

# **RTR TELEKOM MONITOR**

2017 Annual Report

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**Austrian Regulatory Authority  
for Broadcasting and Telecommunications**  
(Rundfunk und Telekom Regulierungs-GmbH)  
Mariahilfer Strasse 77–79, 1060 Vienna, Austria  
Tel.: +43 (0)1 58058-0; fax: +43 (0)1 58058-9191;  
e-mail: [rtr@rtr.at](mailto:rtr@rtr.at), **web: [www.rtr.at](http://www.rtr.at)**

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# Preface

Dear readers,

several new features and changes await you in this edition of the RTR Telekom Monitor. The Communications Survey Ordinance (KEV) authorises us to perform a monthly survey of telecommunications provider data, which can be seen as constituting the core of the RTR Telekom Monitor. As of 1 October 2017, an amendment to the KEV took effect, which is intended to reflect the continued changes in the telecoms markets, along with the evolving product landscape in the broadband and mobile segments, and the changing patterns of product use among end users. The new items include statistics on fixed data volumes, a new distinction regarding revenues and SIM cards in mobile telecommunications, and new bandwidth categories for leased lines and Ethernet services. The modified database has in many cases made it necessary to adapt the charts from previous years. Where this is the case, you will find a note clearly pointing out the change.

The focus of this annual report is on comparisons with previous years and on Austria's position in specific rankings. In addition, we provide a summary of the international situation and discuss the topic of roaming.

In view of the wealth of internet-related topics and the overwhelming importance of the internet for business and society, we plan to soon unveil a new quarterly publication that will showcase a broad array of issues relating to the internet and broadband. In the new publication, you will in future find the sort of statistics and evaluations that we are now able to make available thanks to the RTR-NetTest.

Finally, I wish to draw your attention to our Open Data portal. At <https://www.rtr.at/en/inf/odKEV> you can view, in the Open Data format, the current data for the RTR Telekom Monitor, as well as past data surveyed in accordance with the KEV (going back to Q1 2012).

I hope this report provides you with interesting reading.

**Mag. Johannes Gungl**

*Managing Director  
Telecommunications and Postal Services Division  
RTR*



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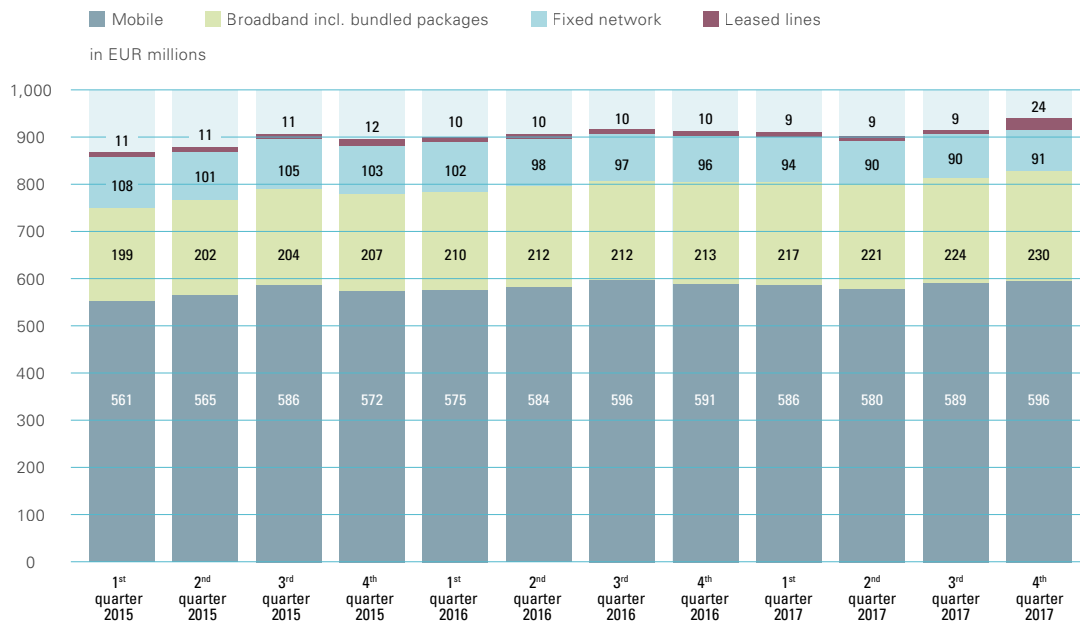


# Market summary

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## Retail revenues from mobile, broadband, fixed voice and leased line services

➔ Retail revenues in 2017 totalled almost EUR 3.7 billion

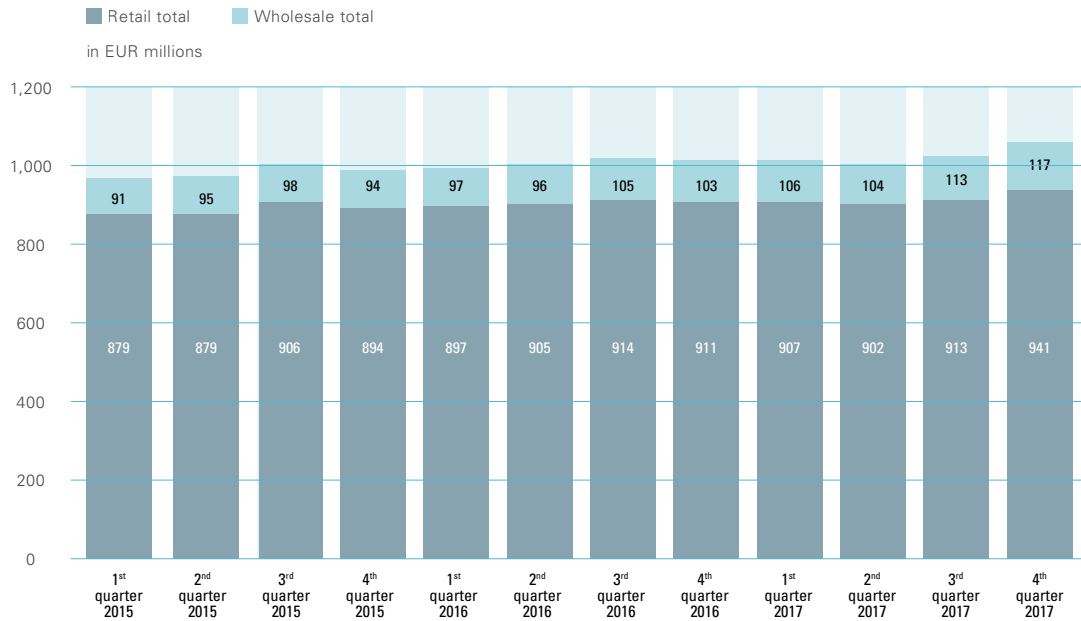


- The retail market for telecommunications services generated revenues of some EUR 3.662 billion in 2017. The figure for the previous year was EUR 3.626 billion.
- In 2017, 64.3% of this total was mobile revenue, amounting to EUR 2.352 billion (+0.3% year-on-year).
- Some EUR 892.7 million was generated by broadband and bundled products. Compared with 2016, this equates to a substantial increase of 5.4%.
- In 2017 revenue from fixed network voice services was around EUR 365.1 million, amounting to some 10% of total retail segment revenues, and a fall of 7.1% in comparison with 2016.
- Leased line revenue in 2017 totalled EUR 51.9 million; only a limited year-on-year comparison is possible as a result of query content changes in Q4 2017 (see Glossary). Leased line revenue made up only 1.1% of total revenues.

The chart includes revenues from the categories of mobile services, broadband (fixed network), bundled products, fixed network voice services and leased lines (see Glossary).

## Total revenues from telecommunications

➔ Retail revenues make up around 90% of total revenues

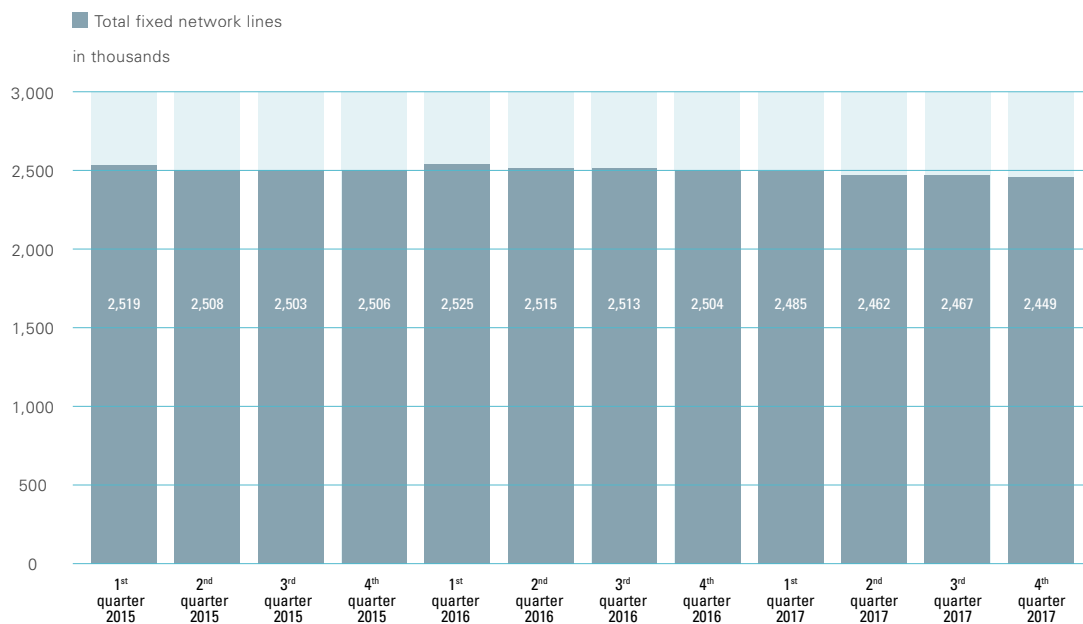


- Total revenues for the sector comprise retail revenues and wholesale revenues (see Glossary). In 2017 total revenues were EUR 4.102 billion, a gain of 1.8% compared with the previous year.
- Wholesale revenues amounted to EUR 439.6 million in 2017 (+9.3% compared with 2016) and thus around 10.7% of total revenues.

While the retail market involves services being offered directly to consumers, the wholesale market represents telecoms companies offering services to one another. The chart presents retail and wholesale revenues separately.

## Connections for fixed network voice telephony

➔ Downward trend for fixed network lines continues in 2017

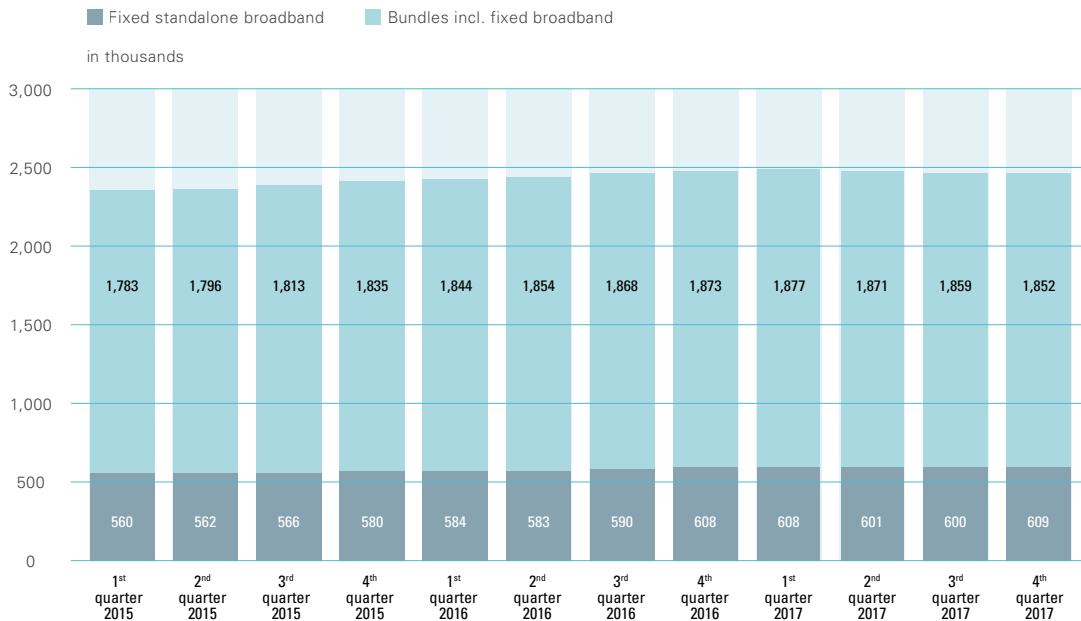


- At the end of 2017, there were around 2.4 million fixed network lines in Austria. Compared with the end of 2016, this marks a further decline of 2.2%.

The chart above shows the total number of fixed voice lines in households and businesses, regardless of the underlying infrastructure (e.g. copper wire pairs, coaxial cable or optical fibre). This also includes connections that are implemented as voice-over-broadband connections (see Glossary).

## Broadband and bundled products

➔ Three quarters of fixed broadband connections purchased as a bundle

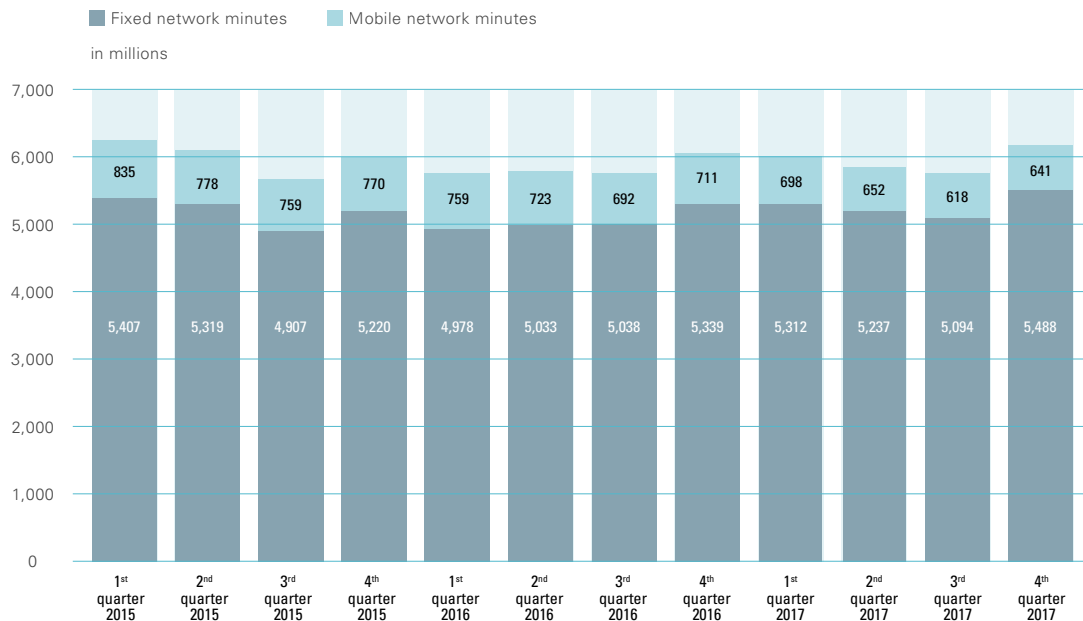


- At the end of 2017, some 2.5 million fixed broadband and bundled products were registered, 0.2% fewer than a year before.
- Of these, 608,600 are fixed broadband products without a bundle (standalone). This is a rise of 0.2% compared with 2016.
- The number of bundled products containing fixed broadband is 1.1% lower than in 2016. In absolute terms, this equals 1,851,900 products.
- From Q4 2017 onwards, data is also collected on bundled products that do not contain fixed broadband (e.g. voice and TV, voice and mobile, or TV and mobile). There were around 16,200 such products at the end of 2017 (not shown).

The chart shows the number of broadband products sold to retail customers, where the products are based on the provider's own infrastructure or an unbundled line and not on additionally purchased infrastructure. Broadband products may be fixed broadband products sold without any other product ('standalone') or can be a combination of fixed broadband with one or more other products (bundled product).

## End-user minutes in mobile and fixed networks

➔ Upward trend for mobile minutes

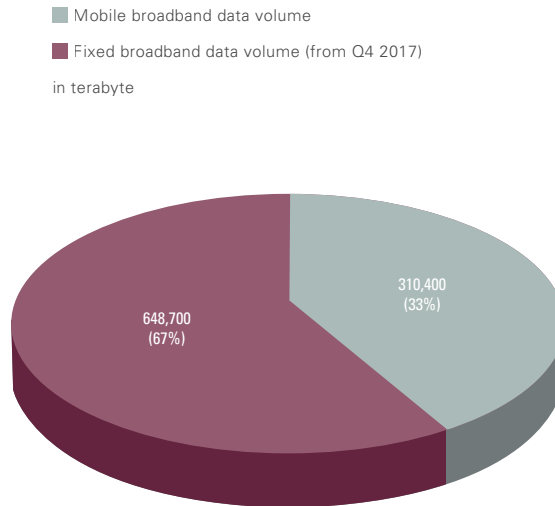


- The chart illustrates a longstanding trend: the number of fixed network call minutes is declining while mobile minutes are increasing.
- In total, callers logged some 23.675 billion minutes in 2017, a rise of 1.7% compared with 2016.
- Of these, 89% were placed from mobile networks (21.066 billion minutes), a rise of 3.3% compared with 2016.
- The remaining 11% were fixed network minutes (2.609 billion minutes), representing a fall of 9.6% compared with 2016.

The chart shows technical minutes (millions) from calls to the domestic fixed network, domestic mobile networks, international numbers, service numbers and directory assistance services.

## Fixed and mobile data volumes

➔ Fixed network data volume doubles mobile network volume

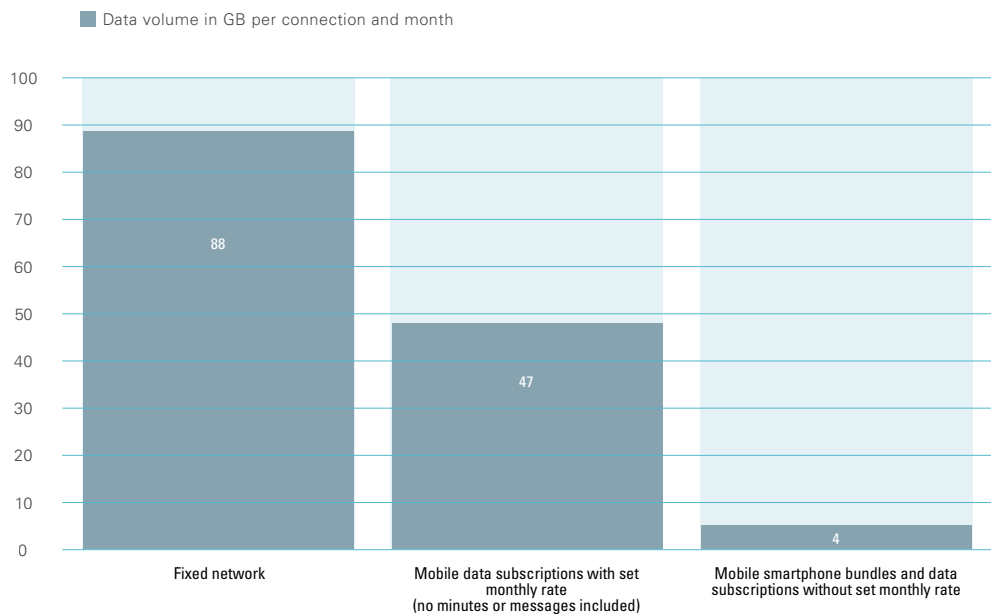


- Fixed data volume figures were also first made available in Q4 2017. An initial analysis of the data shows that broadband connections in Austria handled roughly double the volume of data consumed using mobile networks.
- The figure of around 648,700 terabytes of fixed network data contrasts with some 310,200 terabytes of mobile data. These figures total to around 959,000 terabytes of data consumed in Q4 2017.

The chart above shows the data volume in terabytes that was uploaded and downloaded in the mobile and fixed retail markets (1 terabyte = 1,024 gigabytes = 1,048,576 megabytes).

## Fixed and mobile data volume per connection

➔ An average of 88 gigabytes per month over fixed broadband connections



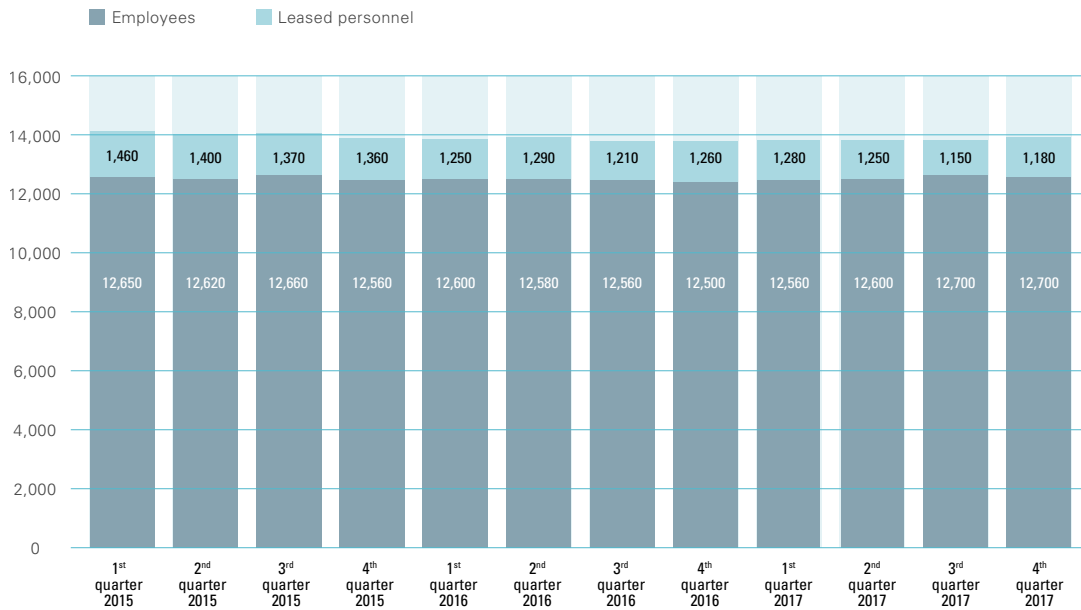
- If the average data volume consumed is calculated per connection and per month, this results in some 88 gigabytes upload/download for fixed broadband connections, while mobile data subscriptions (cubes, dongles and other dedicated data subscriptions without inclusive minutes and texts) handle some 47 gigabytes per month and per active mobile broadband connection. (An 'activity' criterion applies to mobile broadband: connections are counted only if used to access the Internet at least once in the quarter.)
- With other mobile data subscriptions (smartphone bundles with data included and plans without a free data volume), consumption is considerably lower: the average figure here per month and connection for upload/download volume is around 4 gigabytes.

The chart shows the volume of data uploaded/downloaded in the fixed network and mobile retail markets in gigabytes per connection and month. The figures are produced by dividing the quarterly data volume by the number of connections that customers have used to access the internet at least once in the particular quarter (and then dividing by three to obtain a monthly value).



## Employees in the telecoms sector

➔ Staffing levels virtually unchanged



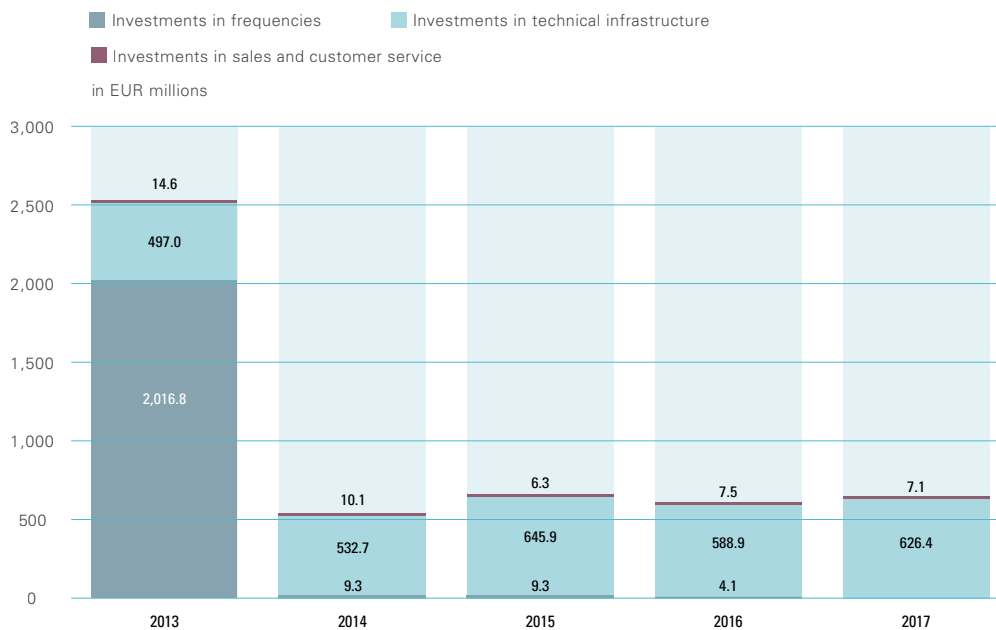
- At the end of 2017, 13,880 people were employed in the telecoms sector, a gain of 30 compared with the end of 2016.
- While the number of direct employees was unchanged at 12,700, the number of FTEs from personnel leasing agencies rose to 1,180.

