PTS

Report
PTS-ER-2017:10

Date
July 3, 2017

Report:
The Swedish Telecommunications Market 2016

The Swedish Telecommunications Market 2016

Report Number
PTS-ER-2017:10

Reference Number
16-11655

ISSN
1650-9862

Author
Karin Fransén and Andreas Wigren

Swedish Post and Telecom Authority
Box 5398
SE-102 49 Stockholm
Sweden

+46 8 678 55 00
pts@pts.se
www.pts.se

Table of contents

Summary of the Swedish Telecommunications Market 2016 **7**

Sammanfattning av Svensk telekommarknad 2016 **11**

1 Introduction **17**

2 Income in the market **19**

3 Mobile telephone and data services **20**
3.1 Subscriptions - Mobile telephone and data services 20
3.2 Subscription - M2M-services 23
3.3 Call traffic – Mobile telephone services 24
3.4 Number of SMS and MMS 25
3.5 Data traffic in mobile networks 26
3.6 Income for mobile telephone and data services 30
3.7 Income for M2M 30
3.8 Income for interconnection in mobile networks 31
3.9 Market share - mobile telephone and data services 31
3.10 Market share - Mobile broadband 32
3.11 Number porting – Mobile numbers 33

4 Internet services **34**
4.1 Subscriptions - Internet services 34
4.2 Transfer speed - Fixed broadband 38
4.3 Income from internet services 40
4.4 Market share - Broadband in total 41
4.5 Market share - Fixed broadband 43

5 Fixed line telephone services **44**
5.1 Subscriptions - Fixed line telephone services 44
5.2 Telephone traffic – Fixed line telephone services 48
5.3 Income from fixed line telephone services 49
5.4 Income from interconnection in fixed networks 50
5.5 Market share - Fixed line telephone services 50
5.6 Number porting - Fixed line telephone services 51

6 TV services **52**
6.1 Traditional pay TV services 52
6.1.1 Traditional pay TV subscriptions - 52
6.1.2 Income from TV services 56
6.1.3 Market share - pay TV services 58
6.2 Digital terrestrial TV free to air (DTT FTA) 59
6.3 TV viewer figures and other ways of looking at moving images 60

7 Bundled services **61**

8 Data communication services and dark fibre to end customers **63**
8.1 Data communication to end customers 63
8.2 Income from data communication services and dark fibre to end customers 63

9 Ducting **65**
1.1 Data Collection and Implementation 66
1.2 Discrepancies and updates of data 66
1.3 Historical information and market shares 67
1.4 Definitions 67

Appendix **66**
1. Method and definitions **66**
2 List of participants **70**
3 Changes in statistics **77**
4 Report tables **78**
5 Quality declaration **79**

Table

Table 1 Average volume of data used per month 28

Figure

Figure 1 End user market income for electronic communication 19

Figure 2 Number of subscriptions for mobile telephone and data services, private and corporate..... 20

Figure 3 Number of subscriptions for mobile telephone and data services - private..... 22

Figure 4 Number of subscriptions for mobile telephone and data services - corporate .. 22

Figure 5 Number of subscriptions that used 4G (LTE) 23

Figure 6 Number of subscriptions for M2M services 24

Figure 7 Development of the number of outgoing call minutes from mobile telephones 25

Figure 8 Development in the number of sent SMS in total and per subscription and month 26

Figure 9 Volume of transferred mobile data – private and corporate 27

Figure 10 Volume of mobile data transferred - private 29

Figure 11 Volume of mobile data transferred - corporate 29

Figure 12 Mobile income by fixed and variable charges 30

Figure 13 Market share - subscriptions for mobile telephone and data services 31

Figure 14 Market share - subscriptions for mobile broadband 32

Figure 15 Number of portings of mobile and fixed line telephone numbers 33

Figure 16 Number of internet subscriptions 34

Figure 17 Development of subscriptions for broadband - private and corporate 36

Figure 18 Development of subscriptions for broadband - private 37

Figure 19 Development of subscriptions for broadband - corporate 37
Figure 20 Distribution of speeds for download of data - fixed broadband 39
Figure 21 Distribution of speeds for upload of data - fixed broadband 40
Figure 22 Income from the end customer market for fixed internet services 41
Figure 23 Market share - subscriptions for broadband in total 42
Figure 24 Market share - fixed broadband subscriptions 43
Figure 25 Number of subscriptions for fixed line telephony - private and corporate 44
Figure 26 Number of subscriptions for fixed line telephony - private 47
Figure 27 Number of subscriptions for fixed line telephony - corporate 47
Figure 28 Outgoing call minutes from fixed line telephone services 48
Figure 29 Income from end customers for fixed line telephone services 49
Figure 30 Market share - fixed line telephone service subscriptions 50
Figure 31 Number of pay TV subscriptions by distribution platform 53
Figure 32 Proportion of TV subscriptions by distribution platform 54
Figure 33 Income from TV services in basic subscriptions 57
Figure 34 Market share - subscriptions to digital TV services 59
Figure 35 Number of bundled subscriptions 61
Figure 36 Income from data communication services and dark fibre to end customers .. 63

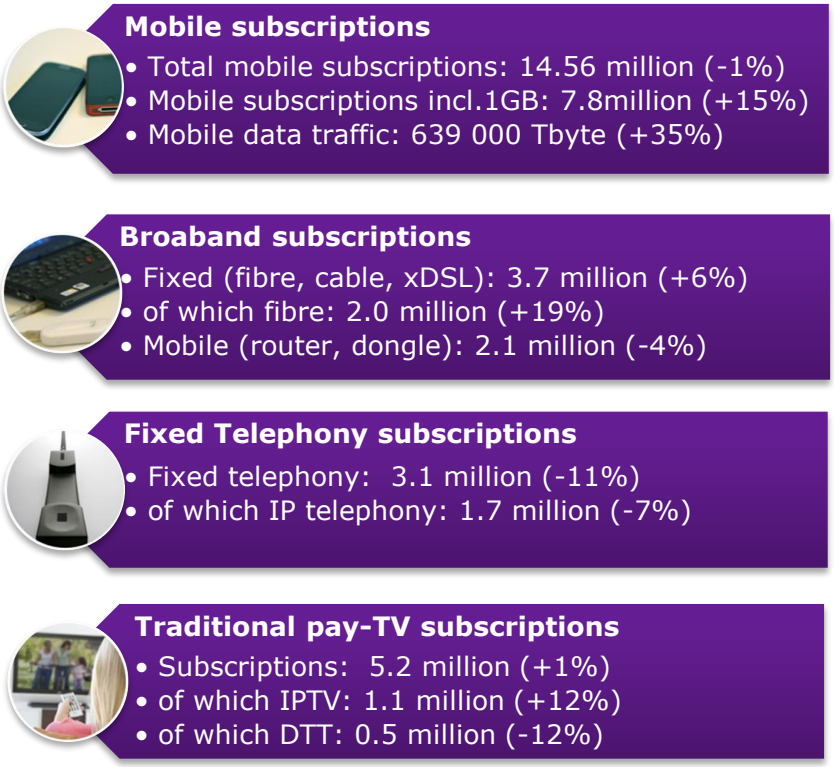
Summary of the Swedish Telecommunications Market 2016

The Swedish Post and Telecom Authority (PTS), has been tasked with tracking developments in the electronic communications market, promoting competition in that same market and inform consumers. As a part of these tasks, PTS collects and publishes market data in this report, the "Swedish Telecommunications Market" annually. The data is also used in various analysis within PTS.

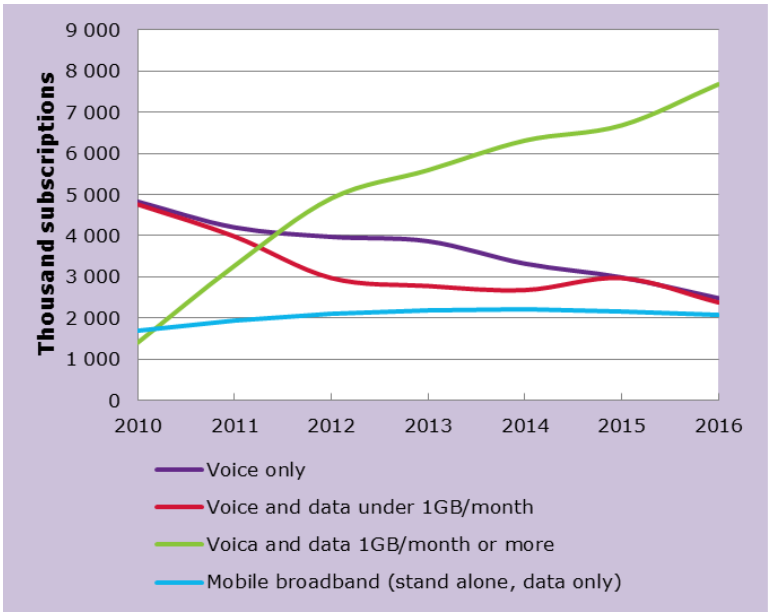
The Swedish Telecom Market report is one of Sweden's most important survey of telecom operators' subscriptions, revenues, data traffic, etc., within the areas mobile call and data services, fixed broadband, fixed telephony, traditional TV services, data communications, dark fibre and ducts. The report is based on PTS's own survey of over 550 operators, with a response rate of 95 per cent. All comparisons refer to 31 December 2016 compared to the same date in 2015.

Highlights from the 2016 report:

Compared with the results from 2015 (in brackets).



Mobile call and data subscriptions with a lot of data continue to increase while subscriptions with little data decrease



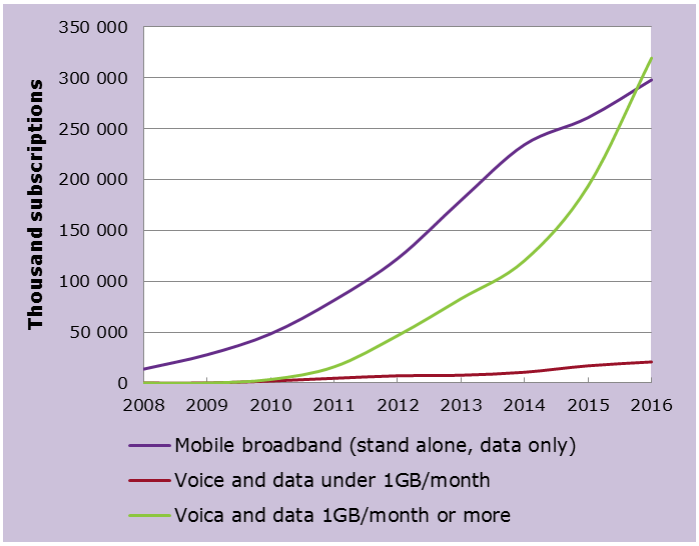
The number of subscriptions with over 1 Gbyte of data (mostly smartphones) has increased by 15 per cent to 7.7 million. Other types of mobile subscriptions decrease. Subscriptions without data and little data (under 1 Gbyte) decreased by 3 per cent to 4.8 million. Data only subscriptions continued to drop by 4 per cent, to 2.1 million.

There were a total of 14.6 million mobile subscriptions in Sweden, which is a decrease of 1 per cent.

