vs Free to Air TV Homes, 2012 - 2017



¹³⁷ IPTV is included from September 2011.

6. Appendix

Sky Ireland's distribution of subscriptions by type (single play, double play or triple play) is estimated using percentage distribution of Sky Ireland's subscriptions obtained from the market survey data conducted by Behaviour & Attitudes Ltd. The fieldwork on ComReg's behalf was carried out between 21st December 2016 – 6th January, 2017. 974 respondents¹³⁸ were asked the following question:

- Does the service provider, Sky, provide any of the following services in your home?
 - TV
 - Broadband
 - Home Landline service

Respondents who stated that Sky provides more than one service (101 respondents) were then asked the following question:

- You mentioned that Sky provides your (previous answer). Do you receive one bill for these services (if 2 services mentioned) receive one bill for at least two of this services (if 3 services mentioned)?

The respondents who gave a positive answer to the second question (81 respondents) are categorized as bundle subscribers.

Table A1: Sky Ireland's Distribution of Subscriptions Type

Subscription type (n=516)¹³⁹	Number of Sky's subscriptions	% share of total Sky's subscriptions
TV	389	75.4%
Broadband	39	7.6%
Fixed Voice	7	1.4%
TV and Fixed Voice	2	0.4%
TV and Broadband	43	8.3%
Fixed Voice and Broadband	1	0.2%
TV, Fixed Voice and Broadband	35	6.8%

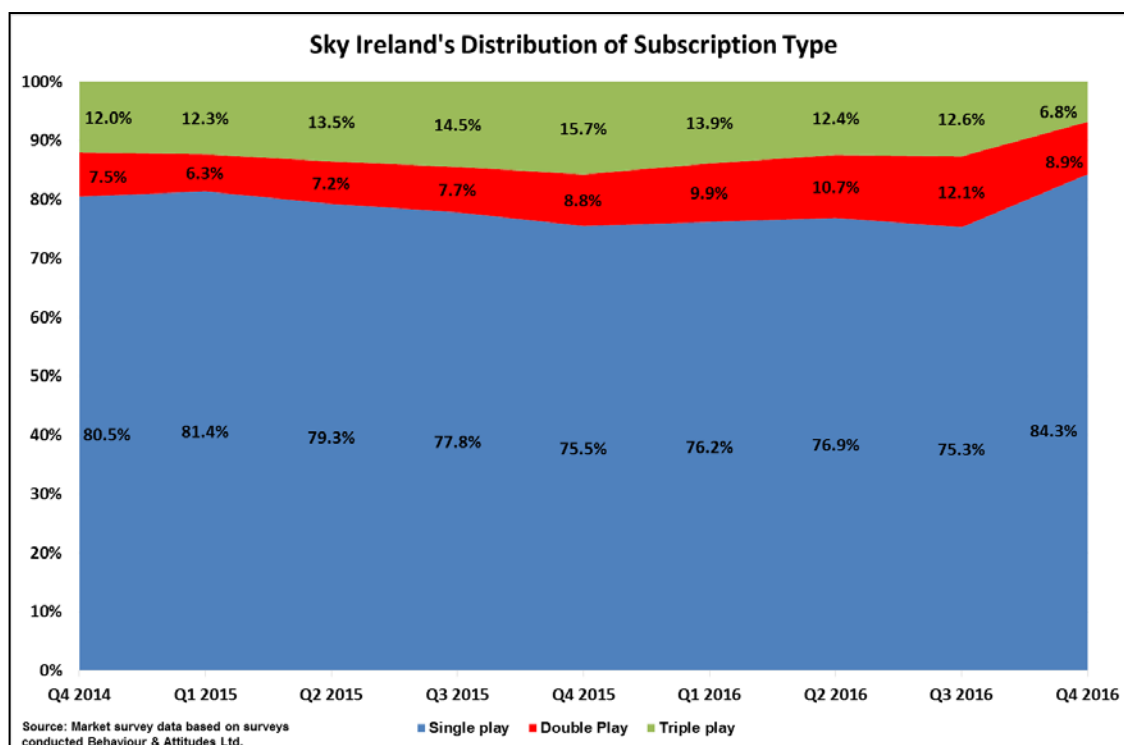
¹³⁸ The sample was nationally representative.

¹³⁹ The margin of error for the sample who stated that Sky Ireland provided them with at least one service in Q4 2016 was approximately +/- 4.5%.

Survey results showed that 84.3% of Sky Ireland's subscribers were subscribing to one service, 8.9% to two services and 6.8% to three services.

Figure A2 shows the estimated distribution of Sky Ireland's subscriptions by type over the last two years. As of Q4 2016 the number of bundled subscriptions (double and triple play) accounts for 15.7% of all Sky Ireland's subscriptions compared to 19.5% in Q3 2014.

Figure A2: Sky Ireland's Distribution of Subscription Type



The following table lists Respondents who submitted data which was used to produce the Q4 2016 Quarterly Key Data Report.

Table A3: List of Respondents

Respondent Name (N=41)
AirSpeed Telecom
AT&T Global Network Services Ireland Ltd.
ATS Voice Ltd.
Blueface Ltd.
BT Communications Ireland Ltd.
Casey Cablevision Ltd.
Colt Technology Services Ltd.
Crossan CableComm Ltd.
Digitalforge
Digiweb Ltd.
Edge Telecommunications Ltd.
Eircom Ltd.
E-Net
Equant operations in Ireland (EGN BV and ENS Ltd.)
ESB Telecoms
EuNetworks Ireland Private Fiber Ltd.
Europasat Satellite (Ireland) Ltd.
Fastcom Broadband Ltd.
Fulnett Limited t/a Strencom
ID
IFA Telecom
Imagine Group
Level 3 Communications (Ireland) Ltd.
Lycamobile Ireland Ltd.
Magnet Networks Ltd.
Meteor Mobile Communications Ltd.
Modeva Networks
Nova Networks Ltd.
Permanet Ltd.
Postmobile
Pure Telecom Ltd.
Rapid Broadband Ltd.
Ripplecom Ltd.
Sky Ireland Ltd.
SprintLink Ireland Ltd.
Tesco Mobile Ireland Ltd.
Three Ireland (Hutchison) Ltd.
Virgin Media Business Ltd.
Virgin Media Ireland Ltd.
Verizon Ireland Ltd.
Vodafone Ireland Ltd.