The chart above shows the number of employees (in full-time equivalents) in the telecoms sector, broken down into employees directly employed by telecoms companies, leased employees and freelancers.

When interpreting these figures, it should be noted that only staff employed in the telecoms sector are included. The figures do not include employees in supplier industries, external call centre employees or outsourced positions.

## Investments

➔ Investments totalled EUR 634 million in 2017



- In 2017 capital investments totalled some EUR 633.6 million. This is a gain of 5.5% compared with 2016.
- This figure includes spending on technical infrastructure amounting to EUR 626.4 million (+6.4%), plus investments in sales and customer service totalling EUR 7.1 million (-4.4%).
- Grants received now feature in the data query. In particular, spending on infrastructure as part of broadband expansion is eligible for grants at state, federal and EU level. In 2017, grants received were around EUR 400,000 (not shown in the chart) according to data from operators – although this is far less than the total volume of grants awarded.
- For 2018, a significant increase in the level of capital spending is again expected, especially in light of the pending auctions in the 3.4 GHz to 3.8 GHz spectrum.

The chart above shows the changes from year to year in investments in technical infrastructure, sales and customer service. The values reported here are partly based on estimates, so that the total amount invested cannot be determined exactly. The investment volumes shown above only include those investments made directly by telecoms companies. They do not include investments by upstream or downstream branches of the industry. The figure for grants includes all grant funds actually paid out at federal, state or municipal levels, or by the European Union.

**TABLE 01: RETAIL REVENUES FROM MOBILE, BROADBAND, FIXED VOICE AND LEASED LINE SERVICES (IN EUR MILLIONS) SEE PAGE 8**

	Mobile	Broadband incl. bundled packages	Fixed network	Leased lines
Q1 2015	561	199	108	11
Q2 2015	565	202	101	11
Q3 2015	586	204	105	11
Q4 2015	572	207	103	12
Q1 2016	575	210	102	10
Q2 2016	584	212	98	10
Q3 2016	596	212	97	10
Q4 2016	591	213	96	10
Q1 2017	586	217	94	9
Q2 2017	580	221	90	9
Q3 2017	589	224	90	9
Q4 2017	596	230	91	24

**TABLE 02: TOTAL REVENUES FROM TELECOMMUNICATIONS (IN EUR MILLIONS) SEE PAGE 9**

	Retail total	Wholesale total	TOTAL
Q1 2015	879	91	971
Q2 2015	879	95	975
Q3 2015	906	98	1,004
Q4 2015	894	94	988
Q1 2016	897	97	994
Q2 2016	905	96	1,001
Q3 2016	914	105	1,019
Q4 2016	911	103	1,014
Q1 2017	907	106	1,013
Q2 2017	902	104	1,005
Q3 2017	913	113	1,025
Q4 2017	941	117	1,058

**TABLE 03: CONNECTIONS FOR FIXED NETWORK VOICE TELEPHONY (IN THOUSANDS) SEE PAGE 10**

	Total fixed network lines
Q1 2015	2,519
Q2 2015	2,508
Q3 2015	2,503
Q4 2015	2,506
Q1 2016	2,525
Q2 2016	2,515
Q3 2016	2,513
Q4 2016	2,504
Q1 2017	2,485
Q2 2017	2,462
Q3 2017	2,467
Q4 2017	2,449

**TABLE 04: BROADBAND AND BUNDLED PRODUCTS (IN THOUSANDS)**  
SEE PAGE 11

	Fixed standalone broadband	Bundles incl. fixed broadband
Q1 2015	560	1,783
Q2 2015	562	1,796
Q3 2015	566	1,813
Q4 2015	580	1,835
Q1 2016	584	1,844
Q2 2016	583	1,854
Q3 2016	590	1,868
Q4 2016	608	1,873
Q1 2017	608	1,877
Q2 2017	601	1,871
Q3 2017	600	1,859
Q4 2017	609	1,852

**TABLE 05: END-USER MINUTES IN MOBILE AND FIXED NETWORKS (IN MILLIONS)**  
SEE PAGE 12

	Fixed network minutes	Mobile network minutes
Q1 2015	835	5,407
Q2 2015	778	5,319
Q3 2015	759	4,907
Q4 2015	770	5,220
Q1 2016	759	4,978
Q2 2016	723	5,033
Q3 2016	692	5,038
Q4 2016	711	5,339
Q1 2017	698	5,312
Q2 2017	652	5,237
Q3 2017	618	5,094
Q4 2017	641	5,488

**TABLE 06 : FIXED AND MOBILE DATA VOLUMES (IN TERABYTE)**  
SEE PAGE 13

	Mobile broadband data volume	Fixed broadband data volume (from Q4 2017)
Q1 2015	59,100	
Q2 2015	64,800	
Q3 2015	76,200	
Q4 2015	99,200	
Q1 2016	109,900	
Q2 2016	124,500	
Q3 2016	142,900	
Q4 2016	194,200	
Q1 2017	223,100	
Q2 2017	235,200	
Q3 2017	266,800	
Q4 2017	310,400	648,700

**TABLE 07: FIXED AND MOBILE DATA VOLUME PER CONNECTION**  
 SEE PAGE 14

	Fixed network	Mobile data subscriptions with set monthly rate (no minutes or messages included)	Mobile smartphone bundles and data subscriptions without set monthly rate
Data volume in GB per connection and month	88	47	4

**TABLE 08: EMPLOYEES IN THE TELECOMS SECTOR**  
 SEE PAGE 15

	Employees	Leased personnel
Q1 2015	12,650	1,460
Q2 2015	12,620	1,400
Q3 2015	12,660	1,370
Q4 2015	12,560	1,360
Q1 2016	12,600	1,250
Q2 2016	12,580	1,290
Q3 2016	12,560	1,210
Q4 2016	12,500	1,260
Q1 2017	12,560	1,280
Q2 2017	12,600	1,250
Q3 2017	12,700	1,150
Q4 2017	12,700	1,180

**TABLE 09: INVESTMENTS (IN EUR MILLIONS)**  
 SEE PAGE 16

	Inv. in frequencies	Inv. in technical infrastructure	Inv. in sales and customer service	Total grants received
2013	2.016.8	497.0	14.6	
2014	9.3	532.7	10.1	
2015	9.3	645.9	6.3	
2016	4.1	588.9	7.5	
2017		626.4	7.1	0.4



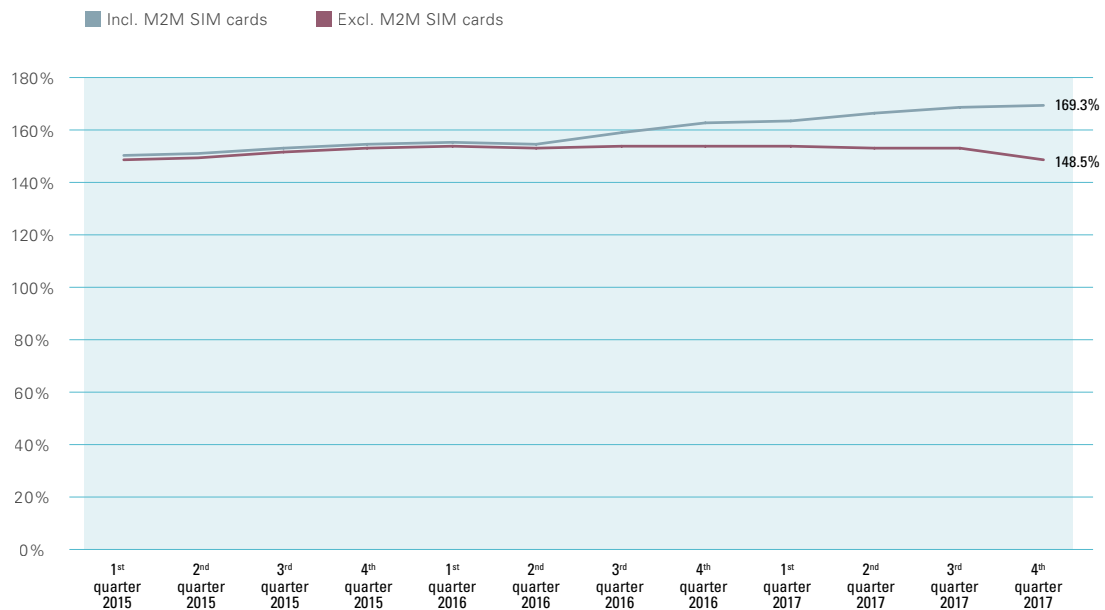
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# Mobile communications

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## Mobile penetration

### ➔ Mobile penetration rate rises again in 2017



Source for population figure: Statistics Austria

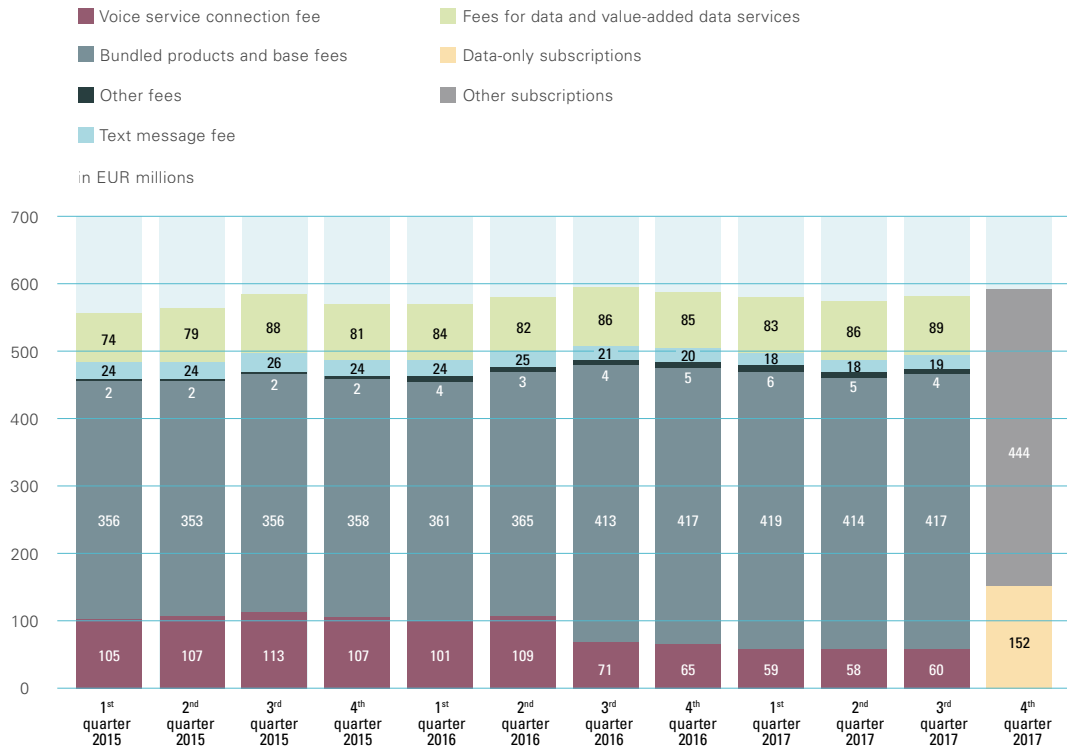
- Considered overall (including M2M SIM cards), the mobile penetration rate rose during the course of 2017 by 6.7 percentage points. Standing at 162.6% of the population at the end of 2016, the figure for Q4 2017 was 169.3%.
- If this same rate is considered without M2M SIM cards, however, the figure fell in the same period from 154.4% to 148.5% (-5.9 percentage points).
- The number of M2M SIM cards therefore rose swiftly in this period – from some 720,000 at the end of 2016 to nearly 1.8 million at the end of 2017. Not all of these SIM cards are used in Austria, however. As one example, vehicles from a German car manufacturer are being equipped with M2M mobile services from T-Mobile Austria.

The mobile penetration rate is calculated as the number of activated SIM cards divided by the country's population. This figure therefore represents the (notional) average number of SIM cards owned by every resident. However, it also includes both SIM cards used by businesses and machine-to-machine (M2M) SIM cards.



## Retail revenues from mobile telecommunications

### ➔ Modest growth in mobile retail revenues

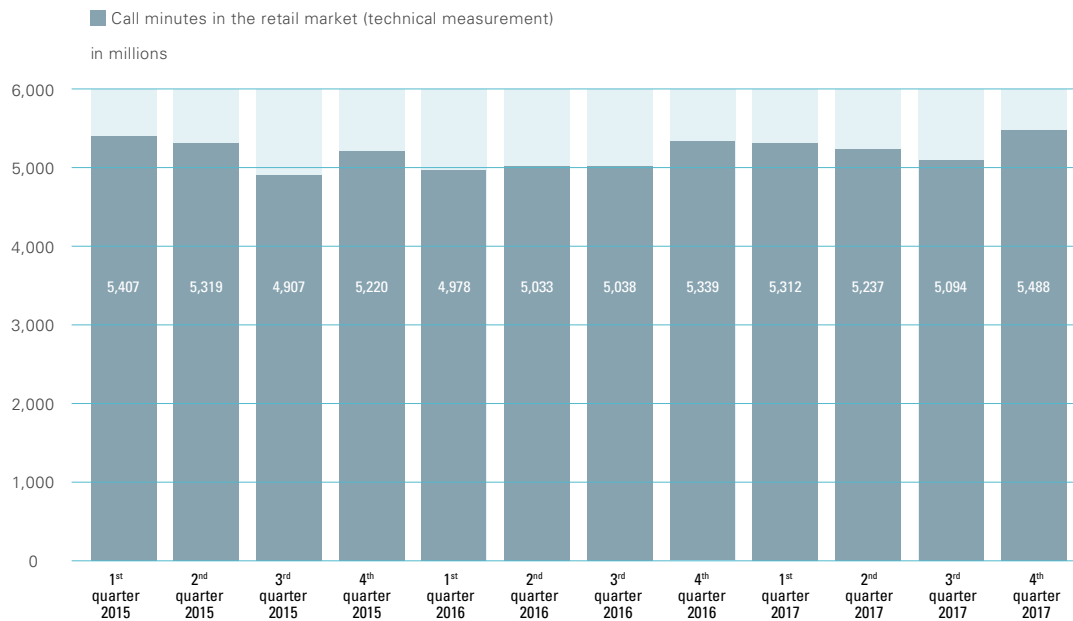


- In 2017 the mobile telecommunications retail segment generated revenues of some EUR 2.352 billion. This is an increase of 0.3% from 2016.
- In Q4 2017 revenues totalled EUR 596 million. A quarter of this was generated by data-only subscriptions (EUR 151.9 million) and the rest by other plans (EUR 444.1 million).

The chart shows all retail revenues for mobile services. The detailed differentiation of bundle revenues from revenues that can be clearly assigned to a category (voice, text, data; see Glossary) was replaced from Q4 2017 onwards with a distinction between data-only subscriptions (without voice/texts) and other plans (each including items such as corresponding one-time fees and fees for exceeding limits).

## Call minutes in the retail market

➔ Volume of mobile network call minutes rises for first time since 2012

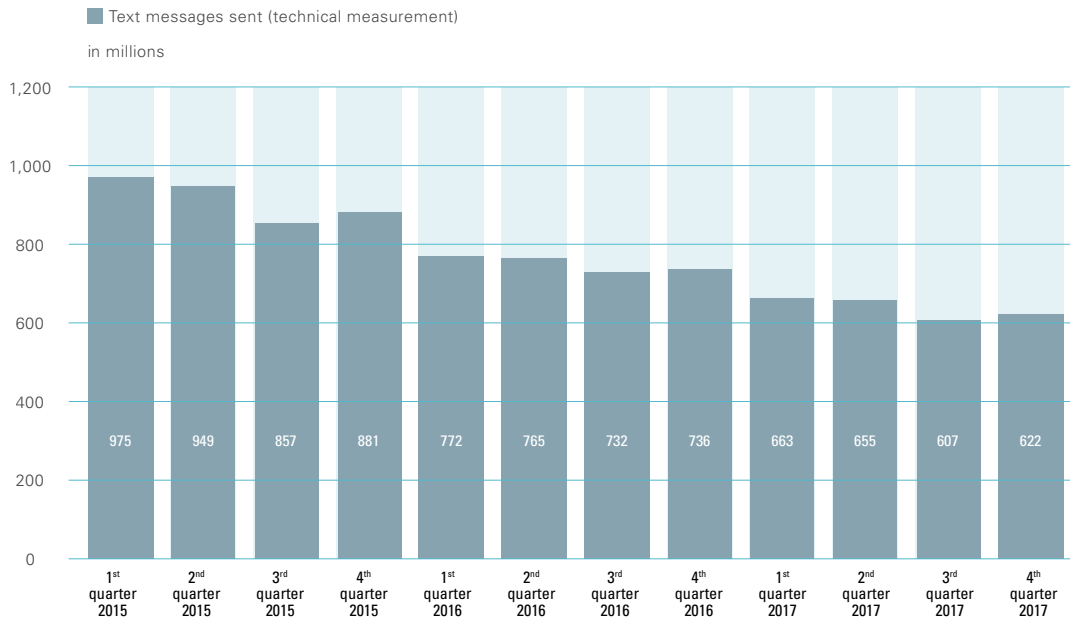


- In 2017 calls in mobile networks amounted to some 21.131 billion minutes. This equals an upswing of 3.6% compared with 2016.
- This marks a rise in annual mobile network call minutes for the first time since 2012. The figure showed a downward trend from 2012 to 2016.

The chart above shows the actual call minutes in mobile networks (based on technical measurement, see Glossary). The figure represents voice call minutes including value-added voice services, but not non-voice services or video calls.

## Text messaging

### ➔ Further fall in number of texts sent

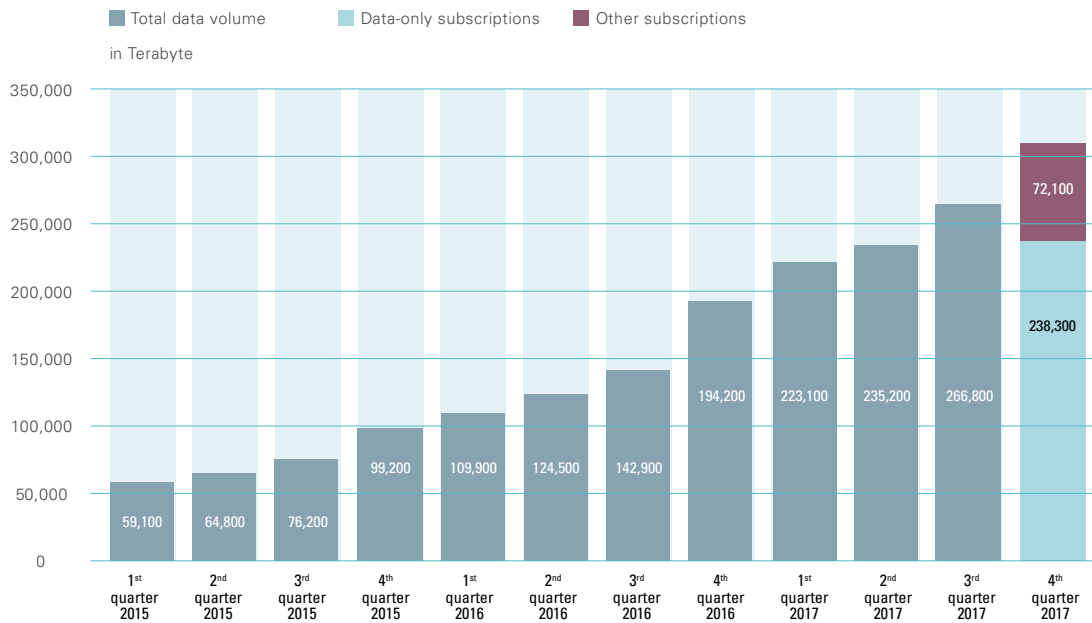


- In Q4 2017 some 622 million text messages were sent, which is a gain of 2.5% from the previous quarter. Year on year, however, far fewer text messages were sent in 2017, with the total figure being around 2.547 billion texts (-15.2% compared with 2016). Thus, the downward trend seen in previous years continued.

The chart above shows the number of text messages sent in the respective quarters (based on technical measurement). For text messages, similar to call minutes, the term 'technical measurement' refers to the fact that text messages not directly charged to the retail customer are also included (for example, text messages included in a basic monthly fee or flat rate). Multimedia messages are not included in these figures.

## Data volume in the retail market

➔ Mobile uploads/downloads total over 1 million terabytes

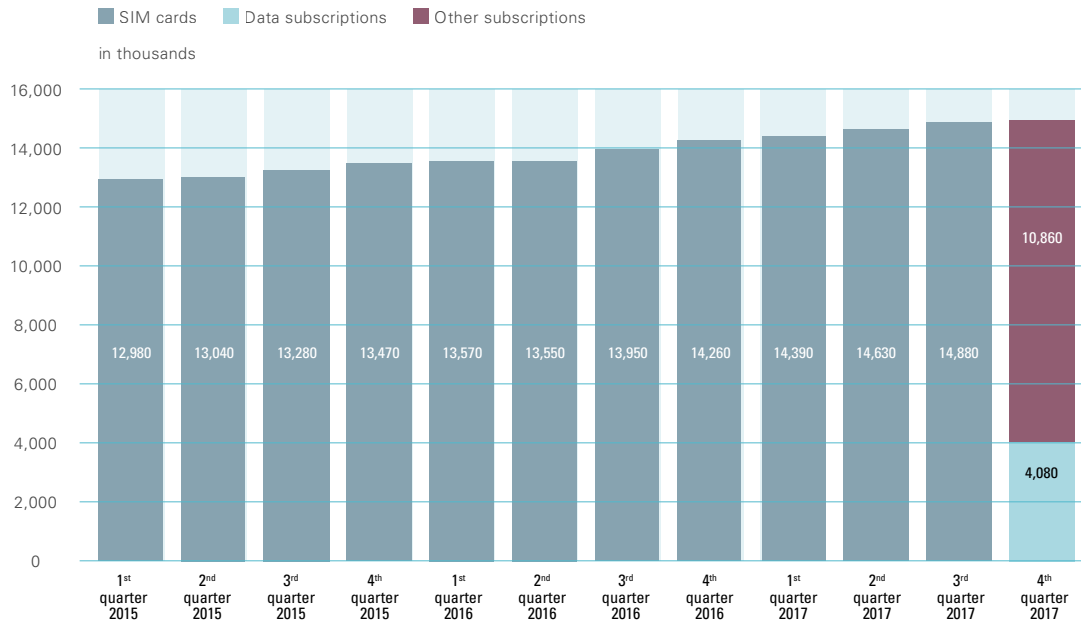


- In 2017 some 1,035,500 terabytes of data were used in total, which represents an increase of 81.2% compared with 2016. Thus, the strong upward trend continued. The data volume used has been rising exponentially in recent years.
- In Q4 2017, 310,400 terabytes were used. Of these, 76.8% were used in data-only subscriptions and 23.2% in other plans (e.g. smartphone bundles).

The chart above shows the data volume in terabytes that was uploaded and downloaded in the mobile retail market (1 terabyte = 1,024 gigabytes = 1,048,576 megabytes). From Q4 2017 onwards, a distinction is made between data volume in data-only subscriptions (no voice/texts) and in all other plans (e.g. smartphone plans).