Data traffic in the mobile networks – mainly from smartphones - continues to grow rapidly

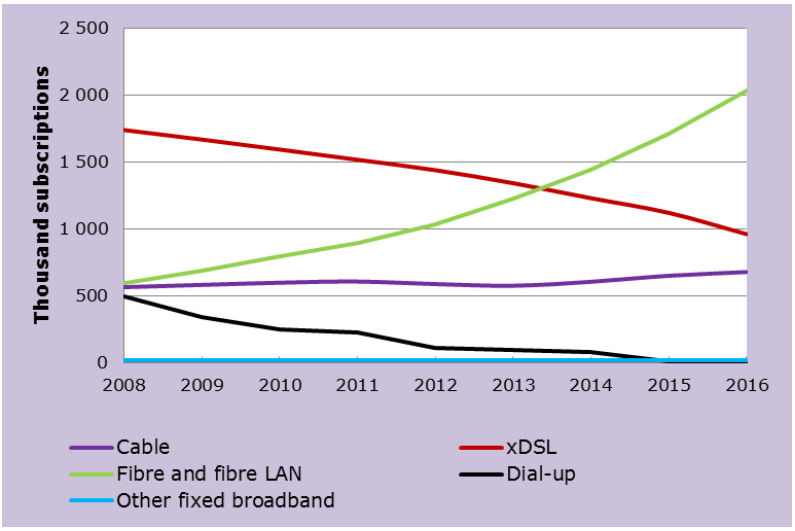
Data traffic in the mobile networks continues to increase. The amount of transferred data grew from 472 000 Tbyte to 639 000 Tbyte during 2016, an increase by 35 per cent.

For the first time, mobile call and data subscriptions with over 1 Gbyte of data (mostly smartphones) generated more data traffic than data only subscriptions. Mobile call and data subscriptions with over 1 Gbyte of data generated 320 000 Tbytes.

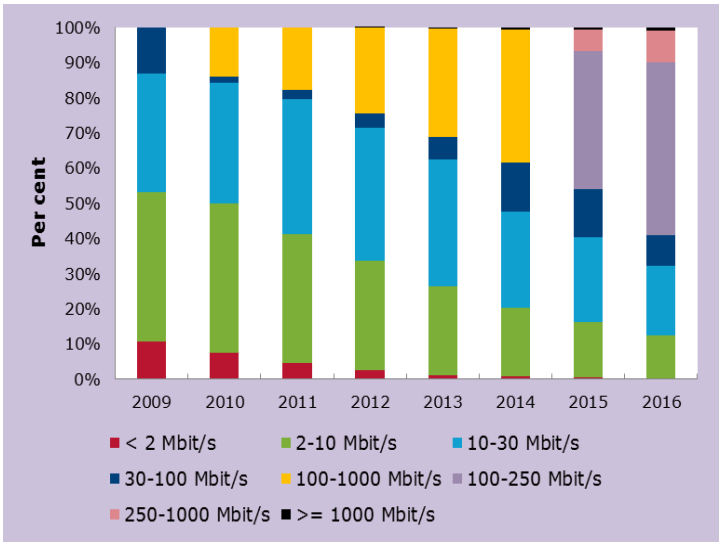


Fibre subscriptions continue to grow

There were 3.7 million fixed broadband subscriptions on, which is equivalent to a growth of 5 per cent. During recent years, fibre (including fibre LAN) that has accounted for most of the growth in fixed broadband subscriptions. The number of fibre subscriptions increased by 19 per cent, and amounted to over 2 million subscriptions for the first time.



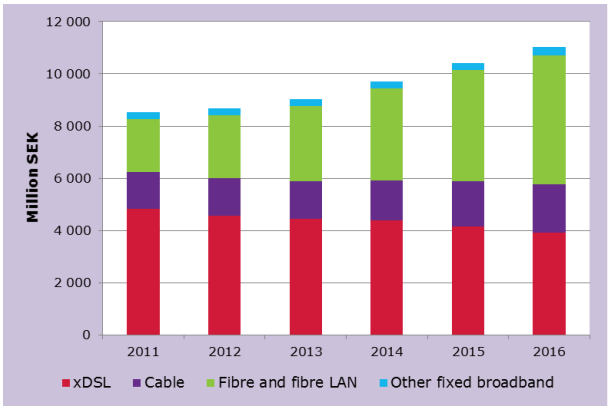
Subscription with 100 Mbit/s or more continue to increase



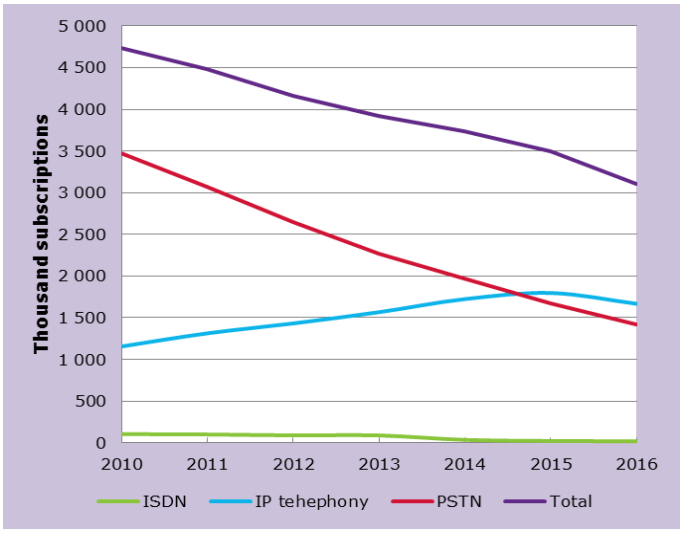
There were 2.2 million subscriptions with downstream speeds of 100 Mbps or more, which is an increase of 36 per cent. Of these subscriptions, 1.6 million were fibre subscriptions (27 per cent increase) and 0.5 million (increase of 68 per cent) were broadband subscriptions via cable.

Increase in revenues from fixed broadband, mainly fibre

Revenues from fixed broadband were SEK 11 billion – an increase of 6 per cent. The revenues from subscriptions via fibre has increased by 15 per cent.



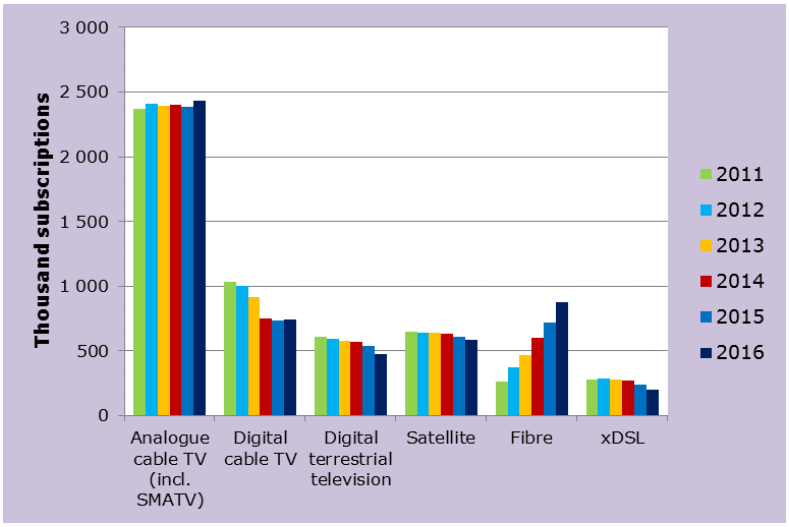
The number of IP telephony subscriptions decreases for the first time



There were a total of 3.1 million fixed telephony subscriptions, which is an 11 per cent drop, the largest decrease so far. IP telephony subscriptions accounted for over 50 per cent of all fixed telephony subscriptions. For the first time, the IP telephony subscriptions decreased, by 7 per cent, to 1.7 million.

Pay-TV subscriptions by fibre on the increase while the subscriptions by the terrestrial network decreases

There were 5.3 million subscriptions for traditional pay-TV, which is an increase by 2 per cent. TV subscriptions by fibre increased by 23 per cent to 875 000 and is now the largest digital pay-TV platform. Just over 50 per cent of these subscriptions were via landlords. There were 2.4 million analogue cable TV subscriptions, which is an increase by 2 per cent. Pay-TV subscriptions by the terrestrial network are decreasing more than before - by 12 per cent - to 475 000 subscriptions.



Would you like to know more?

Via the PTS Statistics Portal (www.statistik.pts.se/start_en) you can search for and statistics for different submarkets and services. Data and market shares are also available for individual operators.

Sammanfattning av Svensk telekommarknad 2016

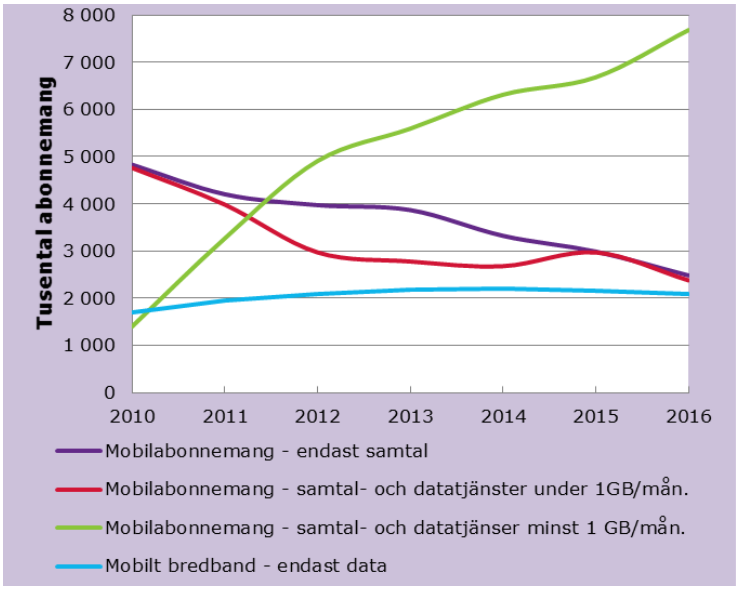
Post- och telestyrelsen (PTS) har till uppdrag att följa tjänsteutvecklingen på marknaden för elektronisk kommunikation, att främja konkurrensen inom denna marknad och att bedriva informationsverksamhet riktad till konsumenter. Som en del av dessa uppdrag arbetar PTS med att årligen samla in och publicera marknadsdata som redovisas i denna rapport, Svensk telekommarknad. Svensk telekommarknad är en deskriptiv rapport. Underlaget används i PTS arbete med analyser inom myndighetens ansvarsområden.

Svensk telekommarknad är en av Sveriges viktigaste operatörsundersökningar om abonnemang, intäkter, datatrafik inom områdena mobila samtals- och datatjänster, internet tjänster (bredband), fasta samtalstjänster, traditionella tv-tjänster, datakommunikationstjänster och svartfiber till slutkund och kanalisation. Rapporten för 2016 är baserad på Post- och telestyrelsens (PTS) egen datainsamling som undersöker 550 operatörers och andra aktörers utveckling med en svarsfrekvens på 95 procent. Alla jämförelser avser den 31 december 2016 med samma dag 2015.

Resultaten från årets undersökning i sammandrag

Värde inom parentes avser jämförelse med föregående år.

Mobilabonnemang med samtalstjänst och mycket data (smarta mobiler) fortsätter att öka medan abonnemang med lite data minskar



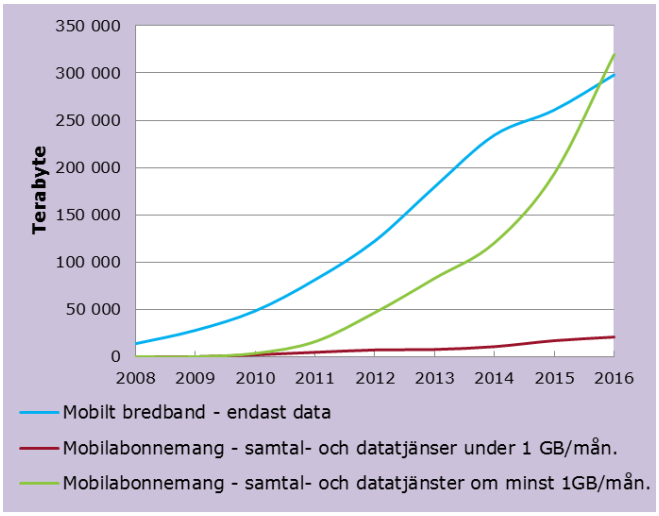
Antalet mobil-abonnemang med samtalstjänst och över 1 Gbyte data, (mestadels abonnemang för smarta mobiltelefoner) fortsätter att öka, med 15 procent till 7,7 miljoner. Men övriga mobila abonnemangs-former minskar.