## SIM cards in use

### ➔ Sharp rise in M2M SIM cards

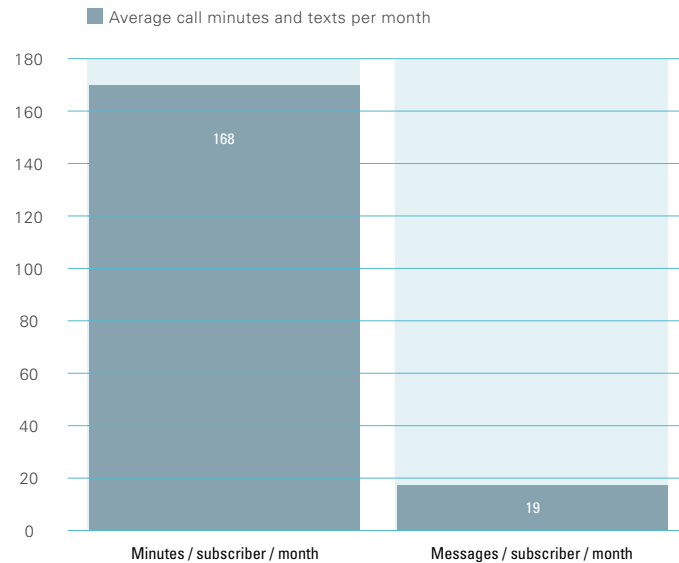


- At the end of 2017, some 14.9 million SIM cards were in circulation. This corresponds to growth of 4.7% since the end of 2016.
- Of this figure for total cards, around 4.1 million were used for data-only subscriptions and some 10.8 million cards for other plans.
- About 1.8 million SIM cards were explicitly reported as M2M SIM cards as of the end of 2017. Accordingly, the number of M2M SIM cards rose by 154.9% compared with the end of 2016.

The chart shows the number of used and active SIM cards (prepaid and postpaid). In the case of postpaid SIM cards, 'active' means that a customer has a valid contract. For prepaid, an activity criterion has been applied since Q4 2017: a prepaid SIM card is considered active only if a call has been placed or received, a text or MMS message has been sent, or data has been consumed at least once in the particular quarter. From Q4 2017, a distinction is made between data-only subscriptions and other plans (including M2M).

## Minutes and texts per month per SIM card

➔ 168 minutes and 19 texts per month in Q4 2017

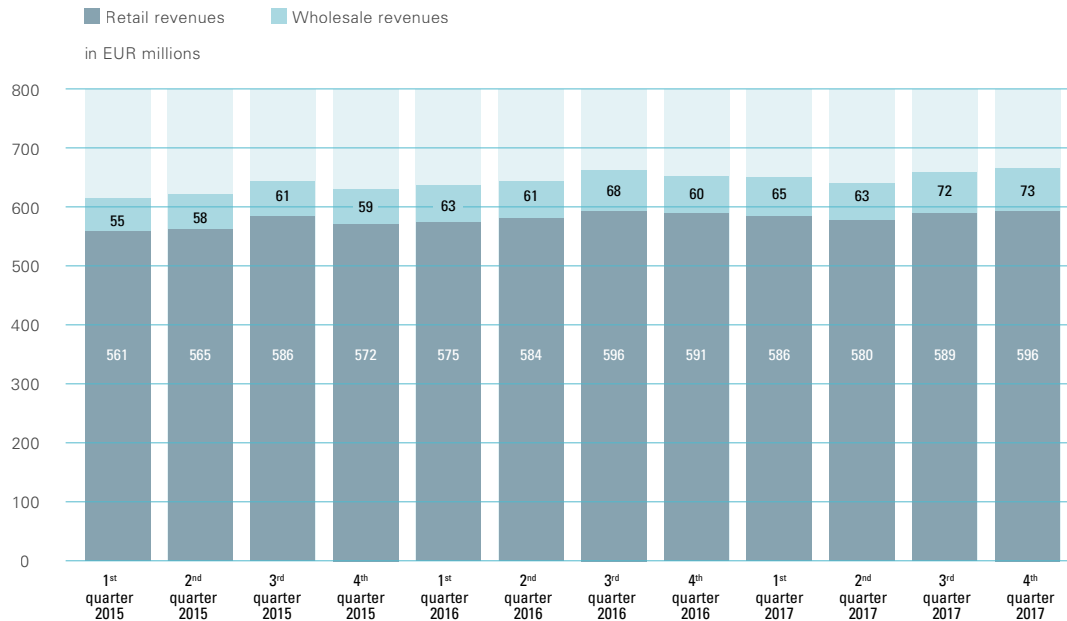


- In the 2017 reporting year, an average of 168 call minutes and 19 texts were logged per month and per SIM card in the 'Other subscriptions' category (i.e. excluding figures for SIM cards in the 'Data-only subscriptions' category). At 180 call minutes, the fourth quarter was therefore slightly above average.

The chart presents the average number of call minutes and texts sent for each month of the quarter. These values are calculated as a third of call minutes and the number of texts sent divided by the total of active SIM cards in the 'Other subscriptions' category (i.e. excluding data-only subscriptions, since it is assumed that these are primarily used for data) at the end of the quarter.

## Total mobile revenues

➔ Wholesale revenues rise while retail revenues stagnate

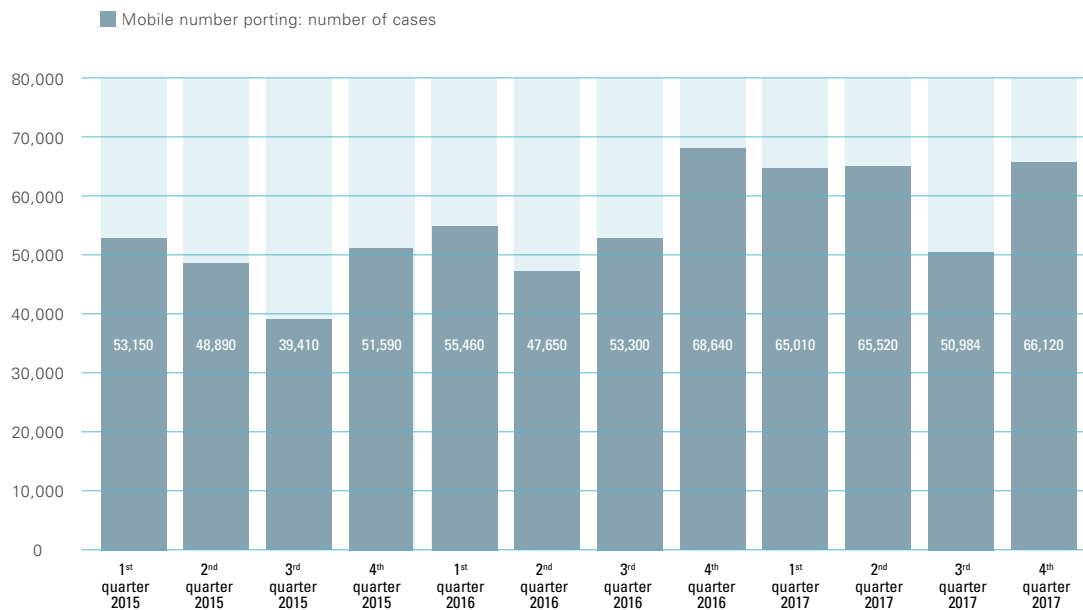


- Total revenues from the retail and wholesale mobile segments amounted to some EUR 2.625 billion in 2017. Thus, compared with 2016, a minor increase in revenues of 1% was achieved.
- Of these, retail mobile revenues amounted to EUR 2.352 billion (a modest gain of 0.3%).
- Wholesale revenues rose by 7.7% to total EUR 272.5 million in 2017, amounting to 10.4% of annual mobile network revenues.

The chart above shows the mobile revenues in the retail and wholesale markets (see Glossary).

## Porting of mobile telephone numbers

➔ Porting is trending upwards



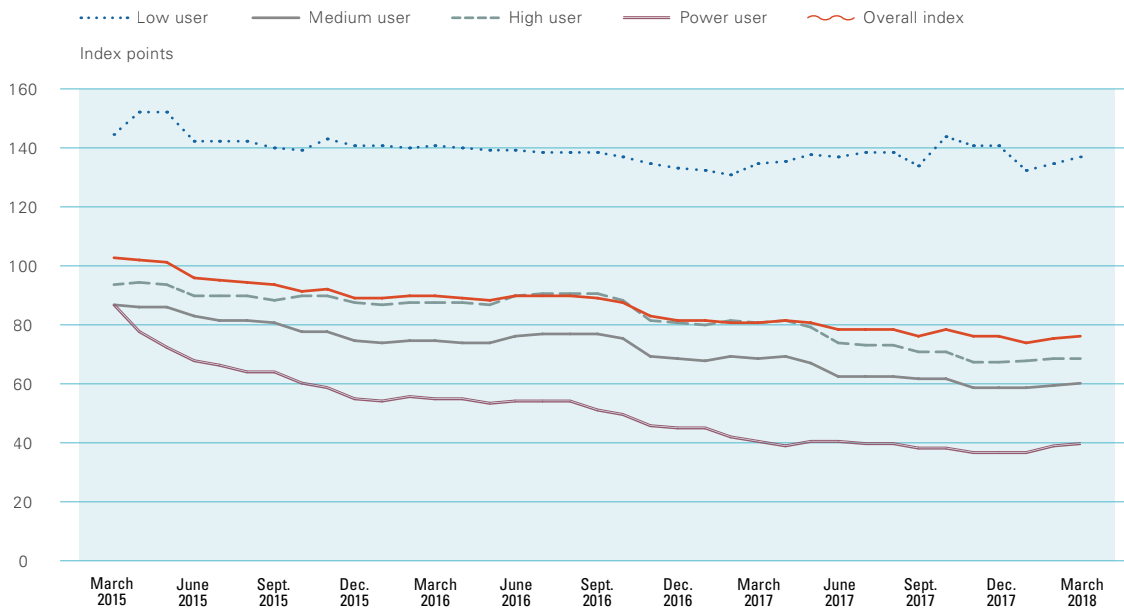
- In 2017 a total of 247,634 porting procedures were logged by mobile network operators.
- This equates to a year-on-year rise of 10%.

Number porting allows customers to retain their telephone numbers when switching service providers. The chart above shows the cases of porting procedures/imports of telephone numbers recorded for an operator in one quarter, meaning SIM cards in the case of mobile operators and subscriber numbers in the fixed network. Cases of 'reverse porting', where numbers are ported back to the issuing operator (for example after cancellation by a subscriber), are not considered porting. If a subscriber number is ported several times within a quarter ('subsequent porting'), this is counted separately each time.



## Mobile Services Price Index

### ➔ Stable mobile prices in Q1 2018



- Looking only at figures for Q1 2018, there has been relatively little movement in the mobile price index. Fluctuations in the overall index were minimal: at the end of March, the index was 0.5 percentage points higher than in December 2017.
- The figure for the year reveals a stronger downward trend, however: the price index in March 2018 was 4.7 percentage points lower than in March 2017. The key beneficiaries of this development have been medium- and high-volume users – i.e. the ‘average’ user categories – while prices for very low-volume and extremely high-volume (‘power’) user categories remain at roughly the same levels as seen last year.
- As every year, the basis for calculating the four user types was adjusted in the first quarter of 2018 but with the index linked accordingly, so that the adjustment has no impact on the price level as calculated. The underlying usage figures and further information on calculation methods can be found in the Glossary.

To calculate the index, the average monthly prices for four different user categories are derived from the rate information published each month by the Austrian Chamber of Labour. Three of the user categories refer to ‘smartphone users’ who make use of voice services, text messaging as well as data services. Users in the fourth category (‘low users’) exclusively use voice and text messaging services. For each category, the index is based on the five cheapest rates per brand (see Glossary). The baseline for calculations is January 2011, and the chart shows the changes over the past three years. In contrast to the other charts in the RTR Telekom Monitor, this chart shows price changes on a monthly and not a quarterly basis. Data are available up to March 2018 and are also included in the chart.

**TABLE 10: MOBILE PENETRATION**  
SEE PAGE 22

	Incl. M2M	Excl. M2M
Q1 2015	150.9%	149.1%
Q2 2015	151.2%	149.5%
Q3 2015	153.4%	151.6%
Q4 2015	154.8%	153.0%
Q1 2016	155.5%	153.8%
Q2 2016	155.1%	153.2%
Q3 2016	159.3%	153.8%
Q4 2016	162.6%	154.4%
Q1 2017	163.9%	154.1%
Q2 2017	166.3%	153.6%
Q3 2017	168.7%	153.1%
Q4 2017	169.3%	148.5%

**TABLE 11: RETAIL REVENUES FROM MOBILE TELECOMMUNICATIONS (IN EUR MILLIONS)**  
SEE PAGE 23

	Data-only subscriptions	Other subscriptions	Voice service connection fee	Bundled products and base fees	Other fees	Text message fee	Fees for data and value-added data services
Q1 2015			105	356	2	24	74
Q2 2015			107	353	2	24	79
Q3 2015			113	356	2	26	88
Q4 2015			107	358	2	24	81
Q1 2016			101	361	4	24	84
Q2 2016			109	365	3	25	82
Q3 2016			71	413	4	21	86
Q4 2016			65	417	5	20	85
Q1 2017			59	419	6	18	83
Q2 2017			58	414	5	18	86
Q3 2017			60	417	4	19	89
Q4 2017	152	444					

**TABLE 12: CALL MINUTES IN THE RETAIL MARKET (IN MILLIONS)**  
SEE PAGE 24

	Call minutes in the retail market (technical measurement)
Q1 2015	5,407
Q2 2015	5,319
Q3 2015	4,907
Q4 2015	5,220
Q1 2016	4,978
Q2 2016	5,033
Q3 2016	5,038
Q4 2016	5,339
Q1 2017	5,312
Q2 2017	5,237
Q3 2017	5,094
Q4 2017	5,488

**TABLE 13: TEXT MESSAGING (IN MILLIONS)**  
 SEE PAGE 25

	Text messages sent (technical measurement)
Q1 2015	975
Q2 2015	949
Q3 2015	857
Q4 2015	881
Q1 2016	772
Q2 2016	765
Q3 2016	732
Q4 2016	736
Q1 2017	663
Q2 2017	655
Q3 2017	607
Q4 2017	622

**TABLE 14: DATA VOLUME IN THE RETAIL MARKET (IN TERABYTE)**  
 SEE PAGE 26

	Total data volume	Data-only subscriptions	Other subscriptions
Q1 2015	59,100		
Q2 2015	64,800		
Q3 2015	76,200		
Q4 2015	99,200		
Q1 2016	109,900		
Q2 2016	124,500		
Q3 2016	142,900		
Q4 2016	194,200		
Q1 2017	223,100		
Q2 2017	235,200		
Q3 2017	266,800		
Q4 2017		238,300	72,100

**TABLE 15: SIM CARDS IN USE (IN THOUSANDS)**  
 SEE PAGE 27

	SIM cards	Data subscriptions	Other subscriptions
Q1 2015	12,980		
Q2 2015	13,040		
Q3 2015	13,280		
Q4 2015	13,470		
Q1 2016	13,570		
Q2 2016	13,550		
Q3 2016	13,950		
Q4 2016	14,260		
Q1 2017	14,390		
Q2 2017	14,630		
Q3 2017	14,880		
Q4 2017		4,080	10,860

**TABLE 16: MINUTES AND TEXTS PER MONTH PER SIM CARD**  
SEE PAGE 28

	Minutes / subscriber / month	Messages / subscriber / month
Q4 2017	168	19

**TABLE 17: TOTAL MOBILE REVENUES (IN EUR MILLIONS)**  
SEE PAGE 29

	Retail revenues	Wholesale revenues
Q1 2015	561	55
Q2 2015	565	58
Q3 2015	586	61
Q4 2015	572	59
Q1 2016	575	63
Q2 2016	584	61
Q3 2016	596	68
Q4 2016	591	60
Q1 2017	586	65
Q2 2017	580	63
Q3 2017	589	72
Q4 2017	596	73

**TABLE 18: PORTING OF MOBILE TELEPHONE NUMBERS**  
SEE PAGE 30

	Mobile number porting: no. of cases
Q1 2015	53,150
Q2 2015	48,890
Q3 2015	39,410
Q4 2015	51,590
Q1 2016	55,460
Q2 2016	47,650
Q3 2016	53,300
Q4 2016	68,640
Q1 2017	65,010
Q2 2017	65,520
Q3 2017	50,984
Q4 2017	66,120

**TABLE 19: MOBILE SERVICES PRICE INDEX (INDEX POINTS)**  
 SEE PAGE 31

	Low user	Medium user	High user	Power user	Overall index
March 2015	144.88	93.90	86.62	86.97	103.09
	152.14	94.10	85.95	77.75	102.49
June 2015	152.10	94.09	85.94	72.30	101.11
	142.32	90.21	83.22	68.11	95.97
	142.27	89.68	81.75	66.08	94.94
Sept. 2015	142.27	89.68	81.74	64.21	94.47
	140.18	88.58	80.97	63.94	93.42
	139.21	89.72	77.35	60.07	91.59
Dec. 2015	143.35	90.17	77.57	58.69	92.45
	141.17	87.61	74.34	54.63	89.44
	141.11	87.12	73.92	54.03	89.05
March 2016	140.45	87.86	74.55	55.35	89.55
	140.66	87.90	74.58	55.19	89.58
	140.09	87.30	74.07	54.47	88.98
June 2016	139.24	86.93	73.75	53.39	88.33
	139.59	89.83	76.22	53.81	89.86
	138.60	90.81	77.05	54.04	90.13
Sept. 2016	138.67	90.84	77.07	54.05	90.16
	138.44	90.78	77.02	51.03	89.32
	137.34	88.46	75.06	49.56	87.61
Dec. 2016	135.00	81.33	69.02	45.52	82.72
	133.63	80.44	68.26	45.03	81.84
	132.76	80.23	68.09	45.16	81.56
March 2017	130.81	81.27	69.18	41.74	80.75
	134.62	80.92	68.88	40.11	81.13
	135.62	81.31	69.21	39.07	81.30
June 2017	138.13	79.06	66.85	40.47	81.13
	137.10	74.22	62.77	40.12	78.55
	138.59	73.39	62.08	39.51	78.39
Sept. 2017	138.73	73.43	62.08	39.51	78.44
	134.37	70.93	61.69	38.10	76.27
	143.79	70.67	61.48	37.95	78.47
Dec. 2017	141.38	67.37	58.66	36.23	75.91
	141.37	67.33	58.63	36.39	75.93
	132.40	67.53	58.90	36.66	73.87
March 2018	135.25	68.26	59.47	38.68	75.41
	137.10	68.92	60.02	39.57	76.40



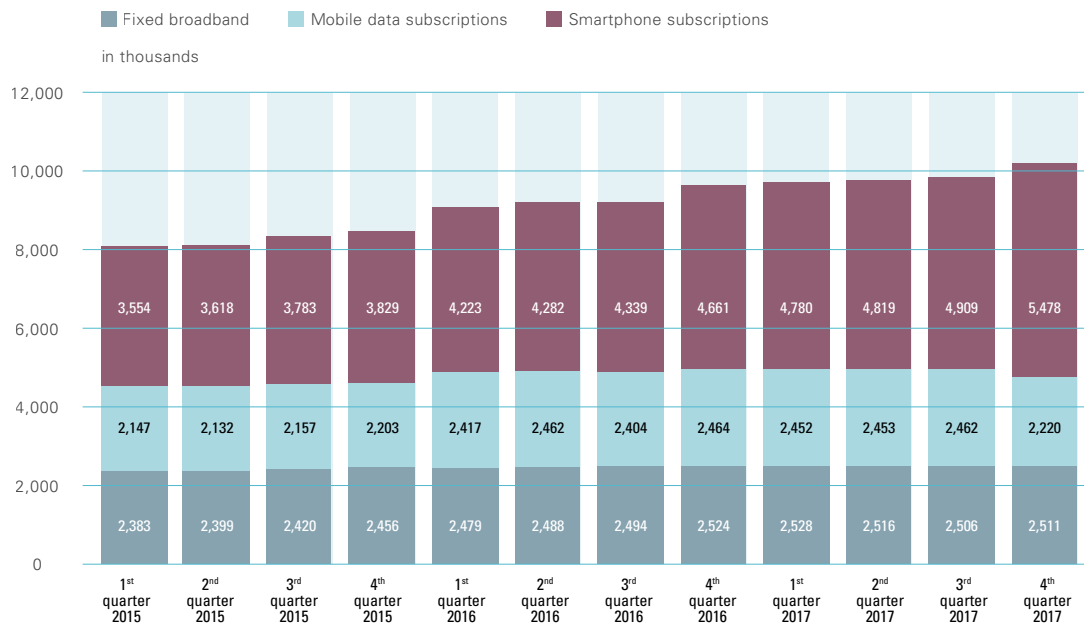
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# Broadband and bundled products

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	Retail broadband connections by bundle category – fixed network	40
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## Fixed and mobile broadband connections

### ➔ Significant growth in smartphone subscriptions



- Fixed and mobile broadband connections totalled 10.2 million at the end of 2017. This is a gain of 6.1% compared with 2016.
- Fixed broadband connections decreased slightly year-on-year by 0.5% to a total of 2.5 million connections.
- As a result of the changed query definition, a year-on-year comparison of the number of active mobile broadband connections is not possible (from Q4 2017, mobile broadband connections are now counted only if used for internet access at least once in the quarter). These totalled 2.26 million at the end of 2017.
- In contrast, the number of smartphone subscriptions rose sharply. This can also perhaps be attributed to changes in category assignments on the part of operators. Compared with the end of 2016, subscriptions rose by 17.3% to total 5.5 million.

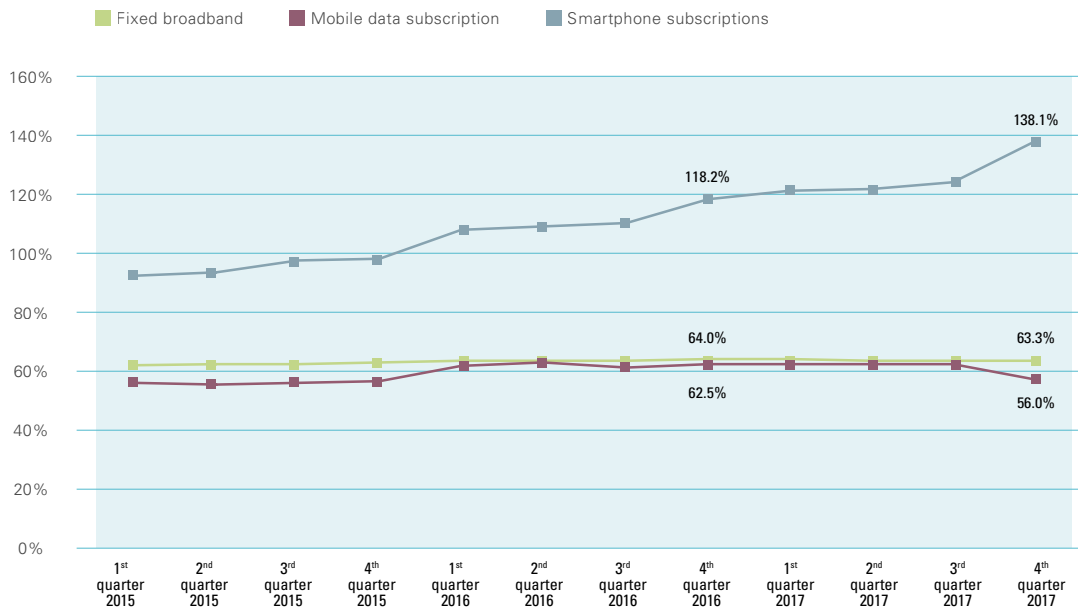
The chart above shows the total number of fixed and mobile broadband connections. With mobile broadband, a distinction is made between mobile data and smartphone subscriptions.

For the definitions of fixed broadband connections as well as mobile data and smartphone subscriptions, refer to the Glossary.