Minskningen beror på följande: abonnemang med endast samtal (utan data) och abonnemang med lite data (mindre än 1 Gbyte) minskar med 3 procent till 4,8 miljoner, antalet abonnemang med mobilt bredband (endast data) minskar med 4 procent till 2,1 miljoner samt färre privata kontantkort. Sammantaget uppgick totalt antal mobila samtals- och dataabonnemang till 14,6 miljoner och visar en minskning med 1 procent.

Datatrafiken i mobilnäten fortsätter att öka kraftigt – främst från smarta mobiltelefoner

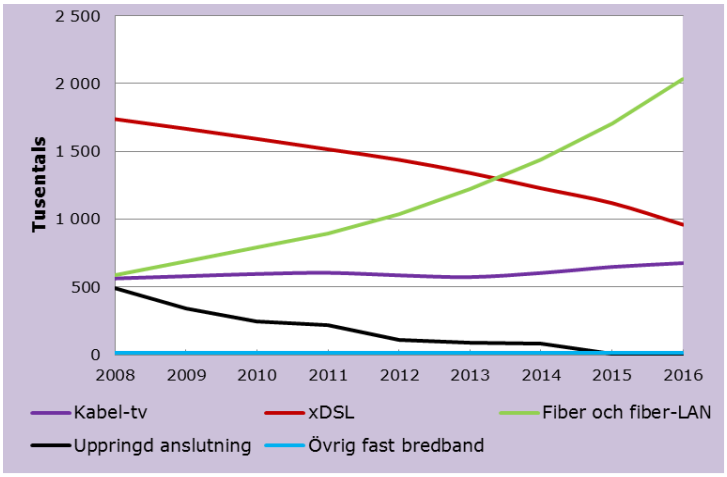
Mängden överförd data i mobilnäten fortsatte att öka, från 472 000 Tbyte till 639 000 Tbyte 2016. Det är en ökning på 35 procent.

För första gången var det abonnemang på samtals- och datatjänster med 1 Gbyte data eller mer (mestadels abonnemang för smarta mobiltelefoner) som stod för den största mängden överförd data. Dessa abonnemang genererade 320 000 Tbyte.

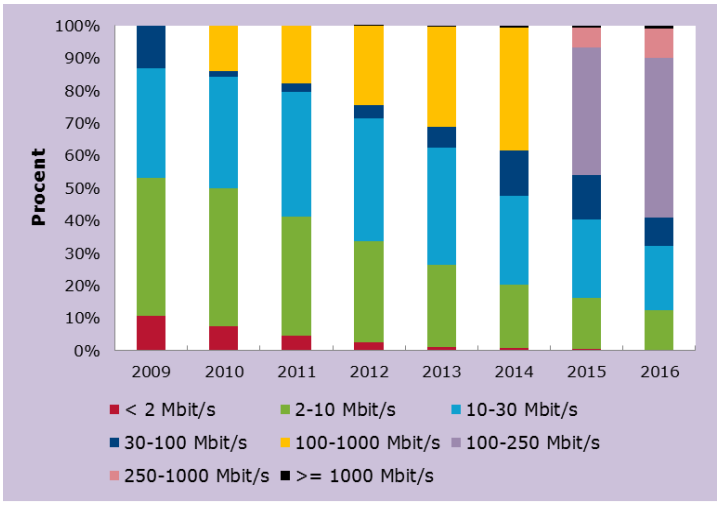


Fiberabonnemangen fortsätter att öka

Det fanns 3,7 miljoner abonnemang på fast bredband, vilket motsvarar en årlig tillväxt på 6 procent. De senaste åren är det fiber (inklusive fiber-LAN) som stått för det mesta av tillväxten av abonnemangen på fast bredband. Antalet abonnemang via fiber ökade med 19 procent och för första gången uppgick till över 2 miljoner.



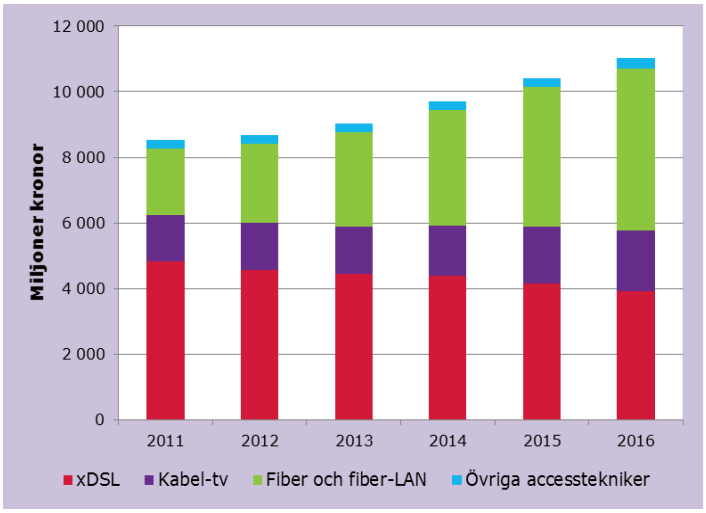
Abonnemang med 100 Mbit/s eller mer fortsätter att öka



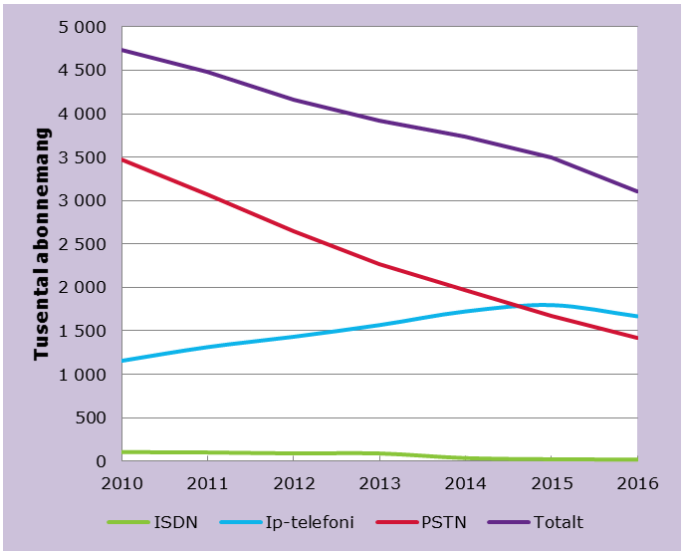
Det fanns 2,2 miljoner abonnemang med hastigheter på 100 Mbit/s eller mer vilket är en ökning med 36 procent. Av dessa var 1,6miljoner via fiber som ökade med 27 procent och drygt 0,5 miljoner via kabel-tv nätet som ökade med 68 procent.

Intäkter på fast bredband – främst via fiber - ökar

Intäkterna från fasta bredbandsabonnemang uppgick till 11 miljarder under 2016, vilket är 6 procents ökning. Intäkter från fiber-abonnemang ökade med 15 procent och stod för 45 procent av de totala intäkterna.



Antalet ip-telefoniabonnemang minskar för första gången

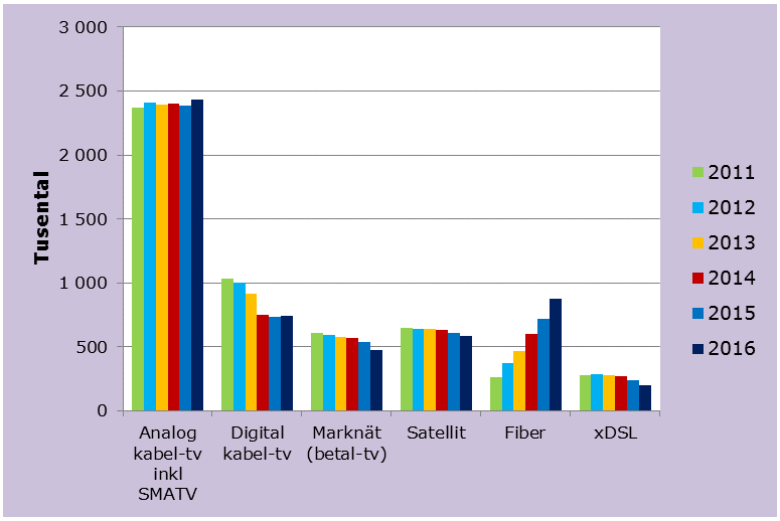


De fasta telefoni-abonnemangen minskade med 11 procent, vilket är den största årliga minskningen hittills.

Det fanns totalt 3,1 miljoner fasta telefoni-abonnemang, av vilka ip-telefoni-abonnemang utgjorde mer än hälften. För första gången sedan ip-telefoni infördes minskade dessa (-7 procent) och uppgick till 1,7 miljoner.

Tv-abonnemang via fiber fortsätter att öka medan tv-abonnemang via marknätet minskar

Totala antalet abonnemang på traditionell betal-tv uppgick till 5,3 miljoner, vilket var en ökning med 2 procent. Tv via fiber ökade med 23procent till 875 000 abonnemang och är nu den största digitala tv-plattformen. Av dessa var knappt hälften via fastighetsägare. Det fanns 2,4 miljoner analoga kabel-tv abonnemang vilket var en ökning med 2 procent. Betal-tv abonnemangen via marknätet minskar mer än tidigare (-12 procent).



Vill du veta mer?

På PTS statistikportal (www.statistik.pts.se), kan du söka och sortera statistik på de olika områdena. Där finns även data och marknadsandelar för enskilda aktörer tillgänglig.