## Broadband penetration

➔ 1.4 smartphone subscriptions per household



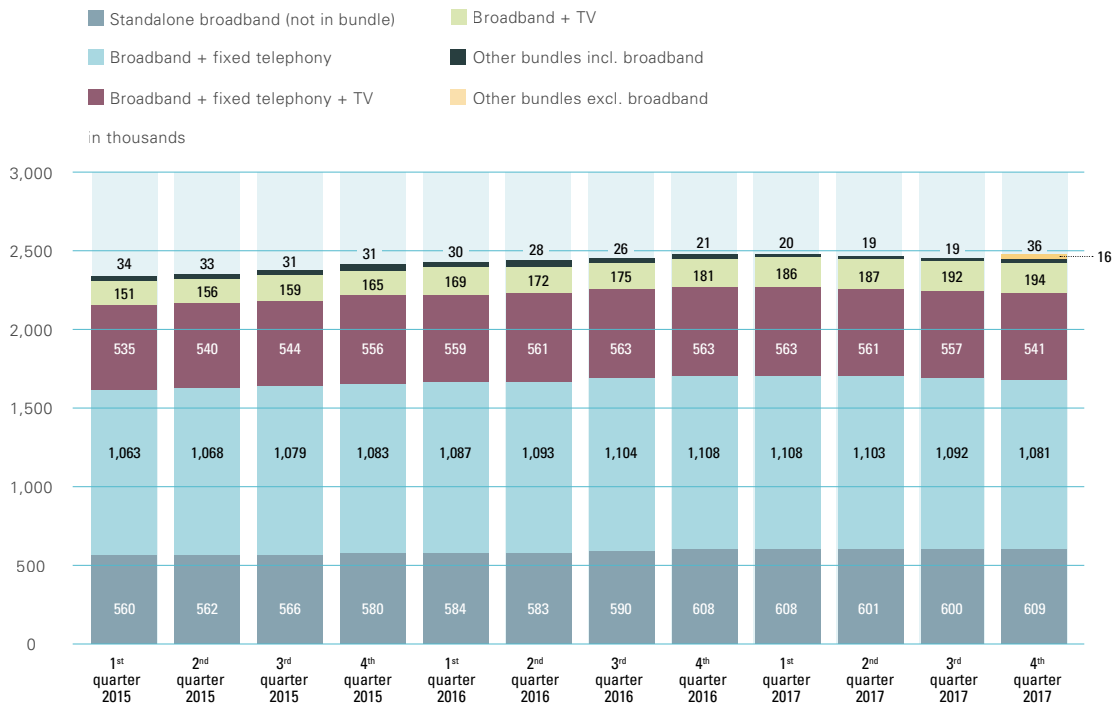
Source for number of households: Statistics Austria

- The effects of the changes to definitions made in mobile broadband categories mentioned on the previous page are clearly reflected in the penetration rates.
- The household penetration rate for fixed broadband languished at about 63% (last figure 63.3%), with mobile broadband at 56.0% at the end of 2017.
- The rate for smartphone subscriptions added substantially to an already high figure, with 138.1% of households having such plans at the end of 2017. As stated, this figure may be a result of changes to provider categories in the amended query.

Broadband penetration refers to the ratio of fixed and mobile broadband connections to the total number of households in Austria.

## Retail broadband connections by bundle category – fixed network

➔ Broadband connections still often combined with fixed network telephony

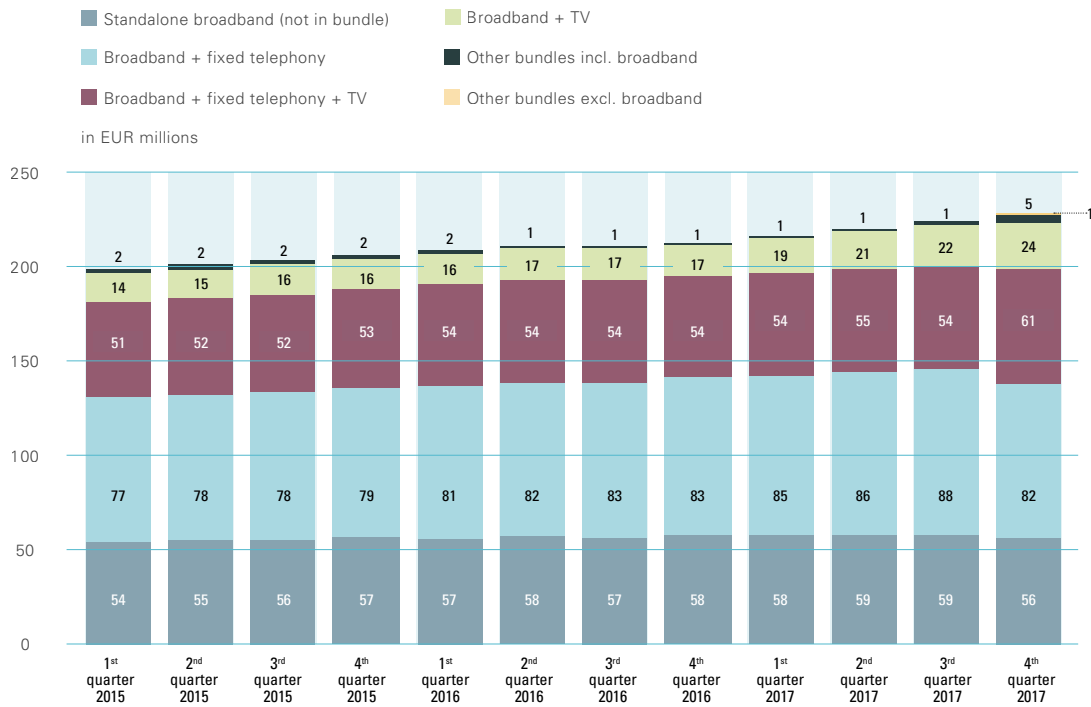


- Broadband plus fixed network is the commonest broadband bundle (43.7%), followed by standalone broadband (24.6%), and broadband plus fixed network and TV (21.8%).
- From Q4 2017, data is now also collected on bundles not combined with fixed broadband but instead offered with other telecoms services (e.g. TV and mobile services or fixed network telephony and TV). There were some 16,000 such bundles at the end of 2017.

The chart shows the number of broadband products sold to retail customers, where the products are based on the provider's own infrastructure or an unbundled line and not on additionally purchased infrastructure. Broadband products may be fixed broadband products sold without any other product ('standalone') or can be a combination of fixed broadband with one or more other products (bundled product). From Q4 2017, figures for bundled products without fixed network broadband are also presented.

## Revenues for bundled products

### Revenue upswing for bundled products



- In 2017, broadband bundles generated EUR 660 million, with standalone broadband accounting for EUR 232 million. Overall, this marks a rise of 5.4% compared with 2016.
- The biggest gains were made by the broadband plus TV category (+28.8%), while revenues for standalone products showed year-on-year growth of just 1.2%.

The chart shows the revenues from broadband access sold to retail customers, where the connection was based on the provider's own infrastructure or an unbundled line. This includes broadband standalone products and bundled products, the latter referring to broadband offered in combination with another product (voice telephony and/or TV and/or other products). From Q4 2017, revenues from bundled products without fixed network broadband are also presented.

**TABLE 20: FIXED AND MOBILE BROADBAND CONNECTIONS (IN THOUSANDS)**  
SEE PAGE 38

	Fixed broadband	Mobile data subscriptions	Smartphone subscriptions
Q1 2015	2,383	2,147	3,554
Q2 2015	2,399	2,132	3,618
Q3 2015	2,420	2,157	3,783
Q4 2015	2,456	2,203	3,829
Q1 2016	2,479	2,417	4,223
Q2 2016	2,488	2,462	4,282
Q3 2016	2,494	2,404	4,339
Q4 2016	2,524	2,464	4,661
Q1 2017	2,528	2,452	4,780
Q2 2017	2,516	2,453	4,819
Q3 2017	2,506	2,462	4,909
Q4 2017	2,511	2,220	5,478

**TABLE 21: BROADBAND PENETRATION**  
SEE PAGE 39

	Fixed broadband	Mobile data subscription	Smartphone subscriptions
Q1 2015	61.9%	55.7%	92.3%
Q2 2015	62.2%	55.2%	93.7%
Q3 2015	62.4%	55.6%	97.6%
Q4 2015	62.8%	56.3%	97.9%
Q1 2016	63.2%	61.6%	107.7%
Q2 2016	63.3%	62.7%	109.0%
Q3 2016	63.3%	61.0%	110.2%
Q4 2016	64.0%	62.5%	118.2%
Q1 2017	64.0%	62.1%	121.1%
Q2 2017	63.6%	62.1%	121.9%
Q3 2017	63.3%	62.1%	123.9%
Q4 2017	63.3%	56.0%	138.1%

**TABLE 22: RETAIL BROADBAND CONNECTIONS BY BUNDLE CATEGORY – FIXED NETWORK (IN THOUSANDS)**  
SEE PAGE 40

	Standalone broadband (not in bundle)	Broadband + fixed telephony	Broadband + fixed telephony + TV	Broadband + TV	Other bundles incl. broadband	Other bundles excl. broadband
Q1 2015	560	1,063	535	151	34	
Q2 2015	562	1,068	540	156	33	
Q3 2015	566	1,079	544	159	31	
Q4 2015	580	1,083	556	165	31	
Q1 2016	584	1,087	559	169	30	
Q2 2016	583	1,093	561	172	28	
Q3 2016	590	1,104	563	175	26	
Q4 2016	608	1,108	563	181	21	
Q1 2017	608	1,108	563	186	20	
Q2 2017	601	1,103	561	187	19	
Q3 2017	600	1,092	557	192	19	
Q4 2017	609	1,081	541	194	36	16

**TABLE 23: REVENUES FOR BUNDLED PRODUCTS (IN EUR MILLIONS)**  
 SEE PAGE 41

	Standalone broadband (not in bundle)	Broadband + fixed telephony	Broadband + fixed telephony + TV	Broadband + TV	Other bundles incl. broadband	Other bundles excl. broadband
Q1 2015	54	77	51	14	2	
Q2 2015	55	78	52	15	2	
Q3 2015	56	78	52	16	2	
Q4 2015	57	79	53	16	2	
Q1 2016	57	81	54	16	2	
Q2 2016	58	82	54	17	1	
Q3 2016	57	83	54	17	1	
Q4 2016	58	83	54	17	1	
Q1 2017	58	85	54	19	1	
Q2 2017	59	86	55	21	1	
Q3 2017	59	88	54	22	1	
Q4 2017	56	82	61	24	5	1



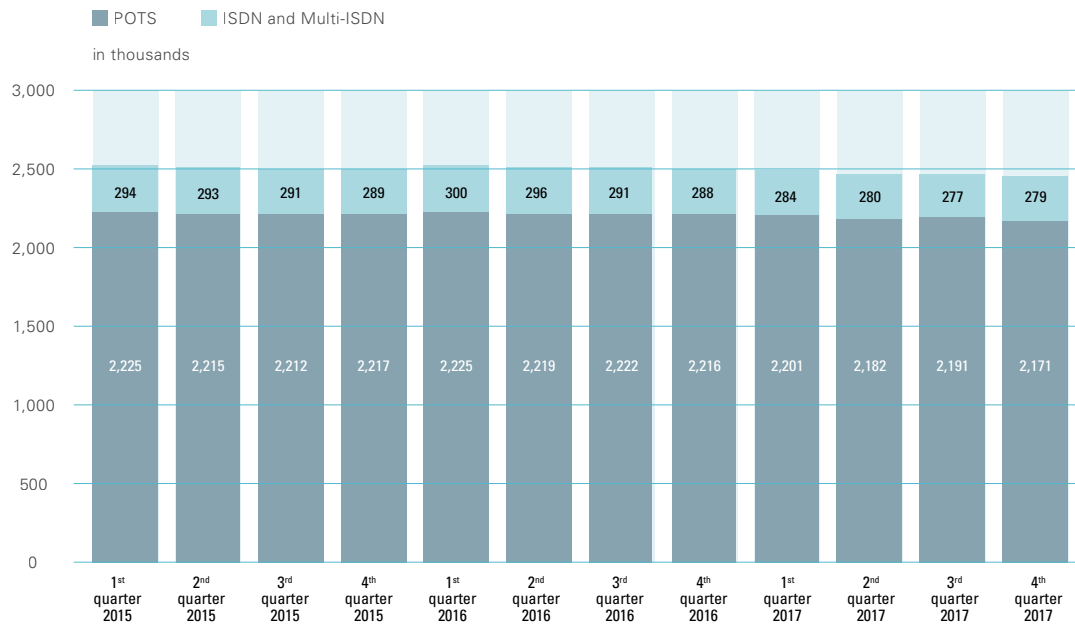
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# Fixed network

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## Fixed lines

➔ Downward trend continues for fixed lines



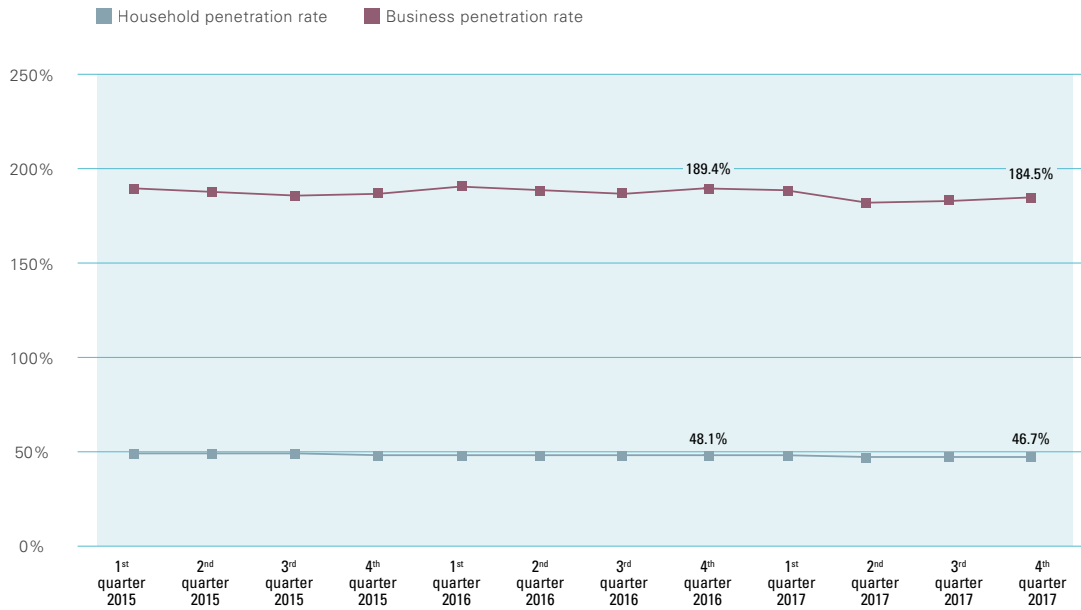
- Fixed network connections totalled 2.4 million at the end of 2017. This represents a decline of 2.2% since the end of 2016. Of these, around 846,000 (some 34.5%) were VoB connections.

The chart presents the total number of fixed lines, broken down by infrastructure. Figures include voice-over-broadband connections (see Glossary).



## Fixed-line penetration

### ➔ Penetration rates stable



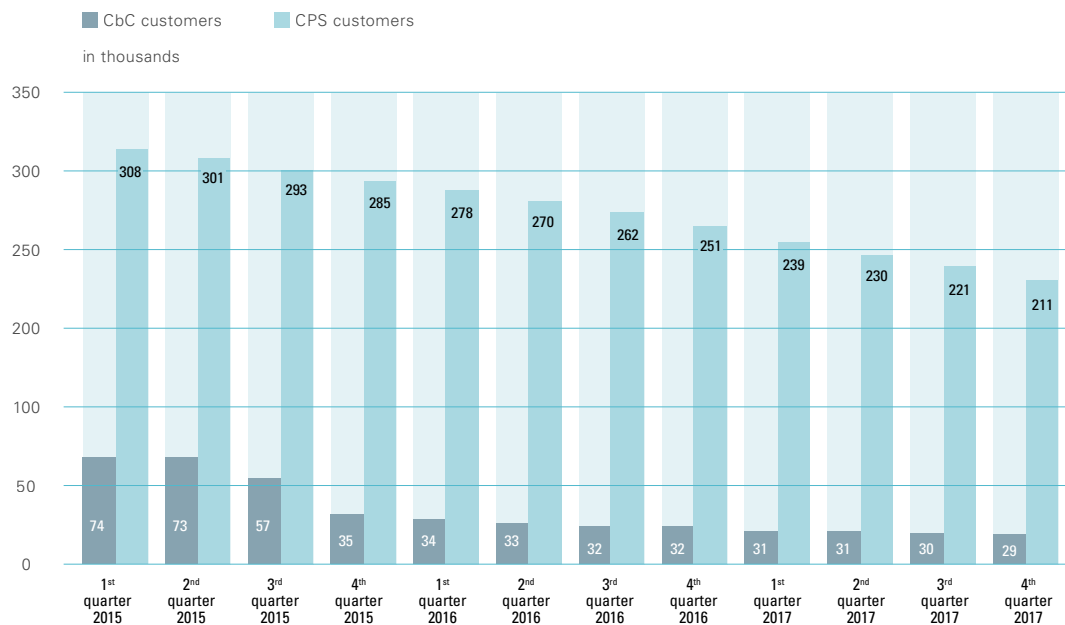
Source for number of households and businesses: Statistics Austria

- Penetration rates for households and businesses remained virtually unchanged. At the end of 2017, the penetration rate for fixed lines was 184.5% for businesses and 46.7% for households. This equates to a slight decline in penetration rates since the end of 2016.

The chart shows fixed-line penetration rates among households and businesses. The higher penetration rate for businesses is due to the fact that a business usually has a greater number of fixed lines than a household, so that the figures are not directly comparable.

## Carrier pre-selection and call-by-call usage

### ➔ Continuing decline of CPS and CbC

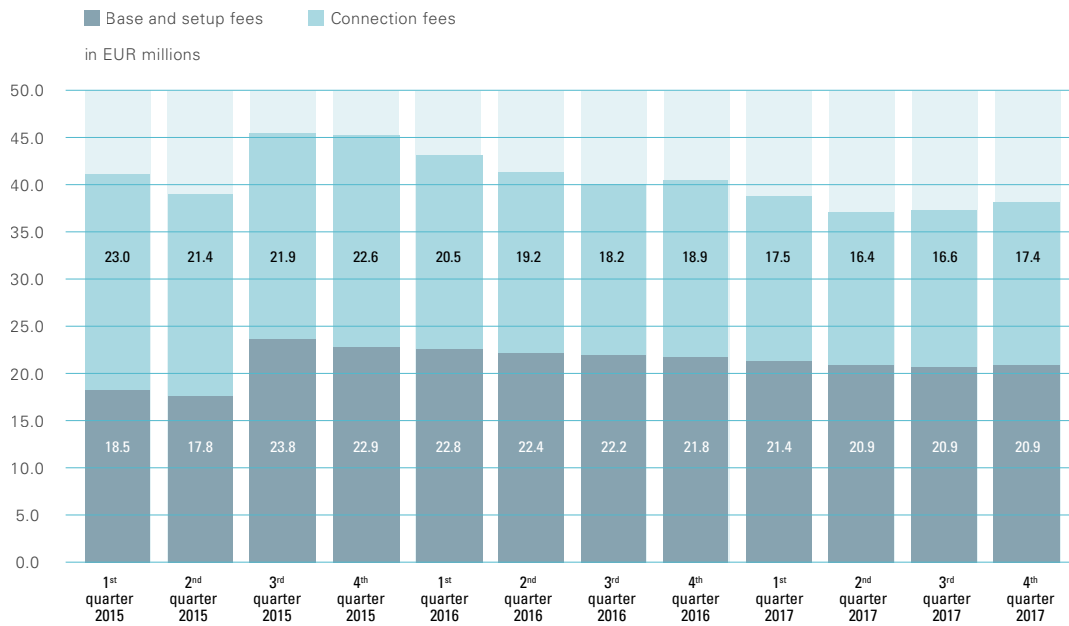


- CPS and CbC lines continue to lose importance over time.
- At the end of 2017, there were some 211,100 CPS lines in Austria (15.8% less than at the end of 2016). CbC lines show a similar pattern: 29,000 lines represents a decline of 8.8% from the end of 2016.

The chart shows the number of customers with lines on which carrier pre-selection (CPS) is used and the number of call-by-call (CbC) customers who used call-by-call at least once in each quarter (see Glossary).

## Fixed retail revenues in the private customer segment

➔ Revenues decline year-on-year in private customer segment

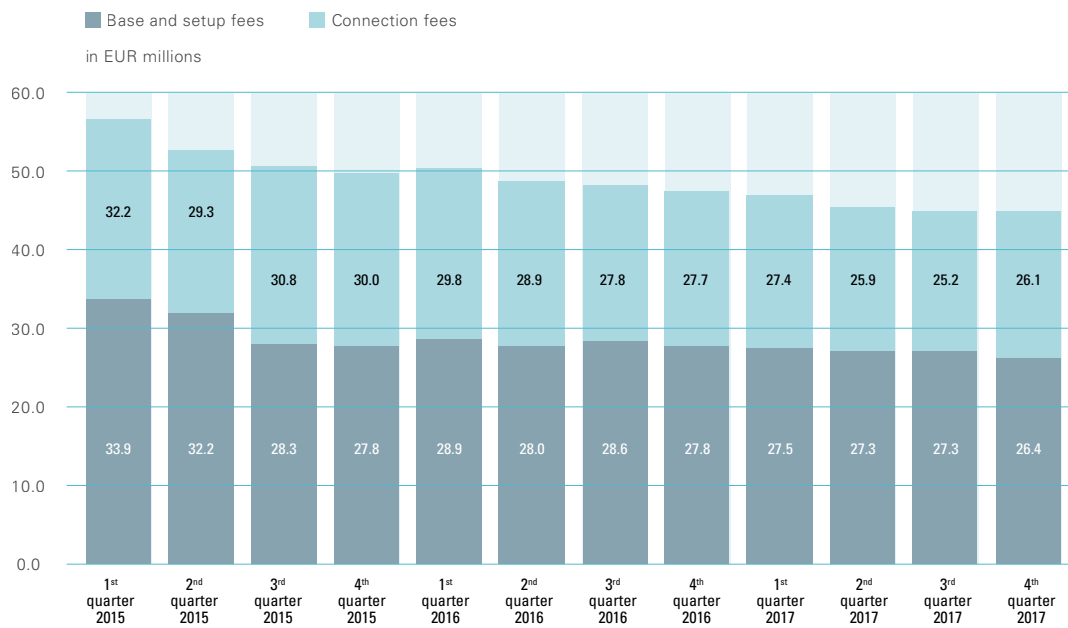


- In 2017, the private customer segment generated some EUR 152.0 million with fixed network telephony. This contrasts with EUR 165.8 million in 2016. Revenues in the private customer segment therefore fell by 8.3% in a single year.
- This figure excludes revenues (basic monthly fees) generated as part of broadband bundles.

The chart shows revenues from fixed network voice telephony in the private customer segment (see Glossary). Figures are broken down into basic monthly fees, setup fees and connection fees (see Glossary).