Full year 2016: Table 1
Key data - the market for electronic communications*

	2016	2015	Change
Electronic communication			
Total retail revenues	**52 074**	**51 970**	**0%**
Revenues per month from one average household (excluding VAT)	**614**	**612**	**0%**
Mobile call services and mobile data			
Mobile subscriptions (thousands)	**14 623**	**14 798**	**-1%**
Private	11 043	11 354	-3%
Business	3 579	3 443	4%
of which subscriptions which have used 4G (LTE)	7 482	6 129	22%
of which dedicated data subscriptions for stand-alone services	2 079	2 159	-4%
of which standard mobile subscriptions with 1Gbyte data or more	7 683	6 682	15%
Outgoing traffic minutes (millions)	**31 705**	**29 675**	**7%**
of which GSM-networks	7 308	9 694	-25%
of which UMTS-networks	24 252	19 458	25%
of which NMT-networks			
of which unknown	145	523	-72%
Number of SMS sent (millions)	**9 047**	**9 815**	**-8%**
Number of MMS sent (millions)	**444**	**408**	**9%**
Traffic for mobile data services (Tbyte)	**638 522**	**471 619**	**35%**
of which traffic in 4G network	444 532	270 163	65%
Revenues from mobile subscriptions, SMS, MMS and mobile data traffic (SEKm)	**30 228**	**29 578**	**2%**
Private	20 839	20 241	3%
Business	9 389	9 337	1%
M2M-subscriptions	**8 655**	**6 775**	**28%**
Internet services			
Internet subscriptions (thousands)	**13 447**	**12 332**	**9%**
Dial-up subscriptions [1]	5	5	-10%
Broadband subscriptions	3 680	3 486	6%
via cable television	676	648	4%
via fiber and fiber-LAN	2 029	1 705	19%
via xDSL	959	1 118	-14%
Mobile broadband subscriptions	9 762	8 841	10%
of which dedicated data subscriptions for stand-alone services	2 079	2 159	-4%
of which standard mobile subscriptions with 1Gbyte data or more	7 683	6 682	15%
Broadband subscriptions via collective agreement	628	457	38%
Revenues from fixed Internet subscriptions (SEKm)	**11 024**	**10 413**	**6%**
Private	9 006	8 526	6%
Business	2 018	1 887	7%

Fixed call services			
Subscriptions for fixed telephony *(thousands)*	**3 104**	**3 492**	**-11%**
of which via IP-telephony *(thousands)*	**1 669**	**1 798**	**-7%**
of which non-acitive subscriptions *(thousands)*	**443**		
Outgoing traffic minutes *(millions)*	**8 317**	**9 755**	**-15%**
Private	3 069	4 013	-24%
Business	5 248	5 742	-9%
Revenues from fixed call services *(SEKm)*	**6 482**	**7 426**	**-13%**
Private	3 567	4 154	-14%
Business	2 914	3 272	-11%
TV services			
Total number of subscriptions on television (thousands)	**5 304**	**5 216**	**2%**
Number of digital television subscriptions	**2 873**	**2 832**	**1%**
via digital cable television	745	734	1%
via digital terrestrial television	475	538	-12%
via satellite	583	607	-4%
via iptv	1 070	952	12%
via fiber and fiber-LAN	875	714	23%
via xDSL	195	238	-18%
Number of analogue television subscriptions	**2 430**	**2 384**	**2%**
via analogue cable television	2 219	2 180	2%
via SMATV	211	204	3%
Revenues pay-TV-services *(SEKm)*	**9 846**	**9 739**	**1%**
Data communications services			
Revenues from data communications services to end-users *(SEKm)*	**4 340**	**4 554**	**-5%**
IP VPN	3 029	3 051	-1%
Network capacity	611	660	-7%
Dark fibre	519	588	-12%
Wavelengths to end users	44	46	-4%
Other refined network services to end users	137	209	-34%
Bundled services			
Number of bundled subscriptions *(thousands)*	**1 637**	**1 738**	**-6%**

Source: The Swedish Post and Telecom Authority, May 22, 2017.

* The above table is based on the survey Swedish Telecommarket 2016. Questions: 6, 7, 9, 10, 18, 21, 22, 24, 25, 35, 37, 40, 41, 43. See the questionnaire under Documents: http://statistik.pts.se/pts2016e/

[1] From 2015 ISDN is not included only PSTN.

1 Introduction

Purpose and assignment

The Swedish Post and Telecom Authority (PTS) has been tasked with monitoring service developments in the market for electronic communication, promoting competition within this market and providing information aimed at consumers. As a part of this assignment, PTS annually collects and publishes market data in this report, The Swedish Telecommunications Market. The Swedish Telecommunications Market is a descriptive report. The data is used in PTS' analysis work within the authority's area of responsibility.

About the survey

As in previous years, the report for 2016 is based on PTS' own data collection, which covers developments at some 550 operators and other stakeholders.

The statistics for 2016 have been collected with the aid of an online questionnaire. The selection was based partly on the selection of organisations in previous years and partly on organisations of which PTS has been notified according to the Act (2003:389) regarding electronic communication (LEK). Data collection occurred during the period January to April 2017, and the initial contact was followed up with reminders by e-mail. Some companies that did not respond also had a telephone reminder. The questionnaire was sent to 550 organisations, 518 of which answered all questions in the survey. A further four organisations began to answer the questionnaire but did not finish it. The response rate was 95 per cent.

However collection and adjustment of operator data continues after the report the Swedish Telecommunications Market has been published, so that the PTS database for operator statistics is always updated. All figures refer to the situation on 31 December 2016, and comparisons are made with the same date in 2015 unless otherwise stated.

This year's report also shows the division into private and corporate subscriptions. The private subscriptions also include subscriptions of sole trader companies (that are registered with a personal ID number).

Unless otherwise stated, the information comes from PTS operator statistics. Another source, that is used for data on number porting, is the Swedish Number Portability Administrative Centre (SNPAC).

About the report

The report describes the results in the sections:

2 Income in the market
3 Mobile services
4 Internet services (broadband)
5 Fixed line telephone services
6 TV services
7 Packaging
8 Data communication services and dark fibre to end customers
9 Ducting

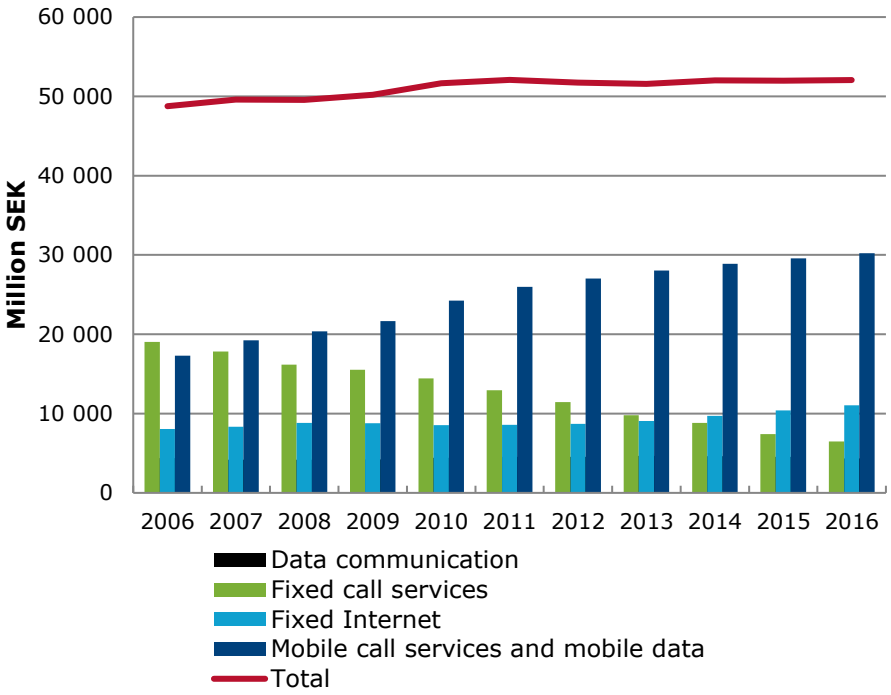
A number of appendices also cover: 1 methods and definitions, 2 list of participants, 3 changes, 4 report tables and 5 quality declaration.

On the PTS statistics portal (www.statistik.pts.se), under the tab "Swedish Telecommunications Market" the market shares of all those who received questionnaires is shown. There are market shares by income, traffic and subscriptions for the full years 2006-2016.

2 Income in the market

In 2016, income in the end user market for electronic communication (mobile telephone and data services, internet services (broadband), fixed-line telephone services and data communication services and dark fibre to end users) amounted to approximately SEK 52.1 billion, which is the same as the previous year. Total income in the end user market has been stable at this level for the last five years.

Figure 1 End user market income for electronic communication



The average income[1] generated per household per month in 2016 was SEK 614, which is almost the same as in 2015 (SEK 2 more). The average income per months includes fixed telephone services, SEK 66, mobile phone and data service, SEK 383, and internet services (excluding mobile) of SEK 165.

[1] Average income is calculated as income for the year divided by the average number of subscriptions per household

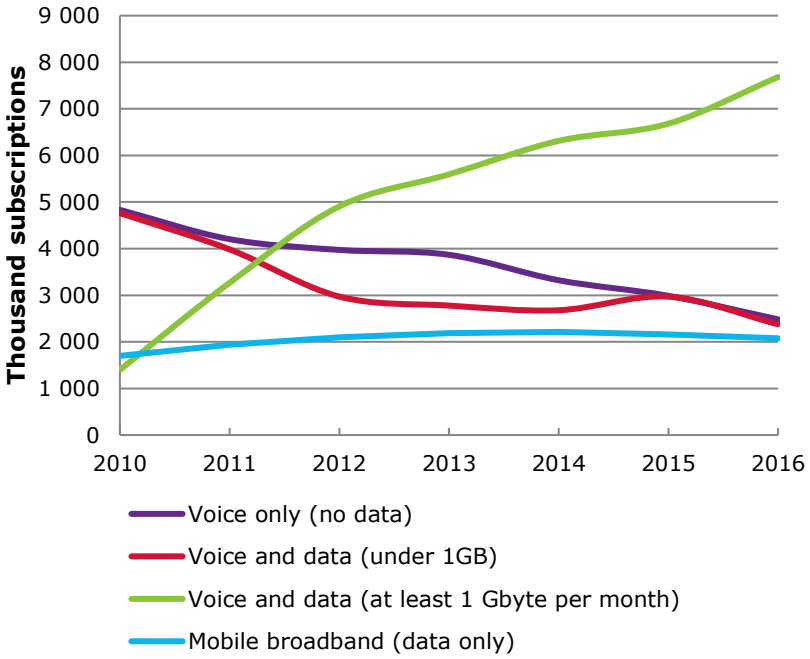
3 Mobile telephone and data services

All figures below refer to the situation on 31 December 2016, and comparisons are made with the same date in 2015.

3.1 Subscriptions - Mobile telephone and data services

At the end of December 2016 there were 14.6 million active subscriptions for mobile telephone and data services in Sweden. There is a trend towards reduction, by 1 per cent compared with a year earlier, which corresponds to 175,000 subscriptions. This is the first time since PTS began to collect statistics on the market that a reduction in the number of mobile telephone and data service subscriptions has decreased. This reduction is due to fewer private prepaid subscriptions and fewer mobile subscriptions without data or with less than 1 Gbyte per month of data. It is primarily three operators that reported fewer subscriptions: Tele2 reported 176,000 fewer, Lycamobile 93,000 fewer and Mundio Mobile 55,000 fewer than the previous year.

Figure 2 Number of subscriptions for mobile telephone and data services, private and corporate



Mobile subscriptions (postpaid, here called contract subscriptions) increased by 2 per cent to 10.9 million, while the number of prepaid decreased by 9 per cent

to 3.7 million. The proportion of prepaid has fallen over the last decade and represented 26 per cent of all subscriptions in 2016. The corresponding figure was 57 per cent ten years ago.

Fewer mobile subscriptions for voice only, without data

The number of mobile subscriptions for voice services only was 2.5 million, which represents a reduction of 17 per cent.

The number of mobile subscriptions with little data (less than 1Gbyte (GB) per month) is falling

The number of mobile subscriptions with both voice and data services that included less than 1Gbyte was 2.4 million. This is a reduction of 20 per cent.

Mobile subscriptions with 1 Gbyte (GB) or more per month continue to increase

The number of mobile subscriptions with both voice and 1 Gbyte a month or more of data services (mainly smartphones) continued to increase and amounted to 7.7 million, which is an increase of 15 per cent.

Mobile broadband subscriptions with only data continue to fall

There were 2.1 subscriptions for mobile broadband with telephone services[2] which is a reduction of 4 per cent. These subscriptions are used for dongles or mobile routers.

Number of subscriptions for voice and data services, by private and corporate

The figures below show the number of subscriptions by private and corporate subscribers. Subscriptions with only voice services and subscriptions with voice and data services of less than 1 Gbyte used to be common among private user, but have fallen considerably in recent years.

[2] Subscriptions that have only been used for data and not generated any telephone traffic at all in the last quarter of the period.