## Fixed retail revenues in the business customer segment

➔ Decline in business customer revenues

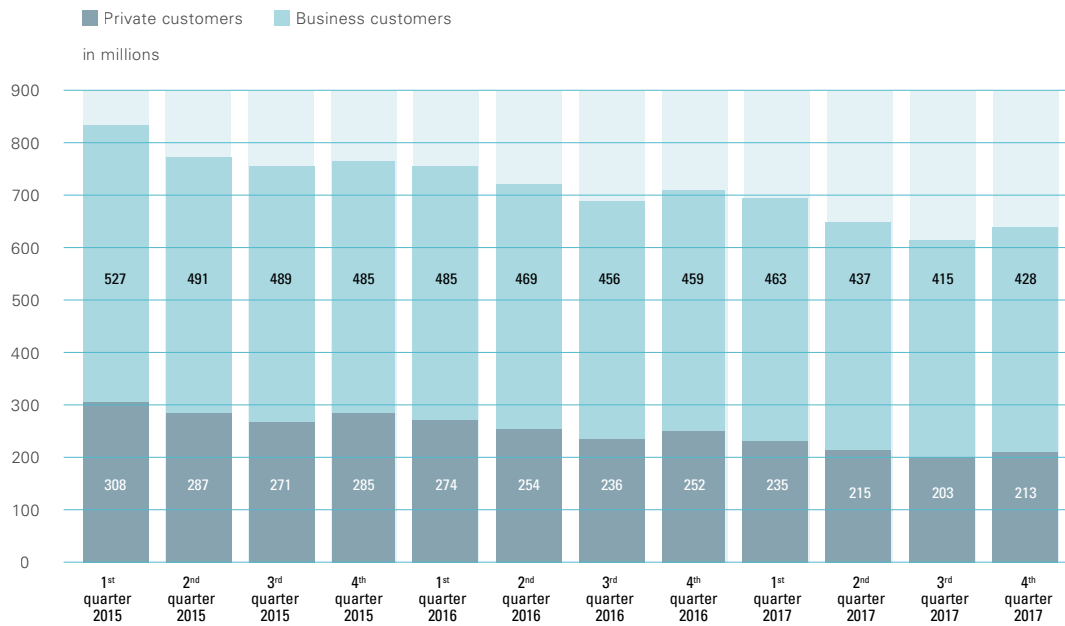


- Mirroring the private customer segment, revenues from business are also declining. Contrasting with EUR 227.4 million in 2016, 2017 revenues were only around EUR 213.1 million (-6.3%).
- Revenues (basic monthly fees) generated by broadband bundles are not included.

The chart shows revenues from fixed network voice telephony in the business customer segment (see Glossary). Figures are broken down into basic monthly fees, setup fees and connection fees (see Glossary).

## Call minutes in the retail market

➔ Significantly fewer call minutes from the fixed network than in 2016

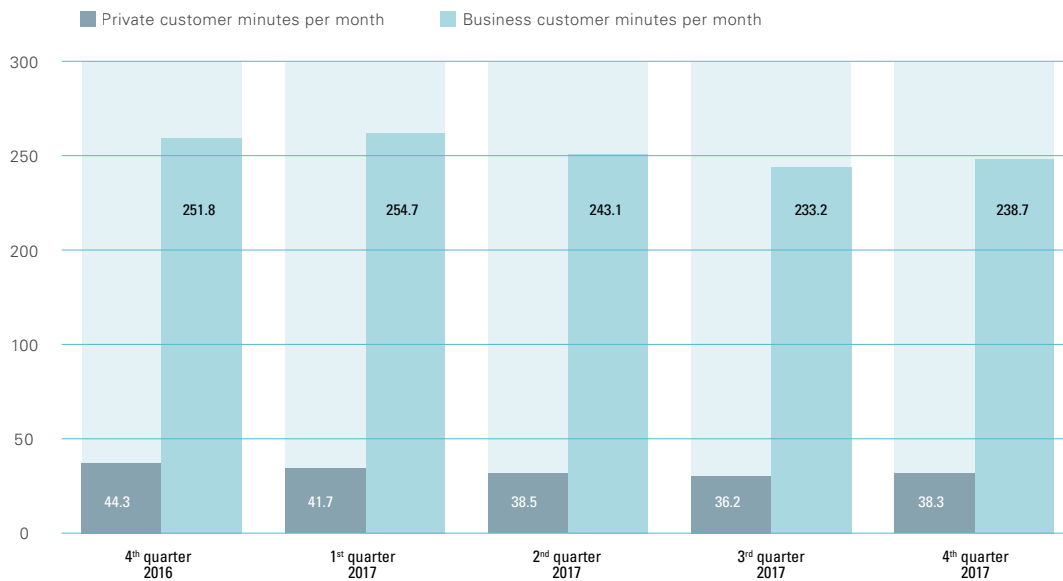


- The situation suggested by the decline in connection fees is thrown into sharp relief by call minutes. Fixed network telephony is used less and less each year. In 2017 fixed network calls totalled around 2.609 billion minutes. Compared with 2016 (2.885 billion minutes), this is a drop of 9.6%.
- The decline in the private customer segment is more pronounced than for business customers (-14.7% versus -6.8%).
- As before, business customers generate a significantly higher call volume than private customers. In 2017, the proportion of call minutes placed by business customers was around 66.7%.

The chart above shows the number of real minutes (see Glossary) in the fixed network, broken down by private and business customer segments.

## Average call minutes from fixed network telephony

➔ Downswing in call minutes per connection

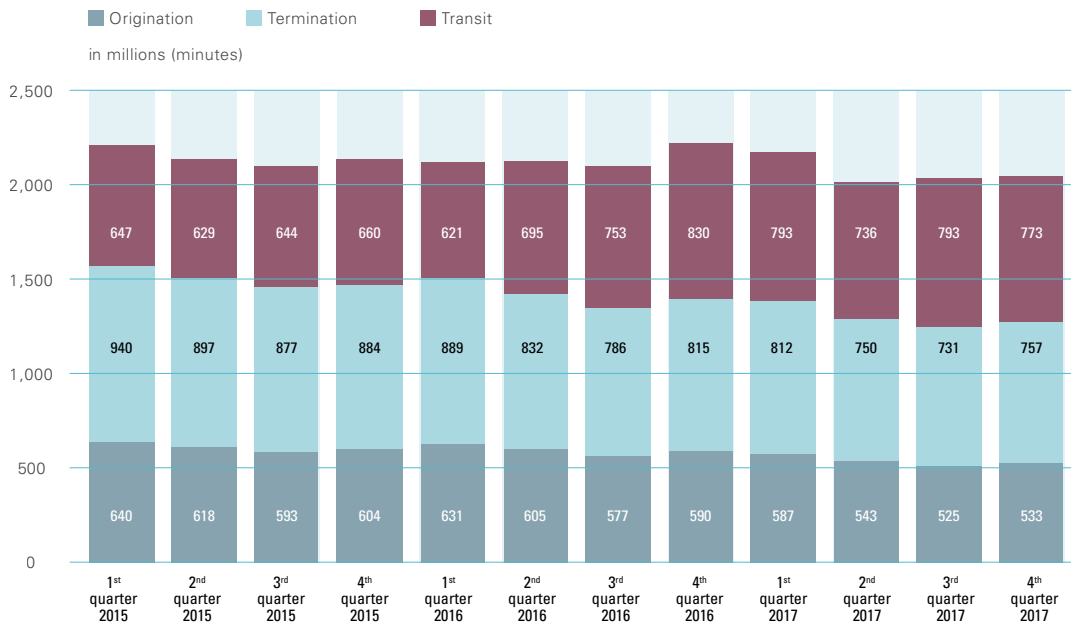


- Business customers placed an average of some 238.7 call minutes per month in Q4 2017. In a year-on-year comparison with 2016, this equates to a decline of 13.1 minutes per month.
- This decline was mirrored by the private customer segment's figure of 38.3 minutes per month – some 5.9 minutes fewer than in the prior-year period.

The chart shows for each quarter the average number of active call minutes (real minutes) in the fixed network, per head and month in the business and private segments. The monthly values are calculated as a third of the call minutes divided by the total number of fixed network lines in the respective quarter.

## Minutes in the wholesale market

➔ Slight gain in transit but origination and termination losing ground

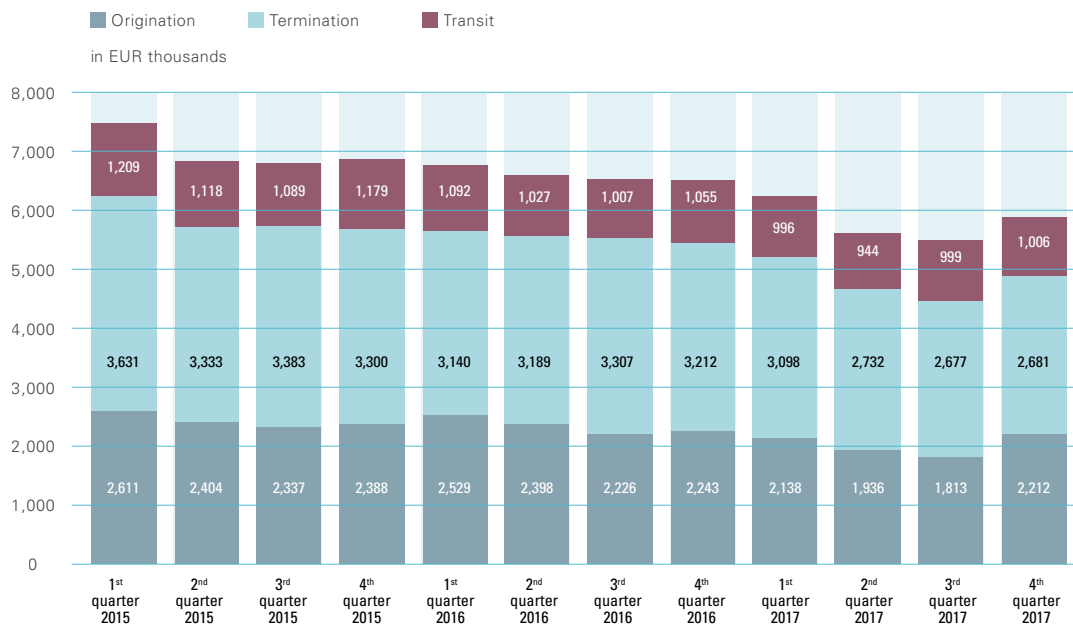


- Wholesale minutes totalled 8.333 billion in 2017. This represents a decline of 3.4% compared with 2016.
- Losses were recorded for origination minutes (-8.9% to 2.188 billion) and termination minutes (-8.2% to 3.050 billion).
- In contrast, transit minutes increased by 6.7%, rising to 3.095 billion.

With wholesale services in fixed network voice telephony, a distinction is made among three sub-services: origination, termination and transit services (see Glossary). Wholesale minutes are shown in the chart.

## Wholesale revenues

➔ Wholesale revenues decline year-on-year



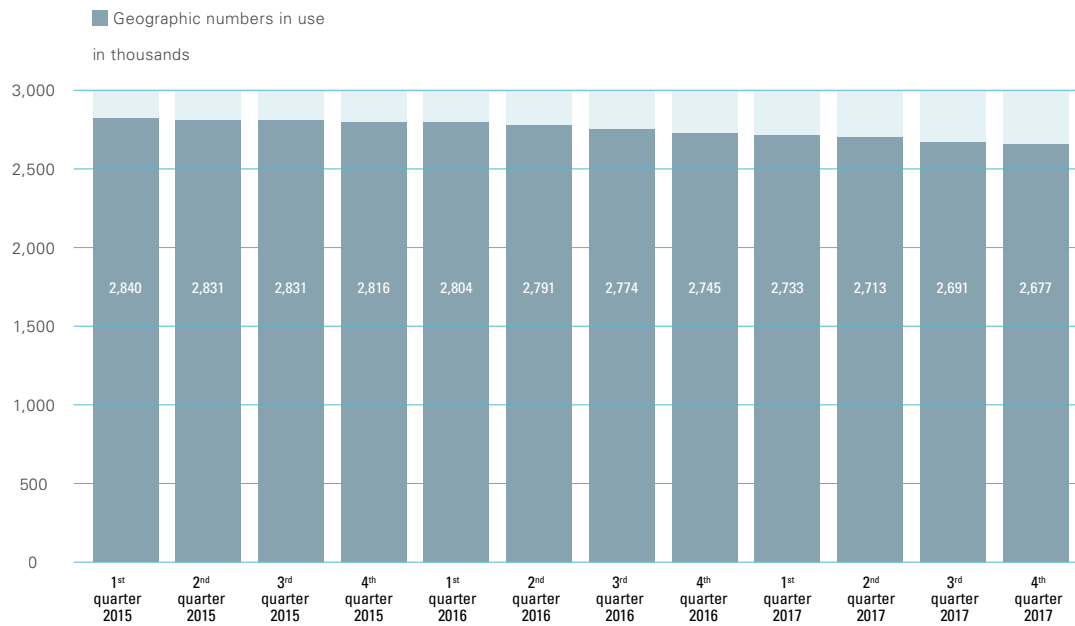
- In 2017, wholesale revenues totalled around EUR 23.2 million. This is a substantial decline (-12.1%) compared with 2016.
- The decline affected revenues from origination (-13.8%), termination (-12.9%) as well as transit (-5.6%).

In line with wholesale minutes, wholesale revenues are shown for origination, termination and transit services.



## Geographic numbers in use

➔ Geographic numbers in use: continued steady decline



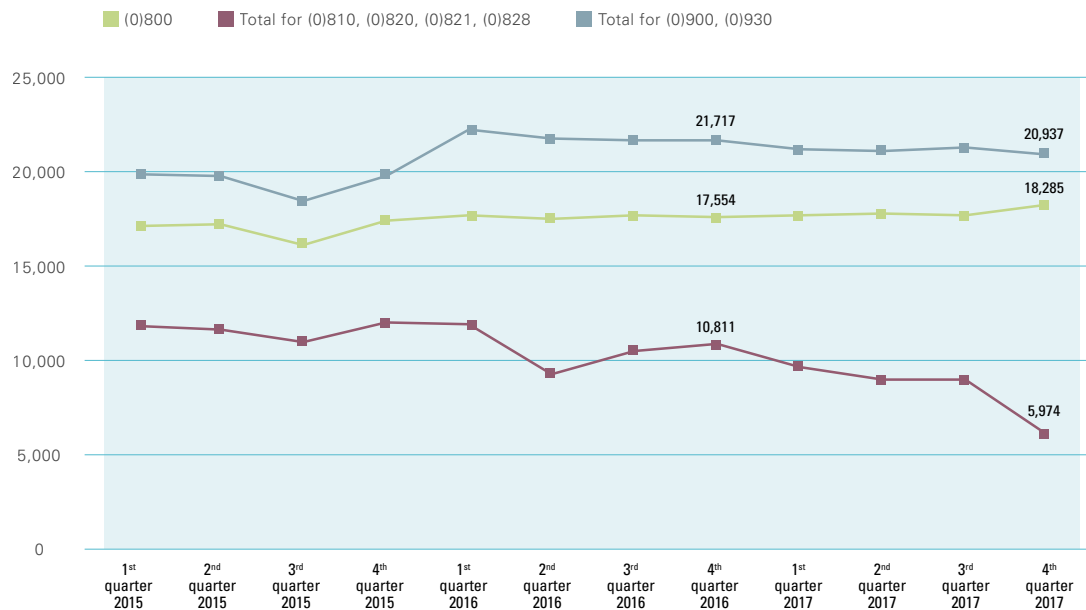
- The number of geographic numbers in use continues to fall slowly but steadily over time.
- At the end of 2017, some 2.7 million geographic numbers were registered, 2.5% fewer than a year before.

Geographic numbers are domestic telephone numbers prefixed by a local area code (01 in the case of Vienna).

As more than one number may be assigned to a single line, the number of geographic phone numbers is not identical to the number of fixed subscriber lines.

## Service numbers in use

➔ Sharp decline in number ranges (0)810, (0)820 and (0)9xx



- Compared with the end of the previous year, the number of premium rate (0)900 and (0)930 numbers fell by 3.6% to 20,937.
- The number of (0)800 numbers rose by 4.2% to 18,285 over the year.
- A steep decline (-44.7% to 5,974 numbers) was seen in the (0)810, (0)820, (0)821 and (0)828 number ranges. One reason for this fall is a judgement handed down by the European Court of Justice (ECJ) that prohibits the use of (0)810, (0)820 and (0)9xx numbers for customer hotlines.

The chart above shows the number of service numbers in use in the following ranges:

- (0)800 range: toll-free services
- (0)810 range: max. EUR 0.10 per minute or text message
- (0)820 range: max. EUR 0.20 per minute or text message
- (0)821 range: max. EUR 0.20 per call or text message
- (0)828 range: text messages only; standard charges apply
- (0)900 range: max. EUR 3.64 per minute or max. EUR 10.00 per text message
- (0)930 range: max. EUR 3.64 per minute or max. EUR 10.00 per text message (erotic services)

**TABLE 24: FIXED LINES (IN THOUSANDS)**  
 SEE PAGE 46

	POTS	ISDN and Multi-ISDN
Q1 2015	2,225	294
Q2 2015	2,215	293
Q3 2015	2,212	291
Q4 2015	2,217	289
Q1 2016	2,225	300
Q2 2016	2,219	296
Q3 2016	2,222	291
Q4 2016	2,216	288
Q1 2017	2,201	284
Q2 2017	2,182	280
Q3 2017	2,191	277
Q4 2017	2,171	279

**TABLE 25: FIXED-LINE PENETRATION**  
 SEE PAGE 47

	Household penetration rate	Business penetration rate
Q1 2015	49.3%	189.3%
Q2 2015	49.0%	187.9%
Q3 2015	48.8%	186.1%
Q4 2015	48.4%	186.7%
Q1 2016	48.4%	190.9%
Q2 2016	48.3%	189.0%
Q3 2016	48.3%	186.8%
Q4 2016	48.1%	189.4%
Q1 2017	47.6%	188.7%
Q2 2017	47.2%	182.2%
Q3 2017	47.3%	183.3%
Q4 2017	46.7%	184.5%

**TABLE 26: CARRIER PRE-SELECTION AND CALL-BY-CALL USAGE (IN THOUSANDS)**  
 SEE PAGE 48

	CbC customers	CPS customers
Q1 2015	74	308
Q2 2015	73	301
Q3 2015	57	293
Q4 2015	35	285
Q1 2016	34	278
Q2 2016	33	270
Q3 2016	32	262
Q4 2016	32	251
Q1 2017	31	239
Q2 2017	31	230
Q3 2017	30	221
Q4 2017	29	211

**TABLE 27: FIXED RETAIL REVENUES IN THE PRIVATE CUSTOMER SEGMENT (IN EUR MILLIONS)**  
SEE PAGE 49

	Base and setup fees	Connection fees
Q1 2015	18.5	23.0
Q2 2015	17.8	21.4
Q3 2015	23.8	21.9
Q4 2015	22.9	22.6
Q1 2016	22.8	20.5
Q2 2016	22.4	19.2
Q3 2016	22.2	18.2
Q4 2016	21.8	18.9
Q1 2017	21.4	17.5
Q2 2017	20.9	16.4
Q3 2017	20.9	16.6
Q4 2017	20.9	17.4

**TABLE 28: FIXED RETAIL REVENUES IN THE BUSINESS CUSTOMER SEGMENT (IN EUR MILLIONS)**  
SEE PAGE 50

	Base and setup fees	Connection fees
Q1 2015	33.9	32.2
Q2 2015	32.2	29.3
Q3 2015	28.3	30.8
Q4 2015	27.8	30.0
Q1 2016	28.9	29.8
Q2 2016	28.0	28.9
Q3 2016	28.6	27.8
Q4 2016	27.8	27.7
Q1 2017	27.5	27.4
Q2 2017	27.3	25.9
Q3 2017	27.3	25.2
Q4 2017	26.4	26.1

**TABLE 29: CALL MINUTES IN THE RETAIL MARKET (IN MILLIONS)**  
SEE PAGE 51

	Private customers	Business customers
Q1 2015	308.4	526.9
Q2 2015	286.6	491.1
Q3 2015	270.8	488.6
Q4 2015	285.4	484.5
Q1 2016	274.3	484.6
Q2 2016	254.0	469.1
Q3 2016	236.2	455.9
Q4 2016	251.7	459.4
Q1 2017	234.9	463.1
Q2 2017	215.2	436.5
Q3 2017	203.4	414.9
Q4 2017	213.1	427.5

**TABLE 30: AVERAGE CALL MINUTES FROM FIXED NETWORK TELEPHONY**  
 SEE PAGE 52

	Private customer minutes per month	Business customer minutes per month
Q4 2016	44.3	251.8
Q1 2017	41.7	254.7
Q2 2017	38.5	243.1
Q3 2017	36.2	233.2
Q4 2017	38.3	238.7

**TABLE 31: MINUTES IN THE WHOLESALE MARKET (IN MILLIONS - MINUTES)**  
 SEE PAGE 53

	Origination	Termination	Transit
Q1 2015	640	940	647
Q2 2015	618	897	629
Q3 2015	593	877	644
Q4 2015	604	884	660
Q1 2016	631	889	621
Q2 2016	605	832	695
Q3 2016	577	786	753
Q4 2016	590	815	830
Q1 2017	587	812	793
Q2 2017	543	750	736
Q3 2017	525	731	793
Q4 2017	533	757	773

**TABLE 32: WHOLESALE REVENUES (IN EUR THOUSANDS)**  
 SEE PAGE 54

	Origination	Termination	Transit
Q1 2015	2,611	3,631	1,209
Q2 2015	2,404	3,333	1,118
Q3 2015	2,337	3,383	1,089
Q4 2015	2,388	3,300	1,179
Q1 2016	2,529	3,140	1,092
Q2 2016	2,398	3,189	1,027
Q3 2016	2,226	3,307	1,007
Q4 2016	2,243	3,212	1,055
Q1 2017	2,138	3,098	996
Q2 2017	1,936	2,732	944
Q3 2017	1,813	2,677	999
Q4 2017	2,212	2,681	1,006

**TABLE 33: GEOGRAPHIC NUMBERS IN USE (IN THOUSANDS)**  
SEE PAGE 55

	Geographic numbers in use
Q1 2015	2,840
Q2 2015	2,831
Q3 2015	2,831
Q4 2015	2,816
Q1 2016	2,804
Q2 2016	2,791
Q3 2016	2,774
Q4 2016	2,745
Q1 2017	2,733
Q2 2017	2,713
Q3 2017	2,691
Q4 2017	2,677

**TABLE 34: SERVICE NUMBERS IN USE**  
SEE PAGE 56

	(0)800	Total for (0)810, (0)820, (0)821, (0)828	Total for (0)900, (0)930
Q1 2015	17,088	11,784	19,832
Q2 2015	17,184	11,657	19,762
Q3 2015	16,114	10,936	18,436
Q4 2015	17,406	11,957	19,765
Q1 2016	17,651	11,864	22,208
Q2 2016	17,540	9,261	21,803
Q3 2016	17,653	10,511	21,710
Q4 2016	17,554	10,811	21,717
Q1 2017	17,673	9,606	21,213
Q2 2017	17,813	8,987	21,148
Q3 2017	17,732	8,984	21,270
Q4 2017	18,285	5,974	20,937





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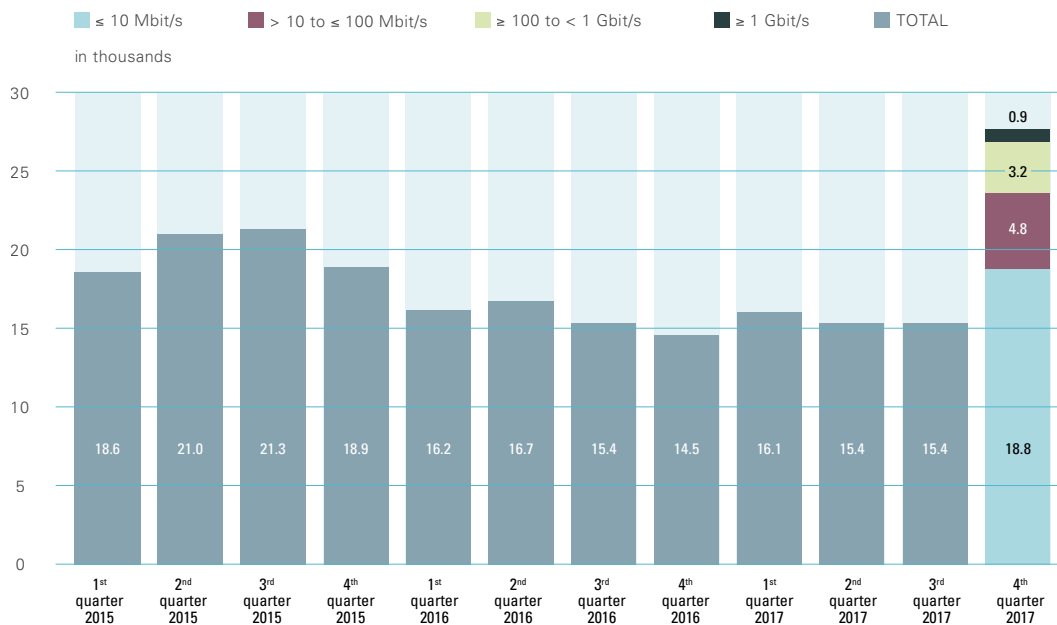


# Leased lines

5	Leased lines	63
	Number of retail leased lines and Ethernet services	64
	Revenues from retail leased lines and Ethernet services	65
	Number of terminating segments	66
	Wholesale revenues from leased lines and Ethernet services	67
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## Number of retail leased lines and Ethernet services

➔ Retail leased lines now total around 28,000

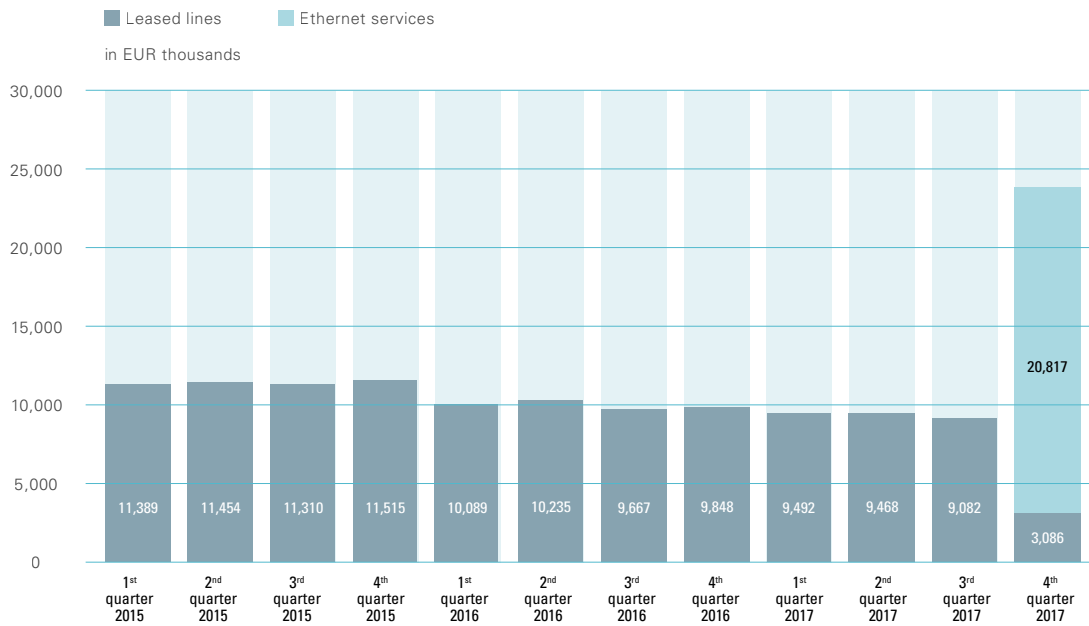


- At the end of 2017, there were 27,700 leased lines and Ethernet services in the retail segment (i.e. not acquired by other telecommunications network operators).
- Most of these (66.4%) were assignable to bandwidth categories of under 10 Mbps. A further 4,700 (17%) supported bandwidths from 10 to 100 Mbps. Almost as many lines (16.6%) provide bandwidths of 100 Mbps or higher.
- The increase in Q4 2017 can be ascribed to the fact that Ethernet services are now also queried in addition to retail leased lines. This means a year-on-year comparison is not possible.

The chart shows the number of retail leased lines and (from Q4 2017 onwards) retail lines used for Ethernet services (see Glossary).

## Revenues from retail leased lines and Ethernet services

➔ Revenues of around EUR 21 million from Ethernet services in Q4 2017

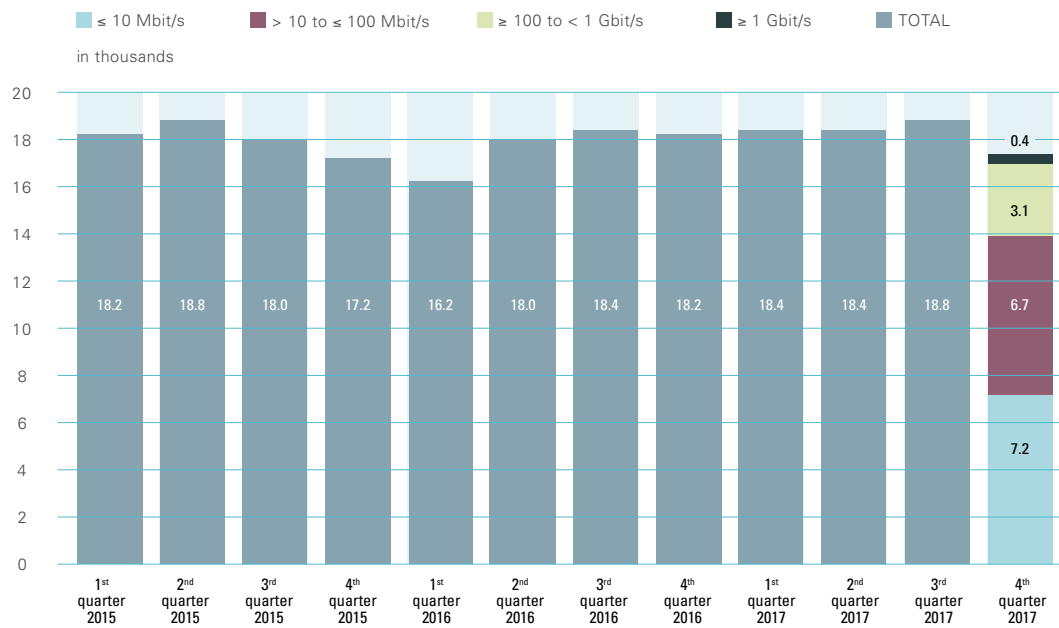


- In Q4 2017, revenues of around EUR 23.9 million were generated from leased lines and Ethernet services in the retail segment (i.e. not from other telecommunications network operators). Most of this volume (87.1%) was generated by Ethernet services (or leased lines with Ethernet interfaces).
- A year-on-year comparison is not possible, since Ethernet services are now queried but were not included before Q4 2017.

The chart presents revenues from retail leased lines and – from Q4 2017 onwards – from retail Ethernet services (see Glossary). In addition, a change has also been made to the demarcation between leased lines and Ethernet services: from Q4 2017, leased lines with consumer-side Ethernet interfaces are no longer recorded under 'leased lines' but are included in 'Ethernet services'.

## Number of terminating segments

→ Q4 2017 reveals decline in terminating segments

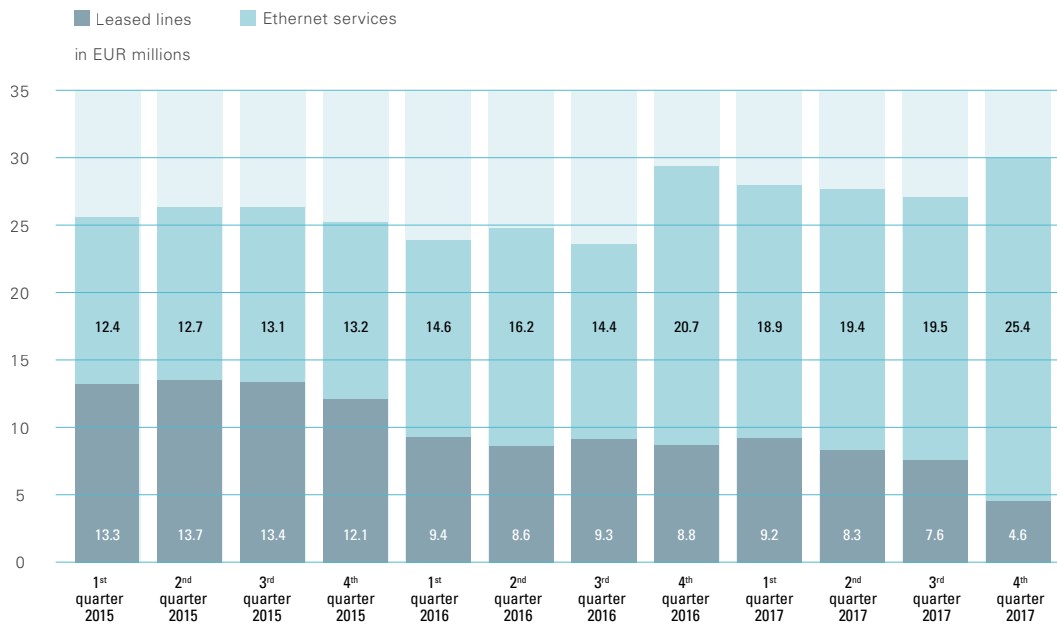


- The number of terminating segments reported by operators fell significantly between Q3 and Q4 2017 (from 18,800 to 17,400).
- Some 79.9% of these terminating segments have bandwidths of up to 100 Mbps.

The chart shows the number of terminating segments (see Glossary) for leased lines and Ethernet services (wholesale market).

## Wholesale revenues from leased lines and Ethernet services

➔ Increase during last quarter of 2017



- In 2017 wholesale revenues for terminating segments and trunk segments totalled around EUR 113 million. This represents a gain of 10.9% compared with the previous year.
- While leased line revenues dropped by 17.1% (to EUR 29.9 million), Ethernet revenues increased by 26.2% (to EUR 83.2 million).

The chart presents revenues from trunk segments and terminating segments (leased lines and Ethernet services – see Glossary). These revenues consist of sources such as one-off fees and regular fees (including project business).

From Q4 2017, Ethernet interfaces are no longer recorded with leased lines but are included in Ethernet services.

**TABLE 35: NUMBER OF RETAIL LEASED LINES AND ETHERNET SERVICES**  
(IN THOUSANDS) SEE PAGE 64

	≤ 10 Mbit/s	> 10 to ≤ 100 Mbit/s	≥ 100 to < 1 Gbit/s	≥ 1 Gbit/s	TOTAL
Q1 2015					18.6
Q2 2015					21.0
Q3 2015					21.3
Q4 2015					18.9
Q1 2016					16.2
Q2 2016					16.7
Q3 2016					15.4
Q4 2016					14.5
Q1 2017					16.1
Q2 2017					15.4
Q3 2017					15.4
Q4 2017	18.8	4.8	3.2	0.9	

**TABLE 36: REVENUES FROM RETAIL LEASED LINES AND ETHERNET SERVICES**  
(IN EUR THOUSANDS) SEE PAGE 65

	Leased lines	Ethernet services
Q1 2015	11,389.1	
Q2 2015	11,454.0	
Q3 2015	11,309.5	
Q4 2015	11,514.8	
Q1 2016	10,089.1	
Q2 2016	10,235.4	
Q3 2016	9,666.9	
Q4 2016	9,847.7	
Q1 2017	9,491.5	
Q2 2017	9,467.8	
Q3 2017	9,081.6	
Q4 2017	3,085.6	20,817.0

**TABLE 37: NUMBER OF TERMINATING SEGMENTS (IN THOUSANDS)**  
SEE PAGE 66

	≤ 10 Mbit/s	> 10 to ≤ 100 Mbit/s	≥ 100 to < 1 Gbit/s	≥ 1 Gbit/s	TOTAL
Q1 2015					18.2
Q2 2015					18.8
Q3 2015					18.0
Q4 2015					17.2
Q1 2016					16.2
Q2 2016					18.0
Q3 2016					18.4
Q4 2016					18.2
Q1 2017					18.4
Q2 2017					18.4
Q3 2017					18.8
Q4 2017	7.2	6.7	3.1	0.4	

**TABLE 38: WHOLESALE REVENUES FROM LEASED LINES AND ETHERNET SERVICES**  
 (IN EUR MILLIONS) SEE PAGE 67

	Leased lines	Ethernet services
Q1 2015	13.3	12.4
Q2 2015	13.7	12.7
Q3 2015	13.4	13.1
Q4 2015	12.1	13.2
Q1 2016	9.4	14.6
Q2 2016	8.6	16.2
Q3 2016	9.3	14.4
Q4 2016	8.8	20.7
Q1 2017	9.2	18.9
Q2 2017	8.3	19.4
Q3 2017	7.6	19.5
Q4 2017	4.6	25.4



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# International comparisons and technology indicators

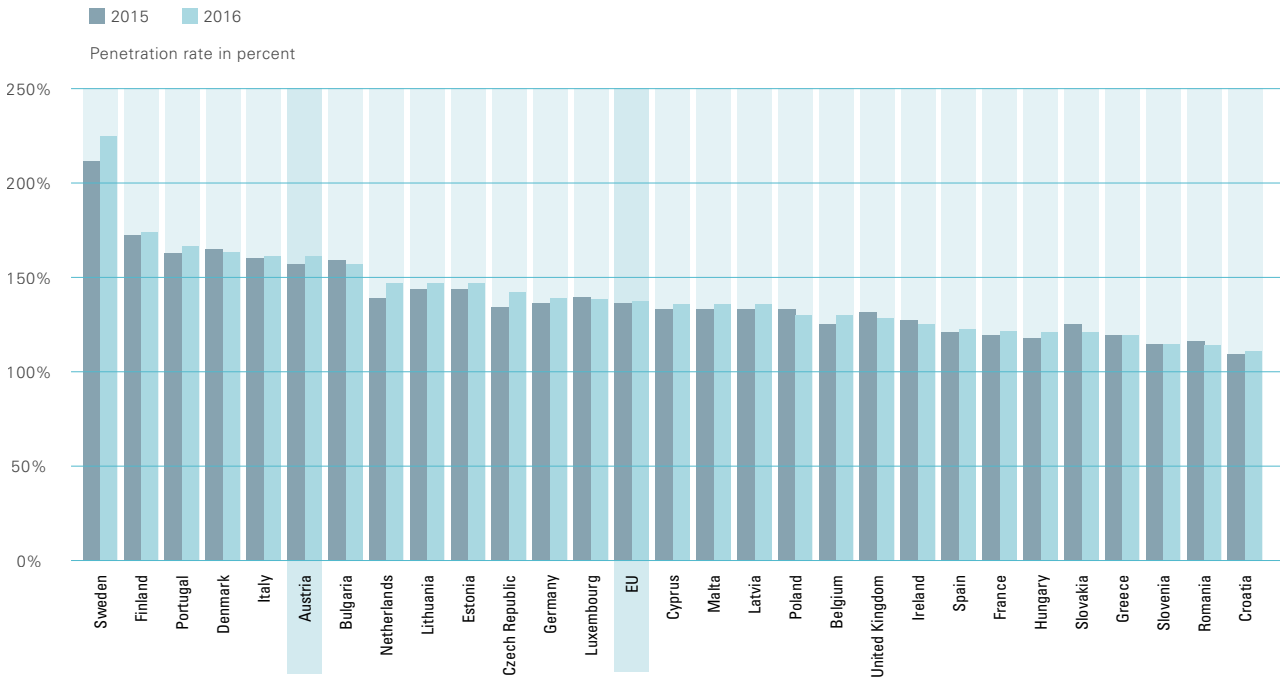
This section includes several comparisons of European mobile and broadband services data. The statistics given here are an extended and more in-depth analysis of the data on the Austrian market discussed in sections 1 to 5. The data are taken mainly from the Digital Agenda Scoreboard of the European Commission. It contains a series of indicators charting the progress towards the goals of the Digital Agenda of the European Commission.

All other charts in this section draw on the most recent figures available. Regularly updated data, including the option of generating interactive charts, can be found on the website of the Digital Agenda (<http://ec.europa.eu/digital-agenda/en/scoreboard>).

6	International comparisons and technology indicators	71
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## Mobile penetration rate 2015 to 2016

➔ 5% increase in Austria from 2015 to 2016



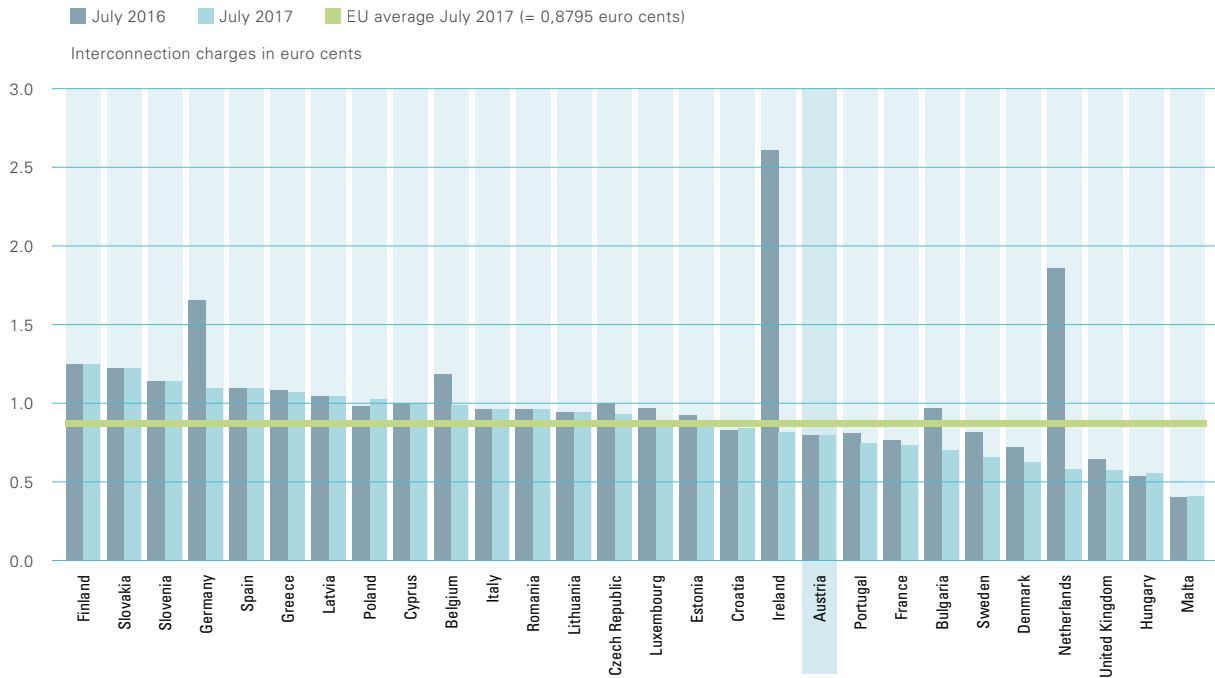
Source: Digital Agenda Scoreboard

- In EU rankings, Austria moved up one place compared with the previous year and was accordingly ranked sixth in 2016 with a mobile penetration rate of 160%.
- This figures places Austria far above the unweighted EU average. This latter figure is 137% and virtually unchanged from the previous year (+1.4%).
- Top of the EU leaderboard is Sweden (224%), which increased its penetration rate by 13 percentage points. Sweden leads second-placed Finland by a solid 51 percentage points.
- Bringing up the rear as in previous years are Slovenia and Romania, each with 114%, and Croatia with 111%.

The chart above provides an international comparison of mobile penetration rates (as of 2015 and 2016). The penetration rate is based on the number of SIM cards per 100 residents.

## Interconnection charges for termination in mobile networks

➔ Austria below EU average



Source: BEREC – Termination Rates at European level, July 2017

- In the EU-wide comparison of interconnection fees for terminations in mobile networks, Austria lost four places, slipping from sixth to tenth place. At an unchanged figure of 0.80 euro cents, Austria is below the EU average.
- This figure has pursued a downward trend since 2014, falling from 1.36 euro cents to 1.04 euro cents in 2016 and to 0.88 euro cents in the reporting year.
- The biggest reduction in termination fees – a drop of 68% – was seen in the Netherlands and Ireland. The Netherlands moved up from the second-last place (1.86 euro cents) to fourth place (0.58 euro cents). In Ireland termination fees fell from 2.60 to 0.82 euro cents and are now lower than the EU average. Although Germany reduced its termination fees by 38% (from 1.66 to 1.10 euro cents), it remains above the EU average and it is now the fourth most expensive country for termination fees.
- As in the previous year, Malta (0.40 euro cents), Hungary (0.55 euro cents) and the UK (0.57 euro cents) remain the three countries with the lowest termination fees.
- In contrast, the most expensive countries for such fees are Finland (1.25 euro cents), Slovakia (1.23 euro cents) and Slovenia (1.14 euro cents). Figures for termination fees in these countries remain unchanged from 2016.

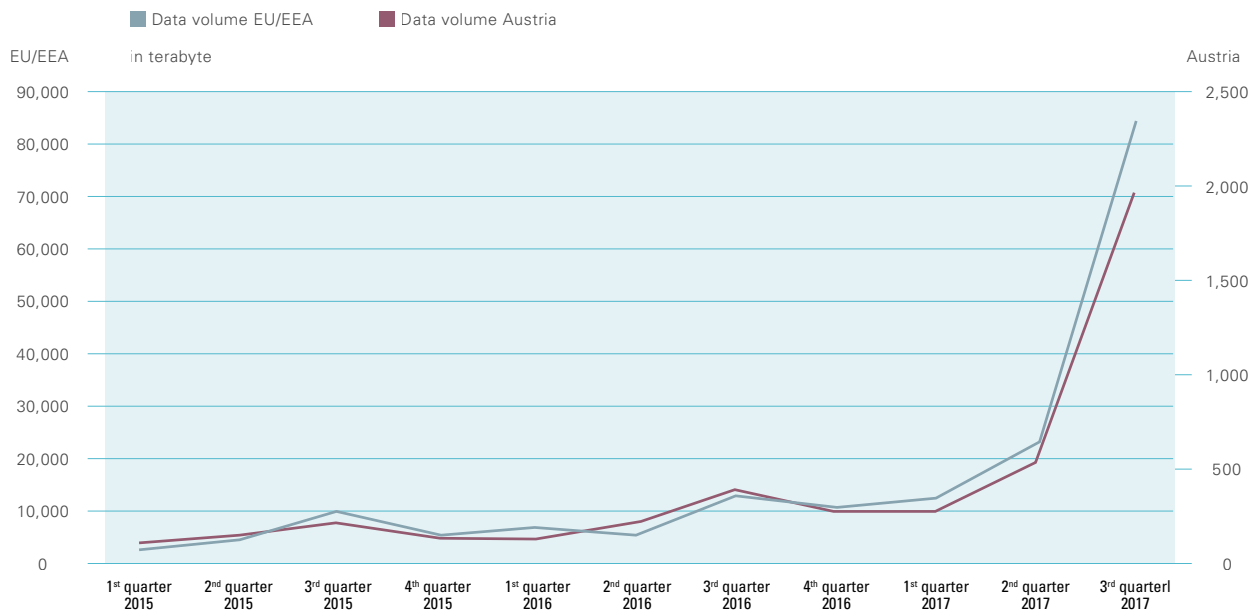
The chart above provides an international comparison of mobile termination charges.

The raw data underlying this chart can be found at the end of the section.

## Roaming – retail market

### Data volumes within the EU and the EEA

➔ Increase of 502% within the EU and EEA in twelve months



Source: RTR, BEREC (Benchmark Data Report)

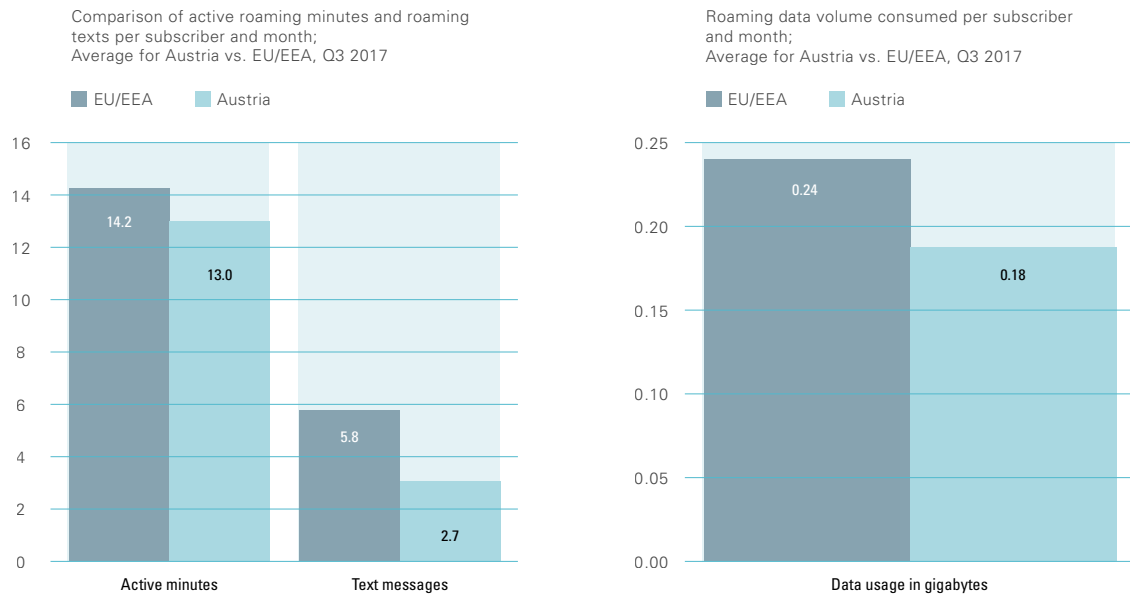
- Roaming data traffic has pursued an upward trend for many years. As a result of the summer boost to travel abroad, data usage in Q3 is higher than in the remaining quarters. A significant increase in the EU/EEA was recorded (+435%) in 2017, which can be attributed to the introduction of roam like at home (RLAH) on 15 June 2017.
- Austria also saw a marked increase in roaming volume from Q3 2016 to Q3 2017 (+388%). It should be noted that the data volume trend in Austria mirrors the trend seen in the EU/EEA.