Figure 3 Number of subscriptions for mobile telephone and data services - private

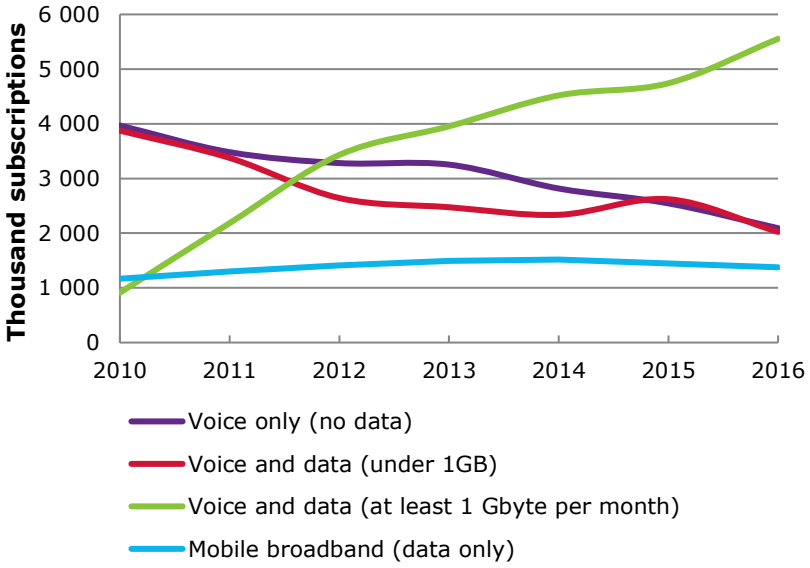
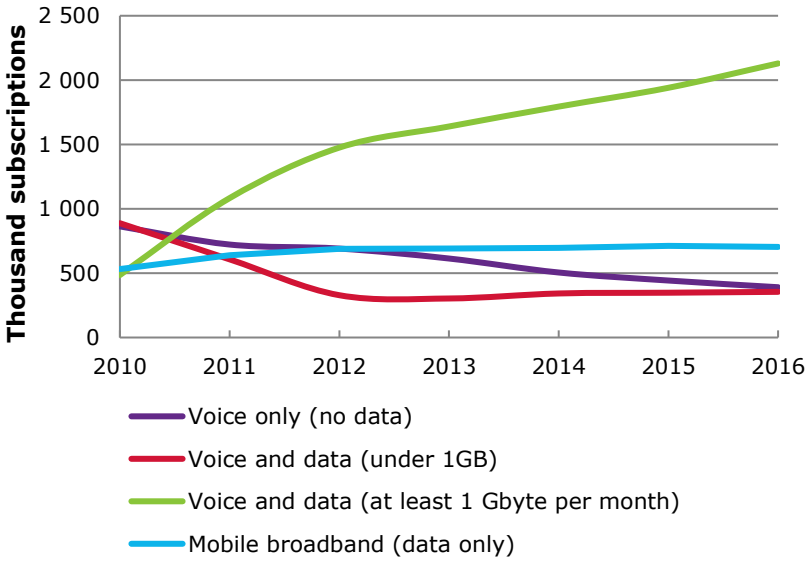


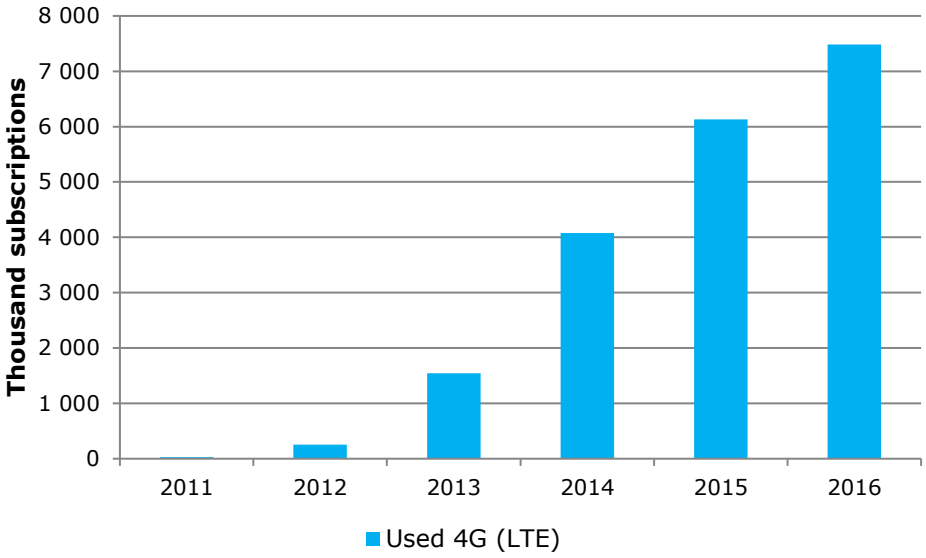
Figure 4 Number of subscriptions for mobile telephone and data services - corporate



Subscriptions that have used 4G (LTE)

There were 7.5 million subscriptions that had used services in the 4G (LTE) network, which is an increase of 22 per cent.[3] This represents about 62 per cent of all subscriptions that include data. At present 4G is only used for mobile data. But some operators (Telia Company and Hi3G) have introduced VoLTE, voice over LTE, in Sweden in early 2017.

Figure 5 Number of subscriptions that used 4G (LTE)

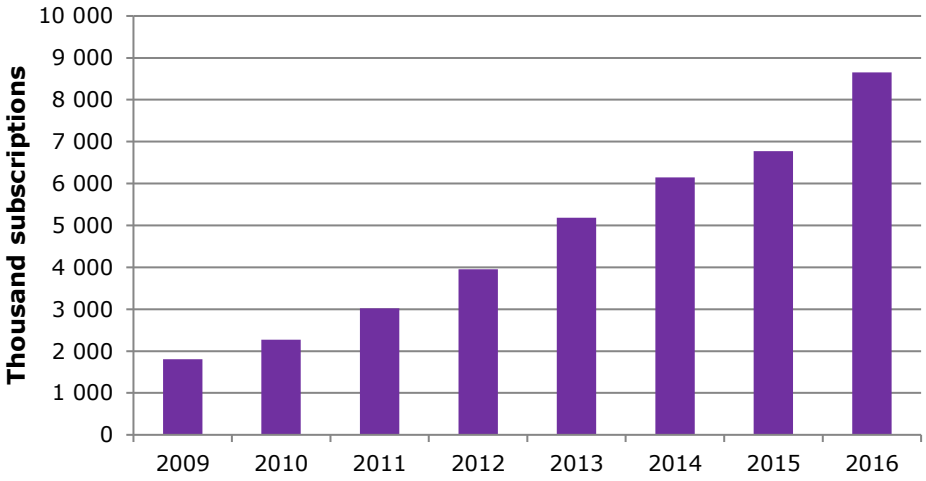


3.2 Subscription - M2M-services

This refers only to the M2M subscriptions that use mobile numbers and telematics numbers. The number of subscriptions for services for M2M was 8.7 million, which is an increase of 28 per cent. Telenor Connexion and Telenor had 80 per cent of the M2M subscriptions and Telia Company 10 per cent.

[3] To be able to use the 4G network, a user must have both a SIM card and a terminal that can handle 4G. It is also necessary to subscribe to a service to gain access to the network.

Figure 6 Number of subscriptions for M2M services



3.3 Call traffic – Mobile telephone services

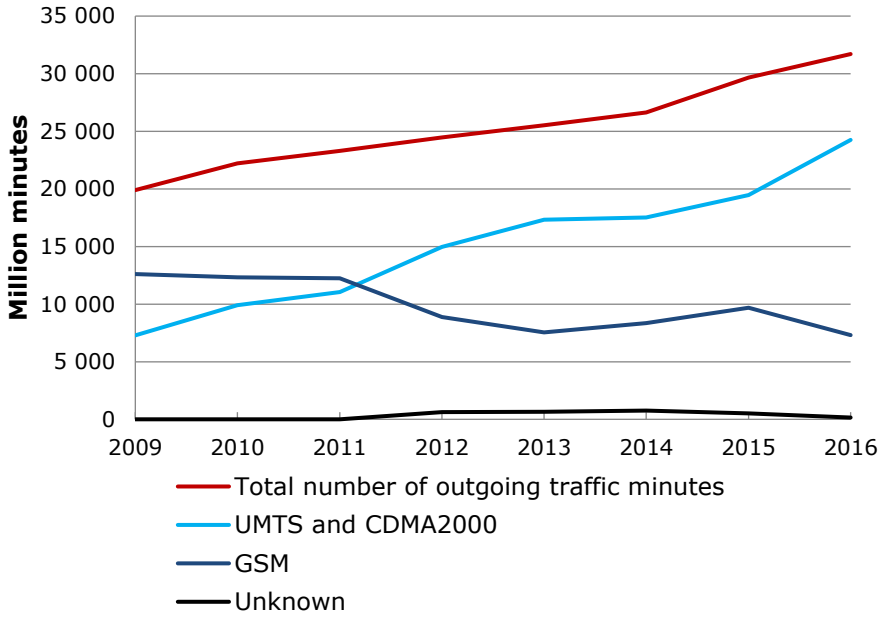
The total number of outgoing call minutes in 2016 was 40.0 billion, an increase of 2 per cent over the previous year. Call minutes from mobile subscriptions account for an increasing proportion of the total call minutes and amounted to 79 per cent of all outgoing call traffic, compared with 75 per cent in the same period the previous year.

The number of outgoing call minutes from mobile telephones increased by 7 per cent to 31.7 billion. The number of outgoing call minutes per mobile subscription increased by 6 per cent to 210 minutes per month.

10.2 billion calls were made from mobile subscriptions, which is an increase of 2 per cent. The average number of private calls was also at the same level as the previous year, at 67 calls per month. The length of calls from private mobile subscriptions was 3.1 minutes on average, which is unchanged from the previous year.

Figure 7 shows the development of the number of outgoing call minutes by mobile network, UMTS, GSM and unknown. Unknown means that the operator has not reported a distribution by mobile network.

Figure 7 Development of the number of outgoing call minutes from mobile telephones



3.4 Number of SMS and MMS

SMS

In 2016 about 9.0 billion SMS texts were sent from mobile telephones, which is a reduction of 8 per cent compared with the previous year.

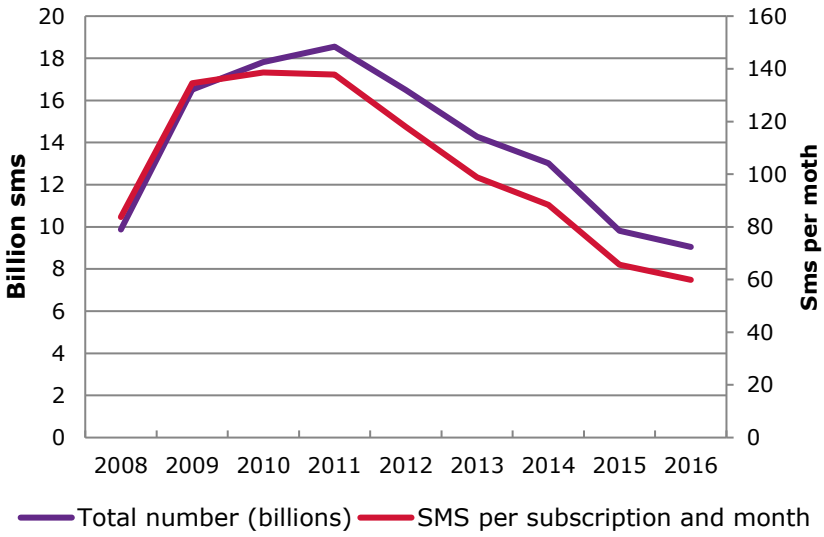
The previous Swedish Telecommunications Market reports for 2015 and the first half of 2016 show however that the number of SMS levelled out during 2015 and the first half of 2016. However in connection with its reporting to Swedish Telecommunications Market 2016, Tele2 changed its historical figures for 2015 and the first half of 2016. Tele2 amended the number of SMS sent in 2015 from 6.3 billion as previously reported to 2.9 billion, and for the first half of 2016 from 3.7 to 1.5 billion.

Thus the reduction in the number of SMS that began in 2011 has continued into 2016. The reduction in SMS volume may be because other message services such as iMessage and WhatsApp, KiK etc. are increasing in popularity.

SMS from private subscribers account for most of the traffic and amounted to 7.9 billion, which was a reduction of 9 per cent.

On average there were 60 SMS per subscription per month, compared with 66 the previous year.

Figure 8 Development in the number of sent SMS in total and per subscription and month



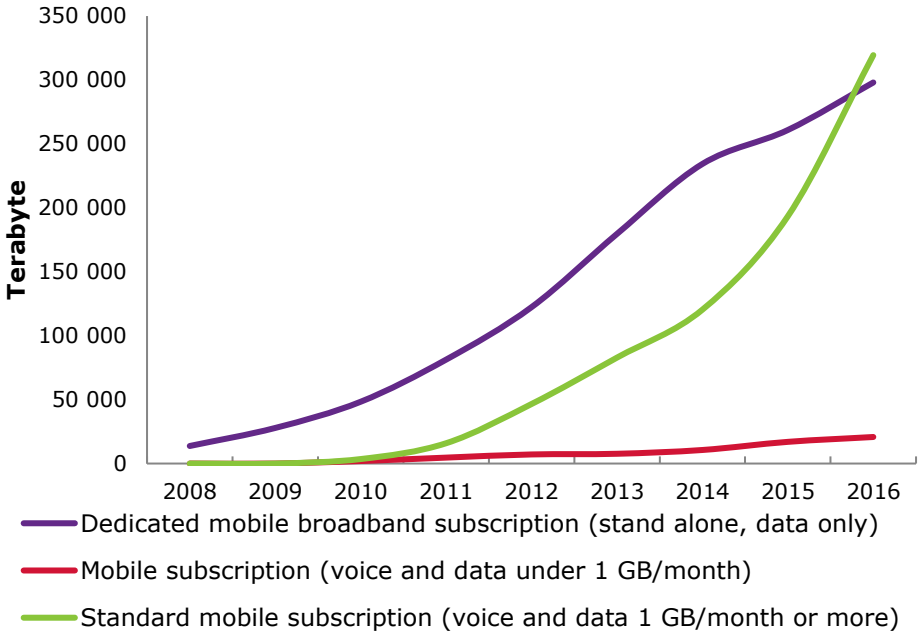
MMS

The number of MMS messages sent increased to 400 million. This is an increase of 28 per cent. The average number of private MMS sent per subscription per month increased to 3.1 from 2.9.

3.5 Data traffic in mobile networks

The volume of data transferred in mobile networks continues to increase, from 472,000 Tbyte to 639,000 Tbyte in 2016. This is an increase of 35 per cent. The rate of increase in previous years has also been around 30 per cent. The five network operators have the following share of total data traffic: Telenor (28 %), Tele2 (27 %), Telia Company 22 %), Hi3G (21 %) and Nett1 (2 %).

Figure 9 Volume of transferred mobile data – private and corporate



For the first time, it was mobile subscriptions for voice and data services of at least 1 Gbyte per month (in practice smartphones) that accounted for the greatest volume of data. Data volume increased by 65 per cent and amounted to 320,000 Tbyte. This was half of all data transferred in mobile networks.

In previous years mobile broadband subscriptions (without voice, usually with a dongle or router) accounted for the highest volume. The volume of data generated by this type of subscription amounted to 298,000 Tbyte, which is an increase of 22 per cent.

Data traffic from subscriptions for mobile voice and data services with less than 1 Gbyte of data per month amounted to 21,000 Tbyte, which is an increase of 22 per cent.

The total data traffic in the 4G network amounted to 440,000 Tbyte, which was 70 per cent of total data traffic in mobile networks.

The average monthly usage of subscriptions for mobile telephone and data services with 1 Gbyte or more of data per month was almost 4 Gbyte per

month, which was an increase of 49 per cent. The average monthly usage of various types of subscriptions for mobile data services is shown below.

Table 1 Average volume of data used per month

Type of subscription (Gbyte)	Data volume (Gbyte/month)	Increase
Dedicated mobile broadband (data only, stand alone service)	11.7	18%
Private	13.9	17%
Corporate	7,4	25%
Standard mobile subscription (voice and 1Gbyte data or more)	3.7	49%
Private	4.5	52%
Corporate	1.8	34%
Mobile subscription (voice and less than 1Gbyte data)	0.6	29%
Private	0.6	28%
Corporate	0.7	39%

Data traffic in mobile networks by private and corporate

The figure below shows data traffic in mobile networks by private and corporate. One difference is that in the private sector more data was transferred via subscriptions for telephone and data services of at least 1 Gbyte per month (smartphones) in 2016, while in the corporate sector most was transferred via mobile broadband (data only).

Figure 10 Volume of mobile data transferred - private

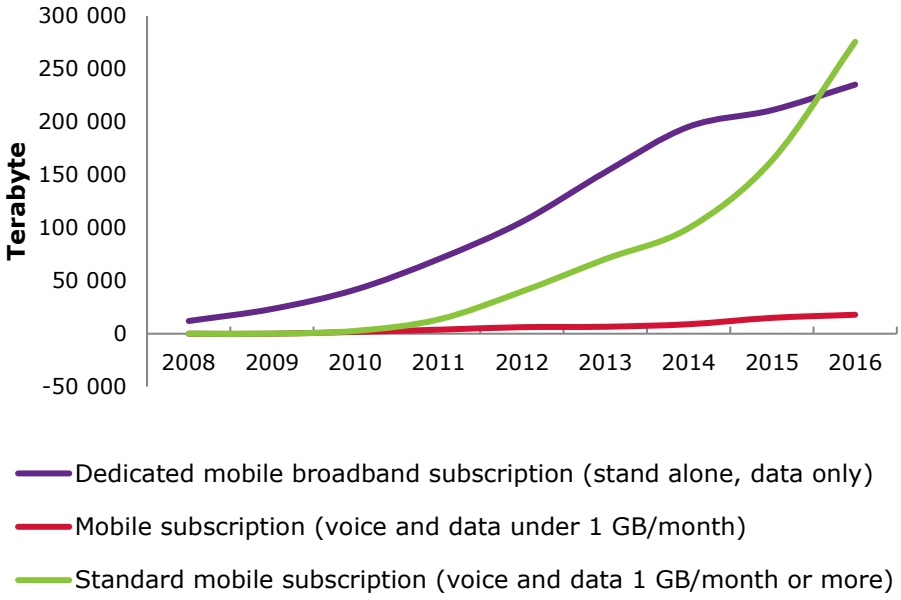
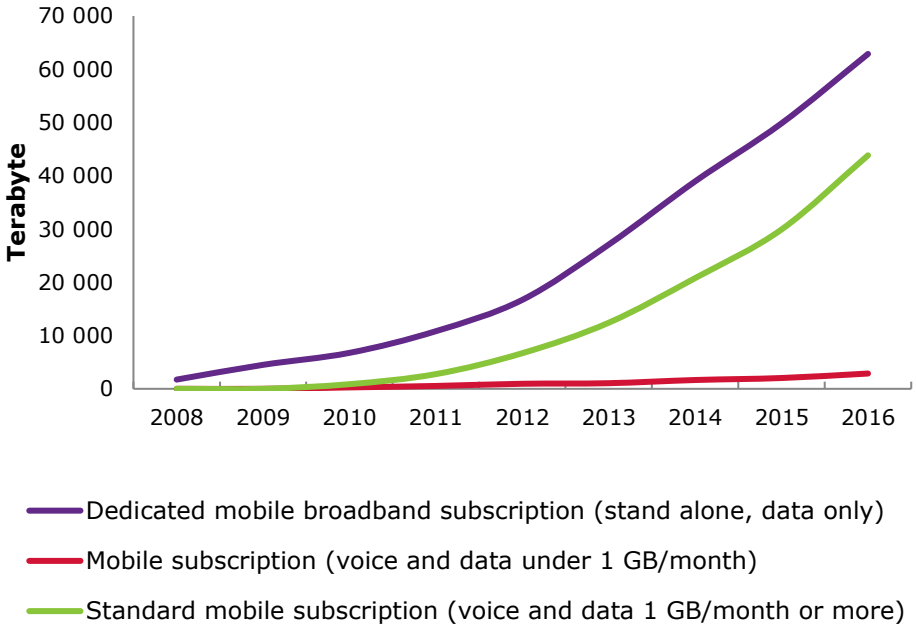


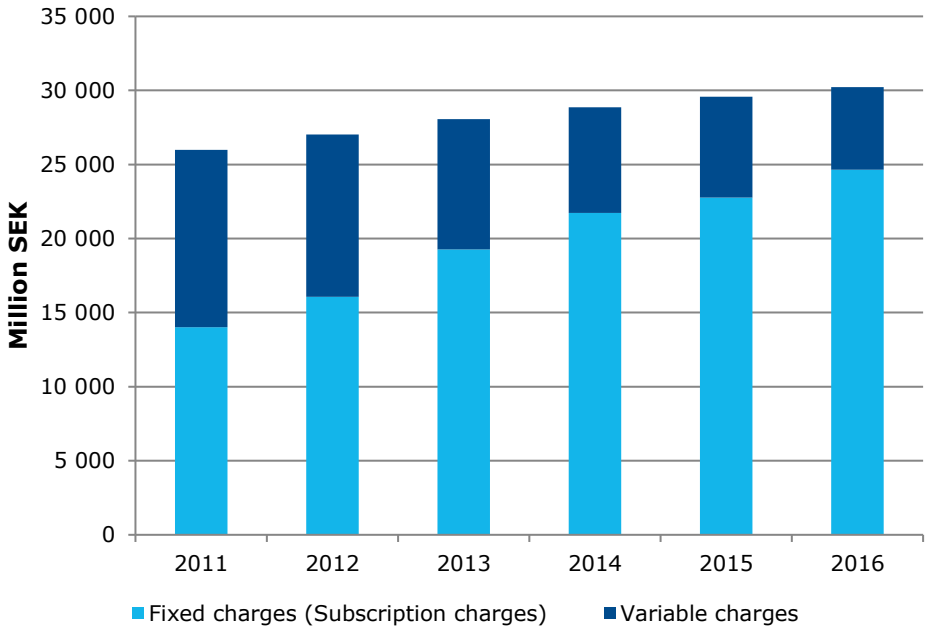
Figure 11 Volume of mobile data transferred - corporate



3.6 Income for mobile telephone and data services

Income for mobile telephone and data services increased by 2 per cent to SEK 30.2 billion. The income is partly from fixed charges (subscription fees) and partly from variable charges.

Figure 12 Mobile income by fixed and variable charges



Income from fixed charges amounted to SEK 24.7 billion in 2016, an increase of 8 per cent. The variable charges generated SEK 5.6 billion in income, which is an increase of 18 per cent.

Fixed charges (for calls, data, SMS etc.) account for an ever increasing share and amounted to almost 82 per cent of the total income from mobile telephone and data services. This trend is connected with the transfer to data-based business models.

PTS no longer collects information about income divided into calls, data, SMS and MMS.

3.7 Income for M2M

Income from M2M services amounted to SEK 908 million, which is an increase of 5 per cent. The average income per subscription per month was SEK 10, which is SEK 1 less than the previous year.