The chart plots the trend in recent years for retail roaming data volumes (in terabytes) within the EU/EEA against figures for data usage in Austria.

## Roaming – retail market

### Traffic volumes per subscriber and month

➔ Austria below EU/EEA average in Q3 2017



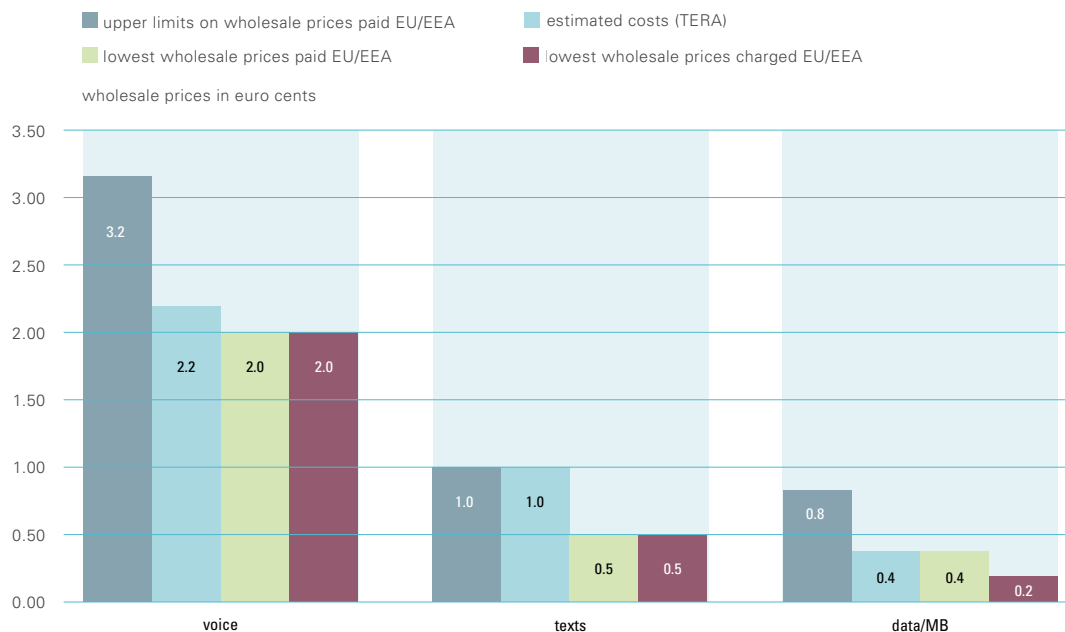
Source: RTR, BEREC (Benchmark Data Report)

- In terms of roaming, Austria is below the EU/EEA average both for active minutes and the number of texts sent, as well as for the data volume consumed per subscriber and month.
- Austria is closest to the EU/EEA average in terms of active roaming call minutes per subscriber (9% below). An Austrian subscriber spends around 13 minutes roaming in the EU/EEA per month.
- In Austria the average volume of roaming data consumed per subscriber and month is 22% lower than the EU/EEA average, amounting to 0.18 GB in 2017 (around 184 MB per month).
- Austria is also far below the EU average in terms of texts sent while roaming, with Austrian customers sending only roughly half as many text messages while abroad as the average EU or EEA customer. In Q3 2017 only around 2.7 texts were sent per month.

The charts compare Austrian customers with EU and EEA citizens in terms of active minutes, texts and data volume per subscriber and month used while roaming.

## Wholesale roaming market

### Wholesale prices below upper limit for wholesale



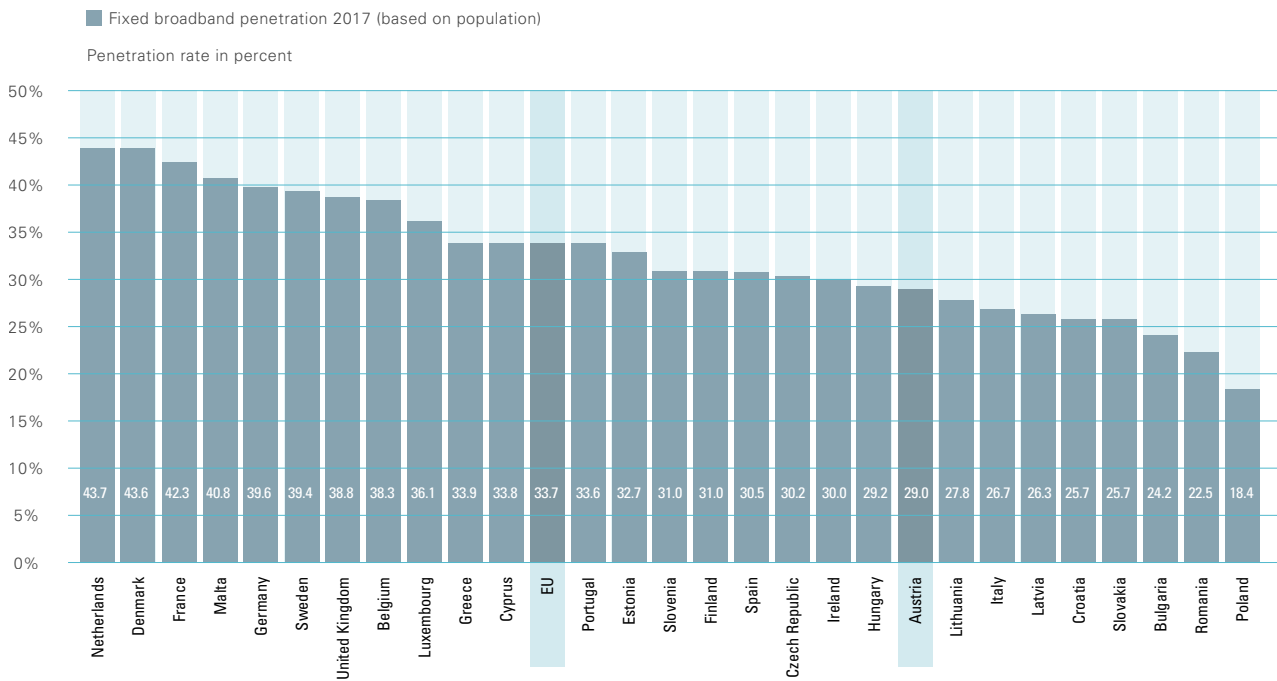
Source: RTR, BEREC (Benchmark Data Report)

- With the entry into force of the Roaming Regulation on 15 June 2017, new upper limits apply to wholesale roaming fees for voice, texts and data. In all three categories, both the lowest wholesale price charged and the lowest wholesale price paid in the EU/EEA are below this upper limit, and are even below the costs of providing wholesale roaming services as calculated by TERA Consultants.
- Since 15 June 2017, the average wholesale fee charged must not exceed an upper limit of 3.2 euro cents per minute. In Q3 2017 both the lowest wholesale price charged and the lowest wholesale price paid in the EU/EEA were below this upper limit, at a figure of 2 euro cents.
- The fee per text message was actually less than half of the upper limit of 1 euro cent set by the EU.
- In terms of roaming data, the lowest wholesale prices were also less than half of the 0.77 euro cents per MB specified as the upper limit. In the coming years, the Roaming Regulation requires a steady reduction in this fee, which was set at 0.60 euro cents as of 1 January 2018.

The table contrasts figures for the upper limits on wholesale prices as set from 15 June 2017 with the lowest wholesale prices actually paid or charged for Q3 2017. The chart also shows an estimate of costs from a cost model developed by TERA Consultants.

## Fixed broadband penetration rate

➔ No increase in Austria compared with the previous year



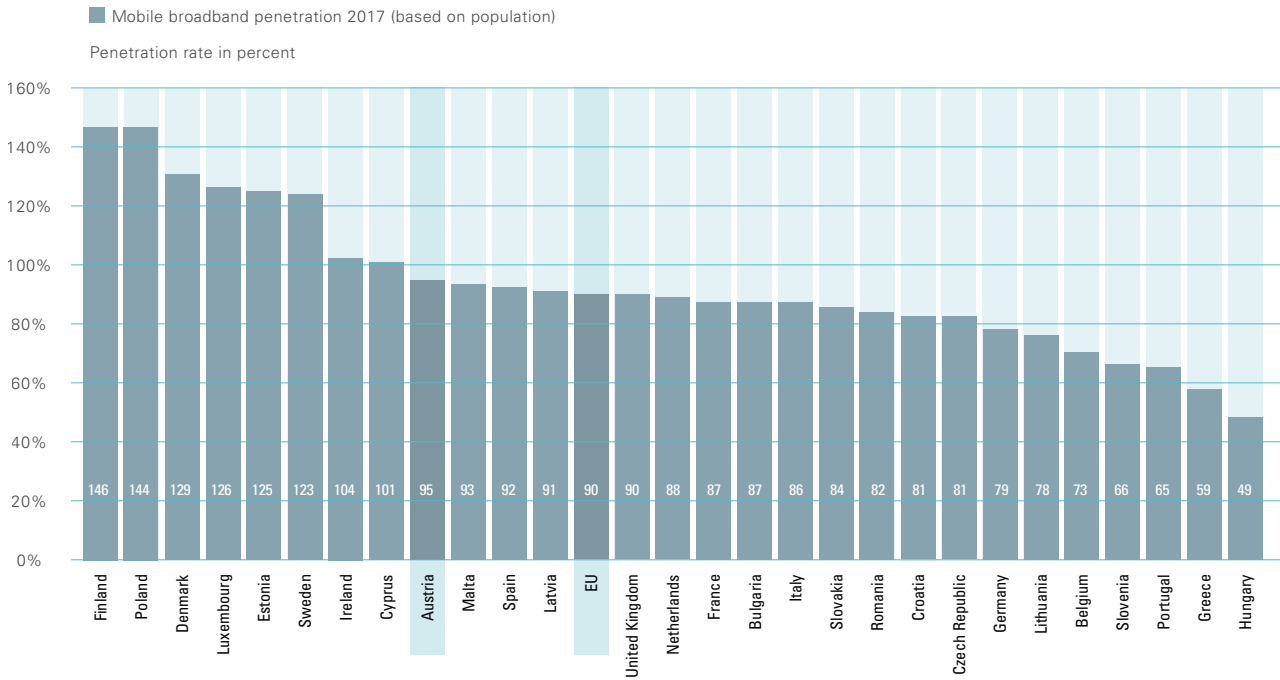
Source: Digital Agenda Scoreboard

- In a year-on-year comparison, Austria's fixed broadband penetration (as a percentage of population) remains stable at 29%. The EU average penetration rate also remained virtually unchanged (+1 percentage point) at 34%.
- In 2017 the Netherlands and Denmark again recorded the highest density of fixed broadband connections, at 44% each, followed by France with 42%.
- The biggest gains (+4 percentage points) were made by Sweden, which now moves up from eighth to sixth place.
- Poland again brings up the rear with an unchanged 18%.

The chart above provides an international comparison of broadband penetration rates based on fixed infrastructure such as DSL, cable broadband, unbundled lines (see Glossary) and wireless (as of June 2017). The penetration rate is calculated as the number of broadband connections per 100 residents. Mobile broadband access is not included in these figures.

## Mobile broadband penetration rate

➔ Austria makes substantial gains



Source: Digital Agenda Scoreboard

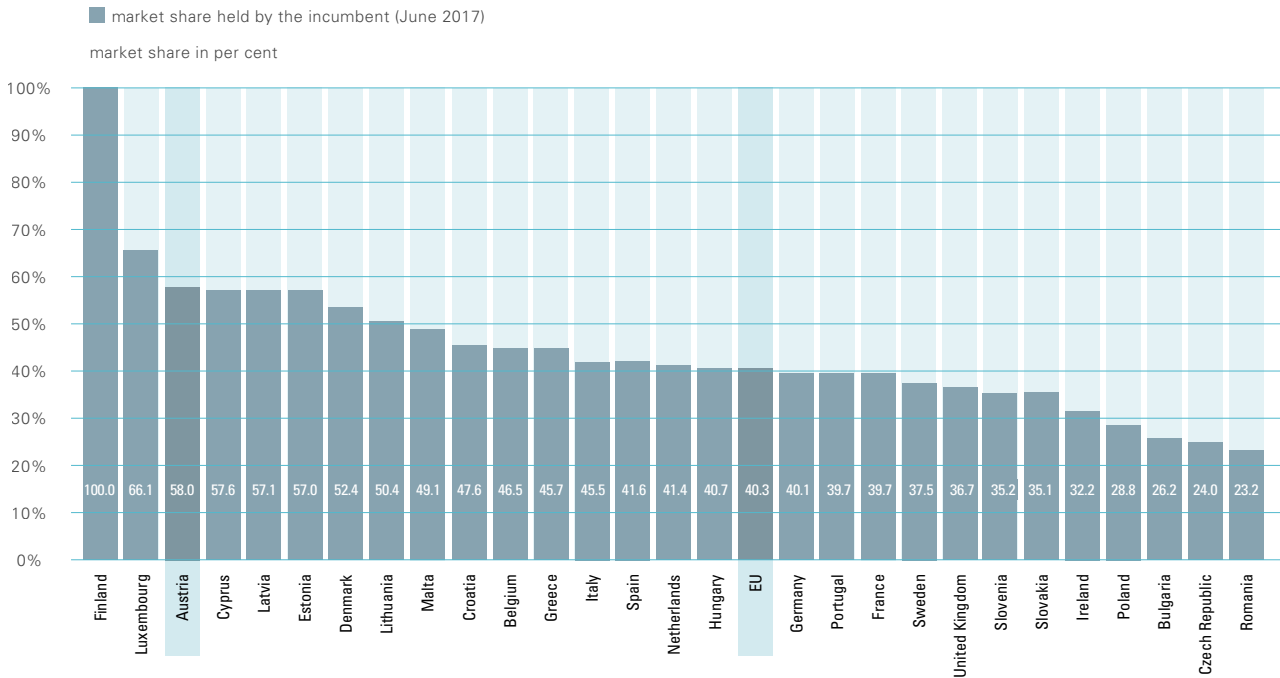
- With a broadband penetration rate of 95%, Austria's figure for 2017 is higher than the EU average of 90%. In a year-on-year comparison, Austria's addition of 18 percentage points since June 2016 is the third-highest increase in rate, behind Poland (+29 percentage points) and Malta (+25 percentage points), and means it has moved up nine places (from eighteenth to ninth place).
- Top of the table is again Finland with an unchanged 146%, followed by Poland with 144%.
- At the other end of the scale are Greece with 59% (+9 percentage points) and Hungary with 49% (+6 percentage points).
- Virtually all countries have seen year-on-year gains of at least three percentage points for this figure, with the exception of Finland, Italy and the UK.

The chart provides an international comparison of mobile broadband penetration rates (as of June 2017). The penetration rate is calculated as the number of mobile broadband connections (active broadband SIM cards) per 100 residents. Broadband access based on fixed infrastructure (such as DSL and cable broadband) are not included in these figures.



## Broadband market shares held by incumbents

➔ Austria with third-strongest incumbent



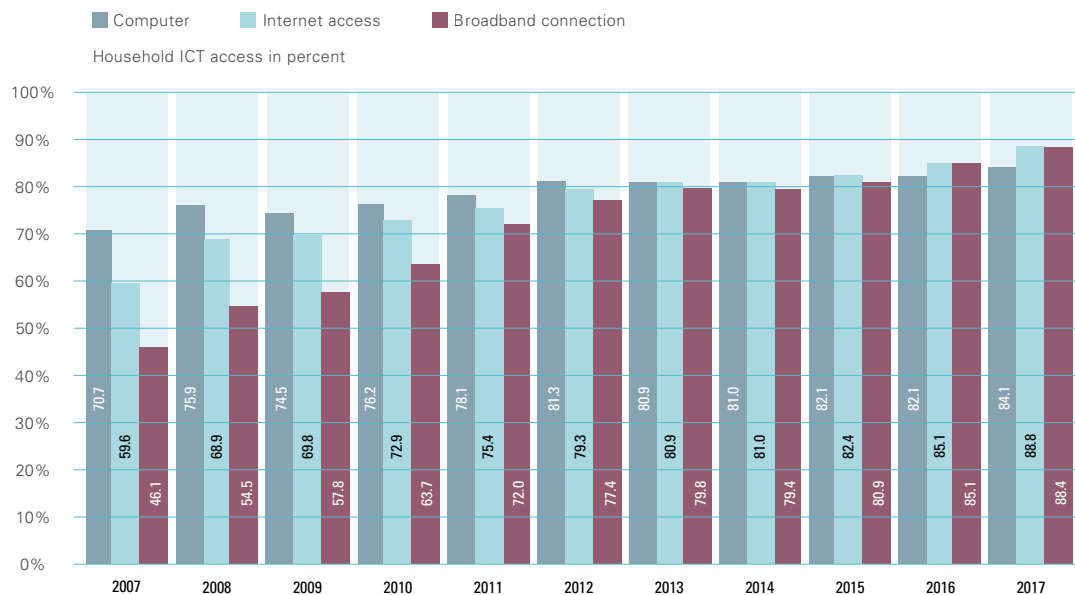
Source: Digital Agenda Scoreboard

- In an international comparison of market share for the respective incumbents, the top spots were again taken this year by Finland (100%) and Luxembourg (66%), with market share unchanged in both cases.
- Based on market leader A1 Telekom Austria (and an unchanged market share of 58%), Austria has advanced from sixth to third place. This is the result of market share losses for incumbents in Cyprus (-2.7 percentage points), Latvia (-1.5 percentage points) and Estonia (-1.4 percentage points).
- The smallest market shares are held by market leaders in Romania (23%), Czech Republic (24%) and Bulgaria (26%).

The chart above shows the shares of the retail broadband market held by each of the incumbents (former monopoly operators) as of June 2017. It includes only broadband access based on fixed infrastructure (such as DSL and cable broadband). Mobile broadband access is not included in these figures.

## Computers, internet access and broadband in households

### Internet access increasingly without computer



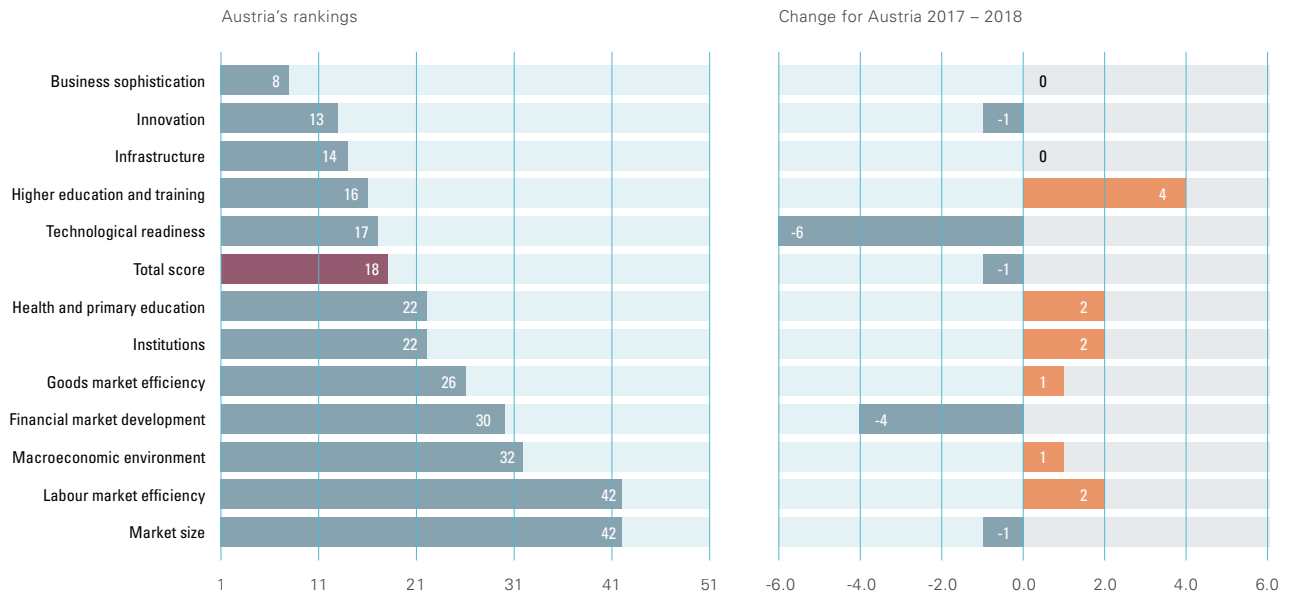
Source: Statistics Austria

- Up to 2013, statistical data on the use of computers and on internet access and broadband connections in households still showed substantial differences and growth rates; since then a certain saturation level has apparently been reached. In the year under review, 84.1% of the population owned a computer. A total of 88.8% had access to the internet, with 88.4% using it via a broadband connection.
- The fact that there were fewer computers than internet connections is an apparent contradiction which can be explained by the increasing popularity of smartphones and tablets with mobile broadband access.
- About 15% of households have neither fixed nor mobile internet access.

This chart shows the percentages of Austrian households with computers, internet access and (fixed or mobile) broadband access over the years.

## Global Competitiveness Index

➔ Austria improves again in international rankings



Source: World Economic Forum, Global Competitiveness Report 2017–2018

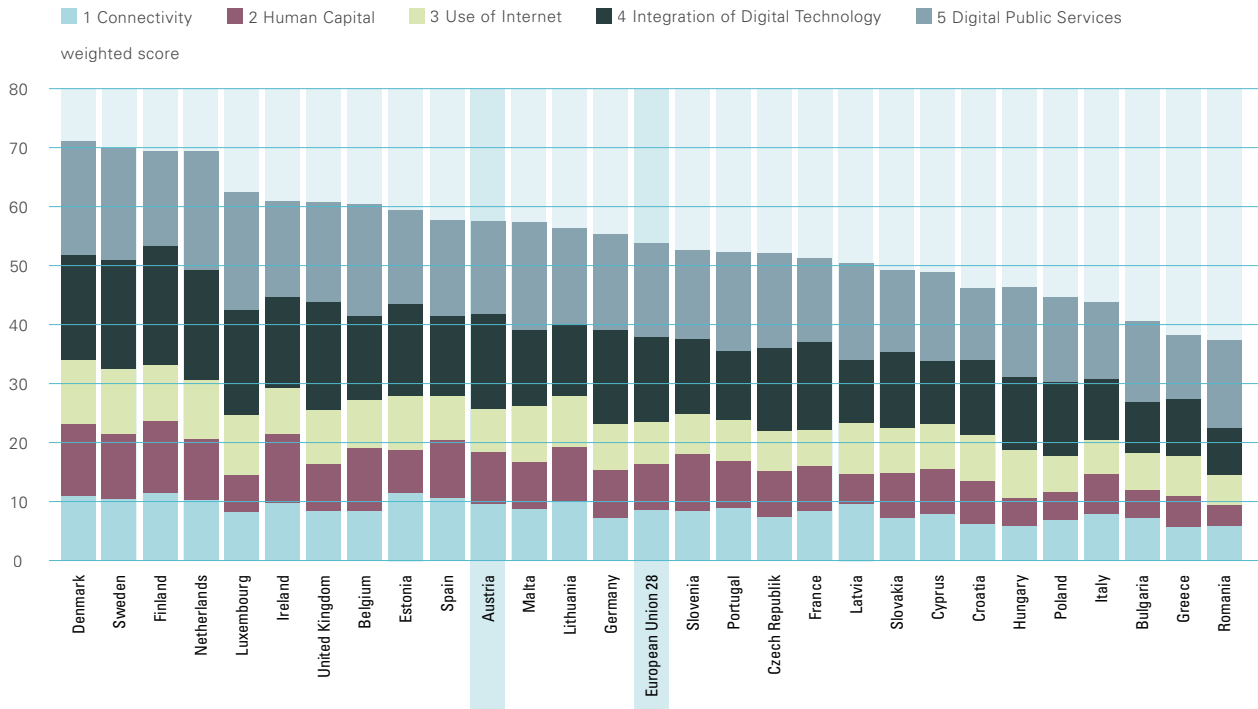
- In the latest rankings published by the World Economic Forum, Austria has placed eighteenth after again improving its standing by one rank.
- Austria also made strong gains in the pillars of technological readiness (advancing six ranks) and financial market development (advancing four ranks).
- Austria remains well-placed in terms of the business sophistication pillar (rank 8), while improving its rating for innovation by one rank and thereby moving up to thirteenth place.
- Room for improvement still remains in terms of labour market efficiency (loss of two places to rank 42). Austria's other ranking of 42 for market size simply reflects the country's size and cannot be influenced.
- Top of the table is Switzerland, followed by the USA and Singapore. Germany continues to rank fifth.