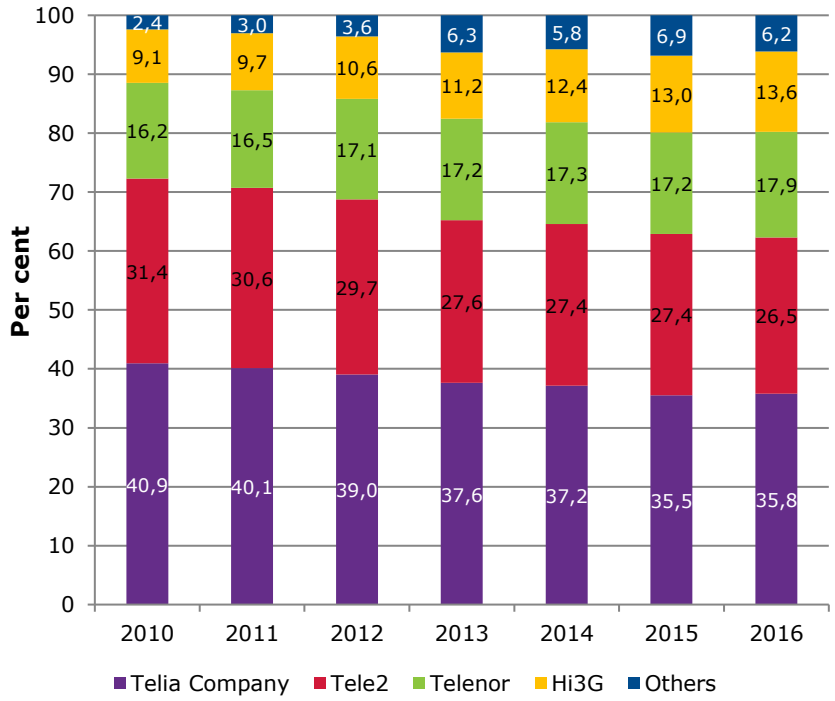
3.8 Income for interconnection in mobile networks

Interconnection means that a call is made from a fixed line or mobile network and then terminated in another fixed line or mobile network. Calls that are made within the same network are not counted as interconnection. For this reason, the total volume of interconnection minutes is less than the total volume of outgoing traffic minutes.In 2016, 14.1 billion minutes were terminated in the mobile networks, an increase of 9 per cent over 2015, when 13 billion minutes were terminated. Interconnection income from mobile telephony amounted to almost SEK 1 billion in 2016, which is the same level as in 2015. The average income per minute for termination of incoming mobile traffic from national operators was SEK 0.074, a decrease of SEK 0.008 compared with the year before.

3.9 Market share - mobile telephone and data services

The market shares in mobile telephone and data services include all mobile subscriptions, but not M2M subscriptions. The four largest companies, Telia Company, Tele2, Telenor and Hi3G (3), had 94 per cent of all subscriptions between them.

Figure 13 Market share - subscriptions for mobile telephone and data services



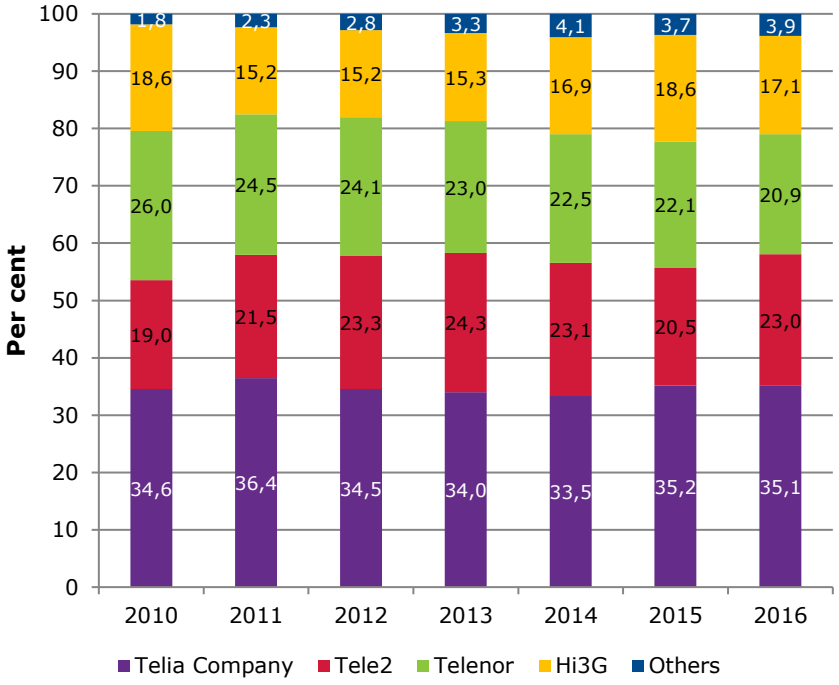
Tele 2 (excluding TDC) lost market share from 27.4 to 26.5 per cent. Hi3G continued to increase its market share, from 13.0 per cent to 13.6. With 2 per cent of the subscription market, Lycamobile was the biggest in the "others" category, although its market share was reduced from 3.0 per cent. In the "others" category, TDC (acquired by Tele2 in 2016) increased to 1.3 per cent.

In The Swedish Telecommunications Market, brands are not compared, so Hallon for example is included in Hi3G and Halebop is included in Telia Company.

3.10 Market share - Mobile broadband

The market share for mobile broadband is based on mobile subscriptions for data alone and mobile telephone and data services with at least 1Gbyte of data. The four largest companies, Telia Company, Tele2, Telenor and Hi3G accounted for 96 per cent of all subscriptions between them.

Figure 14 Market share - subscriptions for mobile broadband

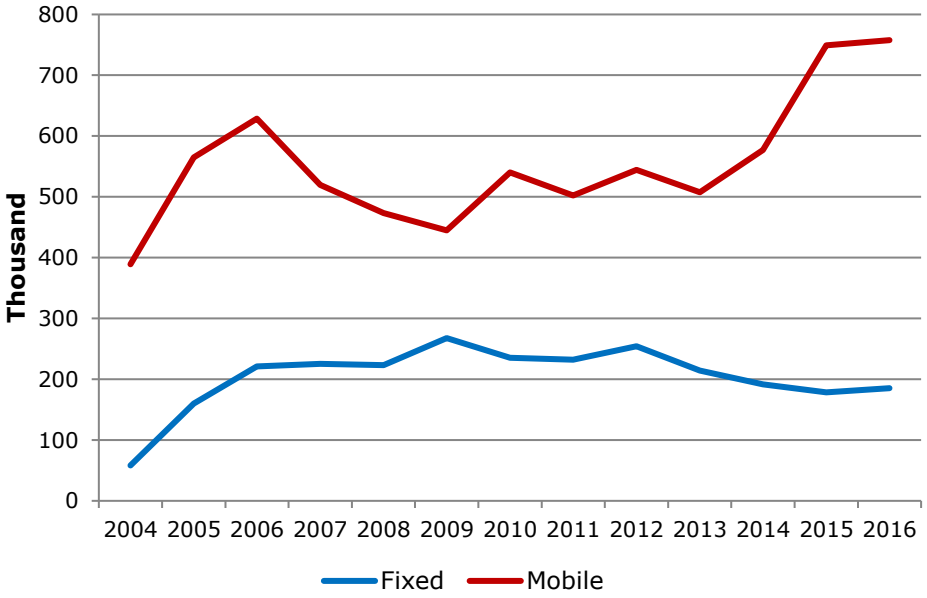


Tele2 increased its market share by 2.5 percentage points to 23.0 per cent, while Telenor fell to 20.9 and Hi3G fell to 17.0 per cent. The other operators' combined market share increased from 3.7 to 3.9 per cent. Largest of the other operators was Net1 with 2 per cent of the market.

3.11 Number porting – Mobile numbers

Number porting is when telephone numbers are moved from one operator to another. The Swedish Number Portability Administrative Centre, SNPAC[4] , collects and publishes statistics on the number of portings in Sweden. The following section is based on data from SNPAC. The number of mobile numbers that were ported amounted to 826,000 at end December 2016, which is an increase of 3 per cent. The SNPAC statistics do not include figures for fixed line numbers. For this reason the number of porting instances is shown below, which is lower than the number of ported telephone numbers.

Figure 15 Number of portings[5] of mobile and fixed line numbers



The number of porting instances for mobile numbers amounted to 749,000 in Sweden, which was the same level as the previous year. The number of ported mobile numbers represented 6 per cent of the total number of mobile subscriptions (excluding mobile broadband with only data services and M2M).

The proportion of porting instances relating to mobile numbers was 80 per cent, while fixed line telephone numbers accounted for 20 per cent. See section 5.6 for porting of fixed line numbers.

[4] www.snpac.se

[5] The figure shows the number of porting instances. The number of ported numbers may be higher than the number of porting instances.

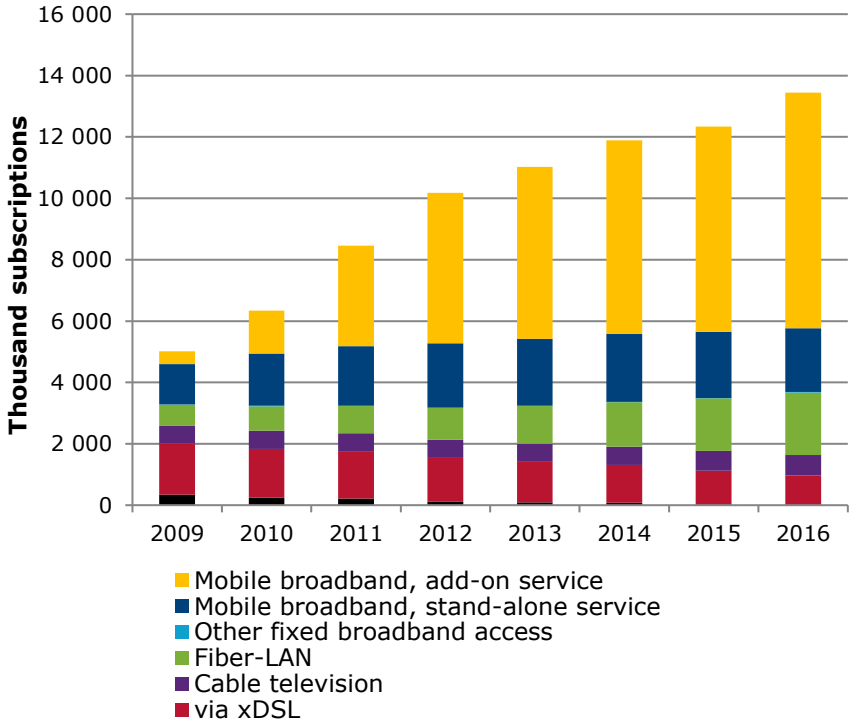
4 Internet services

All information below refers to 31 December 2016, and comparisons are made with the same date in 2015.

4.1 Subscriptions - Internet services

At end December 2016, the total number of subscriptions for internet services was 13.4 million, which is an increase of 9 per cent. Internet services include dial-up connections, fixed broadband (via cable TV, fibre and fibre LAN, xDSL and other fixed connections), mobile broadband with data alone and mobile telephone and data services. Developments for mobile broadband have been reported in section 3.

Figure 16 Number of internet subscriptions



Dial-up internet The number of subscriptions for dial-up internet fell by 10 per cent to 5,000. With effect from 2015, dial-up internet via ISDN is not included, only via PSTN.