The World Economic Forum defines competitiveness as the set of institutions, policies and production factors that determines a country's level of productivity. A country's productivity, in turn, determines the level of prosperity that its economy can generate. In other words, the greater a country's competitiveness, the more likely it is to generate high incomes. Productivity is by definition an input-output ratio, that is, a measure of the best possible output that can be achieved with the existing production factors.

The twelve parameters are measured either by surveys or observations. The index also takes into account a country's level of development. A distinction is accordingly made between factor-driven, efficiency-driven and innovation-driven economies. Developing countries are among the factor-driven economies, while western industrial nations represent innovation-driven economies.

## Digital Economy and Society Index (DESI)

➔ Austria holds on to eleventh place in international rankings



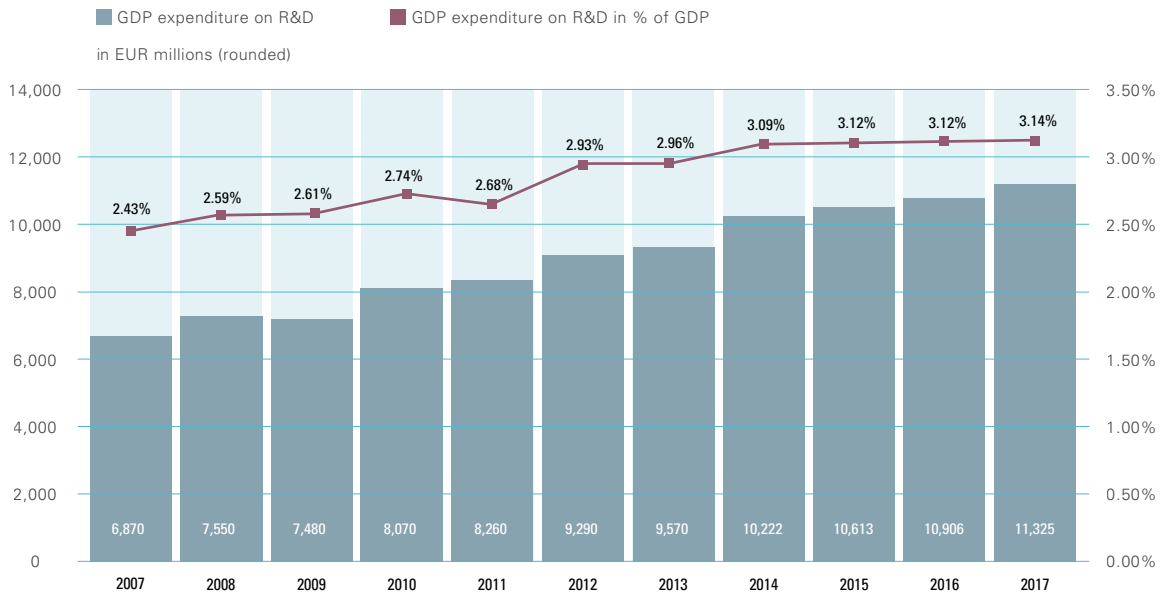
Source: European Commission, DESI Report 2018

- As in 2017, Austria is again placed eleventh this year, scoring 58 overall (2017: 54.7), and therefore significantly higher than the EU average of 54 (2017: 50.8).
- In terms of fixed and mobile broadband penetration, Austria is currently ranked seventeenth.
- In the area of basic digital skills, Austria is placed seventh.
- As regards business digitisation and e-commerce, Austria was able to improve its standing from twelfth to tenth place.
- This year's index is again headed by Denmark, followed by Sweden and Finland.

The Digital Economy and Society Index (DESI) is compiled annually by the EU Commission. The 28 EU Member States are compared based on various technology parameters. In the evaluation by the European Commission, Member States were surveyed according to performance indicators along five main dimensions in 34 individual categories, together resulting in a digitisation rating (DESI). The chart shows Austria's ranking in the DESI overall and for the five main dimensions. The countries in brackets (with the asterisk) denote the leader in each of the main dimensions.

## Gross domestic expenditure on R&D in absolute terms and as a proportion of GDP

➔ New record set for research-spending ratio



Source: Statistics Austria

- Again in 2017, the research-spending ratio rose slightly year-on-year to 3.14% of GDP, and has therefore now remained above 3% for four consecutive years.
- Absolute expenditure on research and development increased by 3.8% to EUR 11.3 billion.

The annual overall estimate of gross domestic expenditure on research and development (R&D) is based on two sources: the detailed structural data on R&D obtained by Statistics Austria from primary data surveys, and on the annual analysis and evaluation of the research-related items in the budgets of the federal and provincial governments of Austria. Gross domestic expenditure on R&D, expressed as a percentage of gross domestic product, constitutes the research-spending ratio.



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# Explanatory comments and glossary

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## Explanatory comments on the survey

Published quarterly, The RTR Telekom Monitor details changes in the Austrian telecommunications markets.

The legal basis for the data survey underlying the RTR Telekom Monitor is provided by the Communications Survey Ordinance (KEV), Federal Law Gazette II No. 365/2004, which came into force on 1 October 2004. Under the KEV, RTR is obliged to carry out quarterly surveys of communications markets and to compile and publish the statistics.

The most recent amendment to the KEV was in autumn 2017 – five years after its last far-reaching revision in 2012. The amended KEV entered into force on 1 October 2017, which means that the data collection process had already been appropriately adjusted for Q4 2017. Key changes include the following:

- For mobile, retail revenues are no longer differentiated by services and SIM cards are no longer split according to 2G, 3G or 4G; instead, the only differentiation in both cases is between data-only subscriptions and other plans. Data volume figures now also use only these two categories.
- In broadband, data volume is queried for fixed retail connections.
- In fixed network figures, connection fee revenues and call duration are no longer distinguished according to call distance.
- For leased lines, a change in the definition has caused a shift in figures between leased lines and Ethernet services: on the new survey form, leased lines with consumer-side Ethernet interfaces are no longer recorded under 'leased lines' but are included in 'Ethernet services'. Bandwidth subgroupings have also been abandoned: since bandwidth is no longer a differentiator, this has greatly simplified the revenue data query.

In order to reduce the workload for operators, in accordance with Art. 4 Par. 1 KEV, RTR has selected the sample to represent at least 90% of the total market in each segment (mobile communications, broadband, fixed network and leased lines). From this sample, RTR extrapolates the data for the total market. The data for the total market are available to RTR from the last complete survey taken as part of the market analysis procedure (most recently in 2015).

The charts and tables in the RTR Telekom Monitor contain for the most part rounded values. Due to occasional post-hoc data corrections, the values in the charts and tables presented here may vary slightly from the information provided in earlier issues of the RTR Telekom Monitor.

All datasets resulting from data collection in accordance with the Communications Survey Ordinance can be downloaded from the RTR website as open data in the formats Excel, delimited text, JSON or XML (<https://www.rtr.at/de/inf/odKEV>). Numeric data provided by the website is not rounded. This website also hosts the mobile price index data (<https://www.rtr.at/de/inf/odmfi>).



## Airtime (mobile telecommunications)

Airtime refers to a wholesale service that mobile network operators provide for domestic resellers. A reseller (airtime reseller) is a communications service provider that offers public mobile services to retail customers but does not provide those services via a proprietary network. This includes all mobile service providers, such as resellers or (enhanced) service providers, that do not operate their own (radio or core) communications network to provide mobile services.

## Bitstream and resale

Bitstream and resale access are wholesale products at different levels of the value chain, on the basis of which internet connections can be provided to end users. For bitstream access, data traffic is transferred at predefined (regional or national) handover points, with the wholesale customer directly providing internet connectivity. By comparison, in the case of resale access, internet connectivity is provided by the wholesale supplier, with the wholesale customer acting merely as reseller.

## Broadband

Broadband internet access or a broadband internet connection refers to an internet connection (technology neutral) with a download speed higher than 144 kbps. The internet connection can also be provided as part of a bundle with other services. The connection can be established by the following means:

- Proprietary line (a copper wire pair in the A1 Telekom Austria AG network)
- Unbundled line (see unbundling)
- Virtual unbundling (see virtual unbundling)
- Coaxial cable (cable modem)
- Fixed wireless access, e.g. WLAN, WiFi or WLL ('fixed' access but not via a hotspot)
- Other infrastructure, including powerline (PWL) broadband via the power grid and satellite (SAT) broadband access

## Carrier Pre-Selection and Call-by-Call

Carrier pre-selection (CPS) refers to setting a permanent carrier network code (10xx) to route all of a subscriber's traffic (except for calls to value-added services and public service numbers) via a pre-selected carrier network.

In contrast, call-by-call carrier selection (CbC) makes it possible to route individual telephone calls via a service provider other than the network that provides the subscriber line. In this case, the subscriber has to dial the carrier network code (10xx) before each call.

## Unbundling

In telecommunications, unbundling refers to the separate provision of specific services which were previously available only in conjunction with other services. The unbundling of subscriber lines from fixed network access as offered by the incumbent operator, for example, gives alternative service providers direct access to customers without requiring the latter to install the 'last mile' themselves, as they can lease (naked) subscriber lines from the incumbent at a regulated price. Unbundled network elements are made available where as a result of a market analysis procedure the regulatory authority has identified one company having significant market power and has imposed on that operator the obligation to grant access to its telecommunications network and the corresponding unbundled elements.

## Ethernet services

Ethernet services with guaranteed bandwidth are lines that provide guaranteed bandwidth between two network termination points. From Q4 2017, leased lines with consumer-side Ethernet interfaces are no longer recorded under 'leased lines' as previously but are included in 'Ethernet services'.

## Fixed network revenues (voice telephony)

Retail revenues from fixed network voice telephony are made up of revenues from basic monthly fees, setup charges and connection fees. Basic fees refer to revenues that are due periodically and do not depend on the actual use of the subscriber line. Such fees include revenues from monthly flat rates (e.g. packages with a specified number of minutes), although such rates have not played a significant role in fixed network services up to now. The category does not include 'optional tariffs', 'flat-rate tariffs' or revenues from products bundled with broadband.

Setup charges include revenues generated from the setup, transfer and decommissioning of fixed telephone lines. Retail revenues from carrier services depend on the number of call minutes, in other words, the more telephone calls a fixed subscriber makes, the higher their bill normally is.

Wholesale revenues includes revenues from origination, termination and transit services.

## Fixed wholesale market for voice telephony

Within the fixed wholesale market, a distinction is made among origination, termination and transit services. Origination refers to calls that originate from a fixed network termination point in a carrier's own network. Termination refers to the routing of calls to a fixed network termination point in a carrier's own network. Transit refers to calls between two networks or between two interconnectable exchanges in one network. These services can be provided within the same network (proprietary services such as intra-network calling) or externally between network operators (e.g. origination to services and carrier network operators or termination from an external network). Origination, termination and transit services are not charged to the customer directly but are settled between network operators (at wholesale level).

## Hybrid connection

Hybrid products are products with which an internet connection can be used either via mobile or fixed (wired) broadband. (This category excludes products having the mobile connection used only as a backup in the event of a fault in the fixed connection.)

## International roaming

In connection with mobile telecommunications, the term 'roaming' refers to the use of a mobile telephone outside the coverage area of the customer's own network operator (home network), in which case the mobile phone uses the service of another network (host network). In international roaming, the home and host networks are located in different countries and their coverage areas generally do not overlap.

## Leased lines

Leased lines provide symmetric transmission capacity between two points, without switching and with a guaranteed bandwidth. Leased lines are also referred to as 'dedicated lines' or 'point-to-point connections'. A distinction is made between retail and wholesale leased lines.

Retail leased lines are leased lines which are provided not for operators or providers of communications networks or services (companies having general authorisation) but for companies outside the telecommunications sector (such as banks, insurance companies and retail stores).

Wholesale leased lines are leased lines provided for other operators or providers of communications networks or services. A distinction is made between trunk segments and terminating segments (see trunk segments and terminating segments).

In the case of leased lines, it should be noted that time lags between revenues and demand often occur in leased lines markets, frequently resulting in strong fluctuations between months or quarters due to settling accounts for project business and to reimbursements and credits.

From Q4 2017, leased lines with consumer-side Ethernet interfaces are no longer recorded under 'leased lines' as previously but are included in 'Ethernet services'.

## Mobile broadband

With mobile broadband, a distinction is made between data-only subscriptions with a fixed monthly fee, data subscriptions without a fixed monthly fee and smartphone subscriptions.

Up to Q4 2015, data-only subscriptions (which cover data but not voice calls or text messages) were restricted to those that included at least 250 megabytes in the monthly rate. This restriction was lifted as of Q1 2016. From Q4 2017 onwards, an activity criterion has also been introduced for this category: SIM cards

are counted only if they have been used for internet access at least once in the corresponding quarter.

Products not based on a fixed monthly charge include products that are used by customers to access the internet at least once each quarter, even where such products do not include free data as part of the monthly charge.

Smartphone subscriptions are all contracts for voice and text messaging services that also include data and are used by customers to access the internet at least once each quarter. Up to Q4 2015, such subscriptions were additionally restricted to those that included at least 250 megabytes in the monthly rate. This restriction was lifted as of Q1 2016.

## Mobile Virtual Network Operator (MVNO)

Mobile Virtual Network Operators (MVNOs) are communications network operators that do not have their own radio communications networks (or the corresponding frequency usage rights) but operate essential elements in the core network (such as a home location register or HLR and a mobile switching centre or MSC), possess corresponding addressing elements (such as a mobile network code) and directly administer SIM cards. MVNOs are generally active as providers in both the retail and wholesale markets. As they do not have their own radio communications networks, they have to rely on corresponding wholesale services from mobile network operators. Examples of MVNOs are Mass Response (Spusu) and UPC (UPC mobile).

## Mobile telecommunications revenues

The category of 'retail revenues from mobile telecommunications' includes all revenues (such as basic fees, activation charges, service charges and connection charges) earned by a provider from (their own) retail customers in Austria, including revenues earned when their customers use roaming services in other countries.

These were grouped as follows up to and including Q3 2017:

- a. revenues clearly attributable to mobile voice telephony or value-added voice services;
- b. revenues clearly attributable to text messaging and value-added text messaging services;
- c. revenues clearly attributable to mobile data and value-added data services (including multimedia messages);
- d. Bundled products and base fees: revenues from bundled products and other revenues not clearly attributable to one of the categories above;
- e. other revenues, such as reminder charges.

As of Q4 2017, a distinction is made only between retail revenues from data-only subscriptions and revenues from other plans.

Mobile wholesale revenues are revenues from origination and termination charges, from selling airtime to resellers and revenues from national and international roaming (including MVNO access).

## Number porting

Number porting allows customers to retain their telephone numbers when switching service providers. The RTR Telekom Monitor only includes the porting procedures/imports of telephone numbers for an operator in one quarter, meaning SIM cards in the case of mobile operators and subscriber numbers in the fixed network. Cases of 'reverse porting', where numbers are ported back to the issuing operator (for example after cancellation by a subscriber), are not considered porting. If a subscriber number is ported several times within a quarter ('subsequent porting'), this is counted separately each time.

## Broadband Price index

The Broadband Price Index is a hedonic price index for fixed and mobile broadband products. Hedonic means that both price changes and changes in product features (in particular download rate and download volume) are taken into account. To arrive at the index, a regressive analysis of prices is performed in relation to product features and time variables.

For the calculation, tariffs and product features are surveyed quarterly for the broadband products supplied by the major providers (currently A1, UPC, Tele2, LIWEST, Salzburg AG, Kabelplus, Russmedia IT, T-Mobile, Hutchison and HoT). All rate plans available to new customers at that particular time are collected. Both standalone broadband products and products bundled with fixed line telephony or TV are surveyed. In the case of mobile broadband, prepaid rates are not included. In addition to monthly charges, one-off charges and annual charges as well as special offers are taken into account. The most expensive 10% of plans are not included in the calculation, as they can be assumed to be in low demand by customers. The remaining rate plans are weighted in proportion to the operators' market shares in the respective quarter. In calculation, all rate plans offered by one operator are weighted by the same amount in one quarter. The reference base is 2010.

## Mobile Services Price Index

RTR calculates the monthly prices for the different user categories based on the subscription information published by the Austrian Chamber of Labour (AK Tarifwegweiser). To allow rate changes (price increases and decreases) to be readily identified, only the new plans available for subscription in the particular month are taken into account.

Details relating to minutes, text messages and data services used monthly by the particular user category, as well as information on the subsidies paid out for end-user devices for each tariff plan, are based on information provided by mobile network operators; where such information does not exist, RTR makes a best estimate based on available information.

Average prices per month are calculated for four different user categories. To reflect the fact that the medium, high and power user categories additionally make use of data services, the results for these categories are based only on 'smartphone subscriptions' (i.e. those including data volumes). Users in the fourth category ('low users') exclusively use voice and text messaging services.

Users are categorised as follows: for each service (voice, text messaging and data) consumers are ranked according to frequency of usage and then divided into four equally large groups (based on quartiles). One quartile each represents one user category, and the median of the respective quartile is used for the underlying number of used minutes, text messages and megabytes.

The user categories are integrated with the rate data using the procedure described in the following. In each case the usage values collected for the previous year are applied with the subscriptions of the current year (e.g. usage in 2012 is used to calculate the prices for each subscription in 2013). The cheapest subscriptions are then determined for each user category and brand from among the new plans available for subscription. Apart from the basic monthly fees and the included minutes, text messages and data volume, the following rate components are reflected in the calculation: activation fee, SIM/service flat fee, minimum revenue, where appropriate, as well as the price per minute, text message and megabyte beyond the included quantities and any end-user device subsidies (written off over 24 months).

An average price is then calculated from as many as five of the cheapest subscriptions offered under each brand. Here, the following brands are taken into account: A1, T-Mobile, Drei, tele.ring, Yesss!, Bob, Ge.org, Red Bull Mobile, S-Budget; since the first quarter of 2015: HoT and UPC; since Q2 2015: VOLmobil Wowww! and Spusu. Since Q3 2015 subscriptions offered under the Allianz SIM brand by ATK Telekom and Service GmbH have also been reflected and since Q4 2015 eety und YooPi as well. From Q1 2017 onwards, subscriptions offered by Krone mobile, Kurier mobil, LIWEST, Media Markt Mobil, Rapid Mobil and Saturn Mobil have been included in the Mobile Price Index, as well as, from Q4 2017 onwards, rates offered by Help. The price per brand is subsequently weighted using the brand's market share.

The calculated price index is a linked index, meaning that, similar to the Consumer Price Index, usage is adjusted at regular intervals, in this case once a year.

The table below lists for the four user categories the average usage figures on which calculation is based:

TABLE USER CATEGORY

Year	Power Minutes	High Minutes	Medium Minutes	Low Minutes
2010	550	240	120	20
2011	530	250	120	20
2012	510	240	100	20
2013	500	230	110	20
2014	471	208	93	19
2015	469	210	94	21
2016	450	198	91	23
2017	446	196	91	23

Year	Power Text messages	High Text messages	Medium Text messages	Low Text messages
2010	229	33	5	1
2011	243	42	7	1
2012	260	46	7	1
2013	168	42	9	1
2014	104	28	6	1
2015	90	23	6	1
2016	66	17	5	1
2017	53	13	4	1

Year	Power Data in megabytes	High Data in megabytes	Medium Data in megabytes	Low Data in megabytes
2010	136	9	2	0
2011	417	36	3	0
2012	932	134	2	0
2013	1,483	345	21	0
2014	2,093	632	60	0
2015	2,382	816	171	0
2016	3,440	1,240	381	0
2017	5,118	1,557	428	0

## Private customers – business customers

Separate differentiators apply to fixed network and mobile in the private and business customer segments. While the fixed network distinguishes by product (private vs. business customer product), mobile networks distinguish by customer.

The following applies to fixed connections (DSL, cable, wireless and fibre optics):

‘Business customer products’ are all broadband products or product bundles with broadband that are geared towards business customers. These products are either discernible by their name (‘business’, ‘office’, etc.) or include certain features that are not typically offered to private customers, such as one or more fixed IP addresses, a larger number of mailboxes, more webspace, a domain name, a security package (antivirus, firewall or similar), business SLAs or lower average overselling on the backbone. SDSL products are also to be viewed as business customer products.

‘Private customer products’ are therefore any products not to be categorised as business customer products.

The following applies to mobile connections:

Business customers are all legal persons and corporations under public or private law, partnerships, registered companies and partnerships under the Civil Code, as well as natural and legal persons who are entrepreneurs within the meaning of Art. 1 of the Austrian Consumer Protection Act, Federal Law Gazette 140/1979 as amended (including start-up activities within the meaning of Art. 1 Par. 3 leg. cit). In this context, a business means any organisation that is intended to be permanent and is for the purpose of independent commercial activity, even though it may be a non-profit enterprise. Private customers are all customers not falling under the definition above.

## Technical measurement (real minutes)

Real minutes refer to the actual duration of calls made by customers. In contrast, billed call minutes indicate the number of minutes actually charged to those customers. The main factors accounting for the difference between these two figures are the number of free minutes included in the basic fee, which play a much greater role in mobile networks than in the fixed network, and the billing increment.

## Trunk segments and terminating segments (leased lines and Ethernet services)

At wholesale level, a distinction is made between trunk segments and terminating segments. Trunk segments refer to those leased lines and Ethernet services that, while not generally extending to the subscriber's network termination point, mainly serve to link exchange points in those 28 Austrian towns where A1 Telekom Austria AG has established points of interconnection (POIs) with other telecommunications operators. Terminating segments, in contrast, refer to those leased lines or Ethernet services at wholesale level which are not classified as trunk segments.

## Virtual unbundling

According to an official TKK decision, A1 Telekom Austria AG is obliged to offer virtual unbundling in areas where it is rolling out fibre optic cable (Next Generation Access – NGA). Virtual unbundling is a wholesale service that enables alternative providers to offer their own (broadband) products to end users, in a manner similar to physical unbundling.

## Voice over Broadband (VoB)

VoB is voice telephony service based on a broadband connection (standalone or bundled). VoB does not include voice over internet services such as Skype, where services are provided on the basis of the (public) internet but with the internet connection provided by an independent third party.





# Publishing information

## Owner and publisher

Austrian Regulatory Authority for Broadcasting and Telecommunications  
(Rundfunk und Telekom Regulierungs-GmbH)  
Mariahilfer Strasse 77–79, 1060 Vienna, Austria  
Tel.: +43 (0)1 58058-0; fax: +43 (0)1 58058-9191; e-mail: [rtr@rtr.at](mailto:rtr@rtr.at); web: [www.rtr.at](http://www.rtr.at)

## Responsible for content

Johannes Gungl (Managing Director of Telecommunications and Postal Services),  
Austrian Regulatory Authority for Broadcasting and Telecommunications

## Conceptual design and text

Austrian Regulatory Authority for Broadcasting and Telecommunications

## Graphic design and layout

Westgrat - Agentur für Kommunikation  
cibus Kreativagentur

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