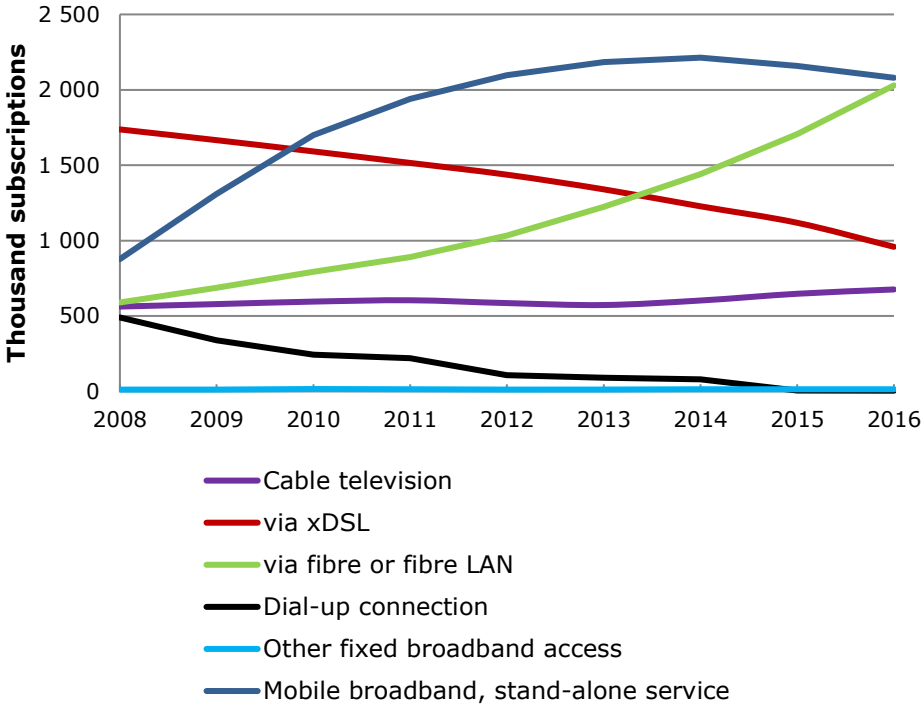
Subscriptions for fixed broadband

There were 3.68 million subscriptions for fixed broadband, which corresponds to an annual growth of 6 per cent.

Since 2010, fibre (including fibre LAN) has accounted for most of the growth of fixed broadband subscriptions. The number of subscriptions via fibre increased by 19 per cent and amounted to 2.02 million. Subscriptions for fibre and fibre LAN now represent more than half (55%) of all fixed broadband subscriptions. The four largest providers by number of fibre and fibre LAN subscriptions are Telia Company, Telenor, Bredband2 and Bahnhof which together accounted for 75 per cent of all subscriptions.

The number of subscriptions for xDSL continued to fall. They amounted to 960,000, which was a fall of 14 per cent. The number of subscriptions for broadband via cable TV networks amounted to 670,000, which was an increase of 4 per cent. Com Hem accounted for 93 per cent of all cable TV subscriptions. "Other fixed broadband subscriptions" remained at 15,000. "Other fixed broadband subscriptions" includes fixed radio, satellite and other fixed broadband connections. The number of subscriptions for fixed radio amounted to 8,000, which was an increase of 34 per cent. There were 600 broadband subscriptions via satellite, which was an increase of 200.

Figure 17 Development of subscriptions for broadband - private and corporate



Development of subscriptions for broadband by private and corporate

The figures below show that the development of various access technologies is very different in the private and corporate sectors. In the private sector, fibre and fibre LAN are clearly the most common, while mobile broadband with data alone fell considerably. On the corporate side, mobile broadband with data alone is clearly the most common and xDSL the second most common access technology.

Figure 18 Development of subscriptions for broadband - private

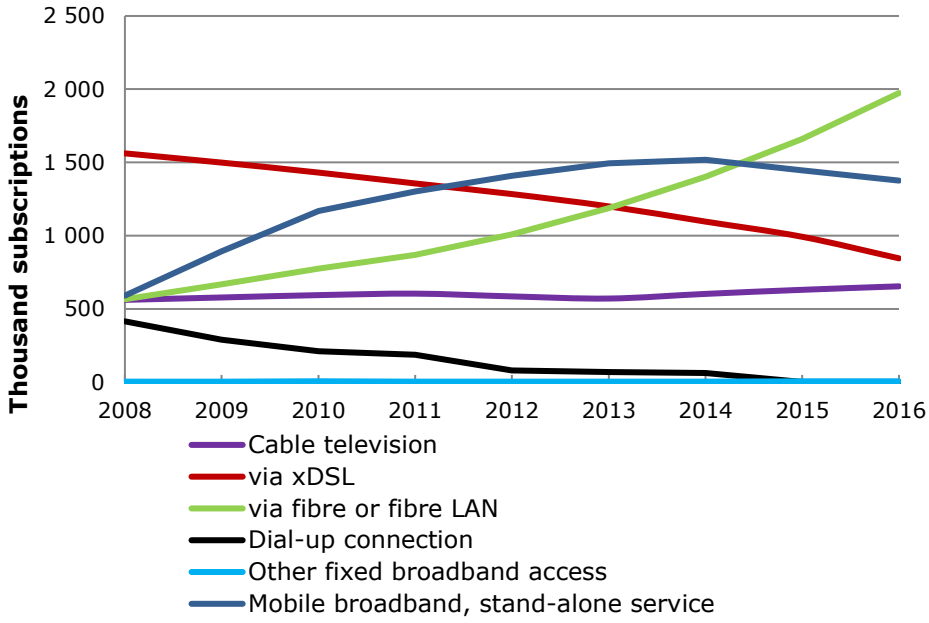
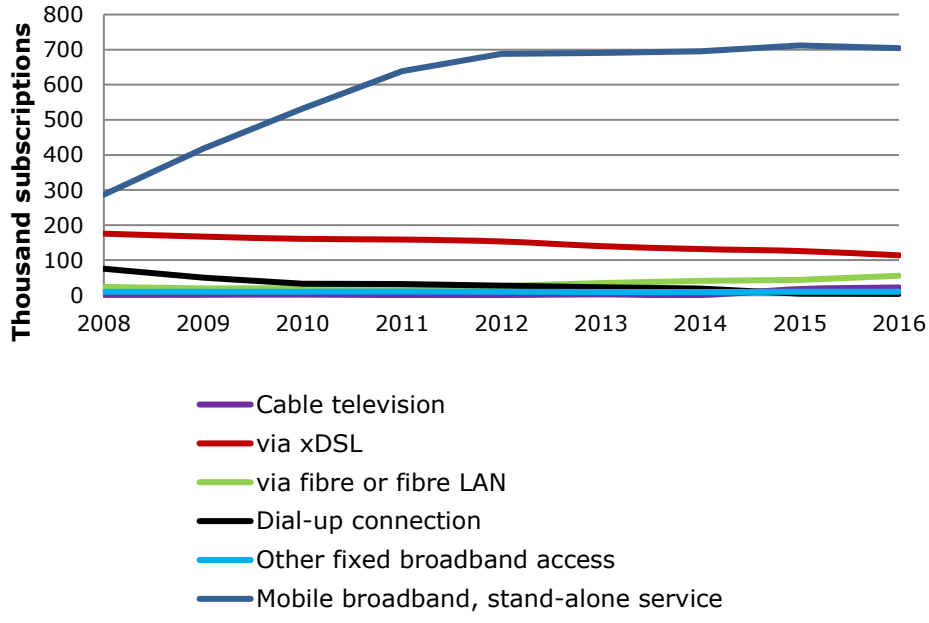


Figure 19 Development of subscriptions for broadband - corporate



The number of group connections on fixed broadband subscriptions

Group connections refers to active, private internet subscriptions with, for example, landlords, housing cooperatives, housing associations or village communities rather than directly with the end customer. Almost 628,000 broadband subscriptions were stated to be group connections, which is an increase of 38 per cent.

There were 530,000 group connection subscriptions via fibre and fibre LAN, of which almost 240,000 were bundled with other electronic communication services. There were 86,000 group connections via cable TV, of which 5,000 were bundled. Group connections with xDSL subscriptions amounted to 10,000 and these were all bundled.

Group connection subscriptions account for 27 per cent of the total number of private broadband subscriptions via fibre and fibre LAN, 13 per cent of private cable TV subscriptions and 2 per cent of xDSL subscriptions.

The three largest providers of group connections were Telenor (40 % of all group connections), Telia Company (25 %) and ComHem (16 %).

43 per cent of group connections were part of a package. Group connections often offer lower prices to end customers. Often with group connections everyone in the group must join and agreements normally have relatively long binding periods.

4.2 Transfer speed - Fixed broadband

In this report, this refers to the speed that the customer subscribes for. The actual speed experienced by the consumer may be lower, especially in the case of broadband services in mobile networks. Download speed means the speed according to the subscription at which the user's web browser can receive data and upload speed means the speed according to the subscription at which the user can send data.

Download speeds, fixed broadband

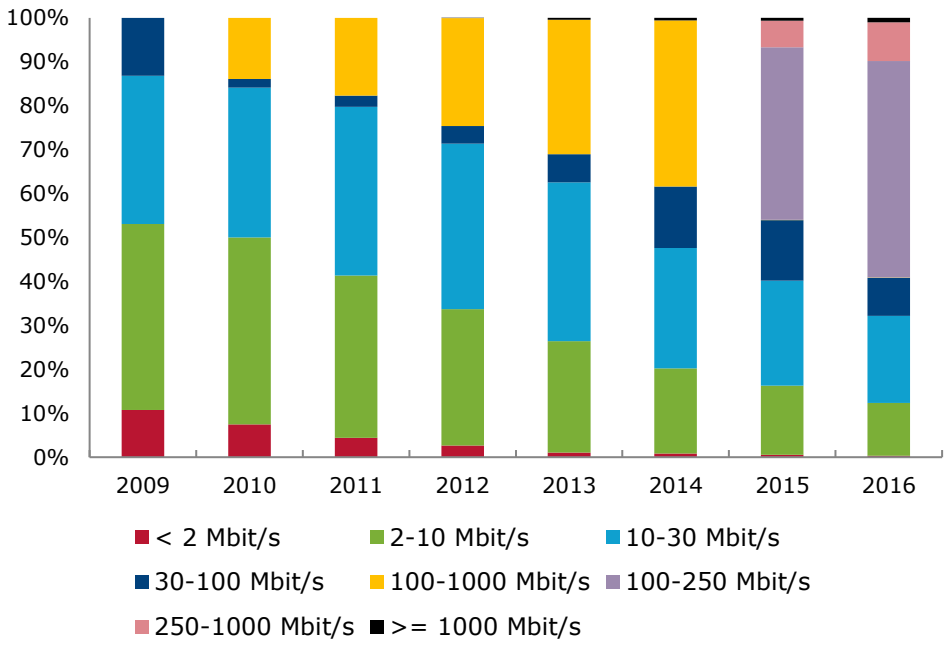
The number of subscriptions with high transfer speeds (100 Mbps or more) continues to increase, while those with lower speeds (under 30 Mbps) are falling.

There were 2.18 million subscriptions with speeds of 100 Mbps or more, which is an increase of 36 per cent. This represents 60 per cent of all fixed broadband subscriptions. Fibre subscriptions with a download speed of 100

Mbps or more amounted to 1.6 million (increase of 27 per cent), while subscriptions via cable TV networks with this speed amounted to 570,000 (increase of 68 per cent). The number of subscriptions with 1 Gbps amounted to 36 000, which was an increase of 65 per cent. There were 320,000 fixed broadband subscriptions with speeds between 30 and 100 Mbps, a reduction of 33 per cent.

79 per cent of fibre subscriptions had a speed of 100 Mbps or more, while 68 per centre of broadband subscriptions via cable TV ha speeds of 100 Mbps or more.

Figure 20 Distribution of speeds for download of data - fixed broadband



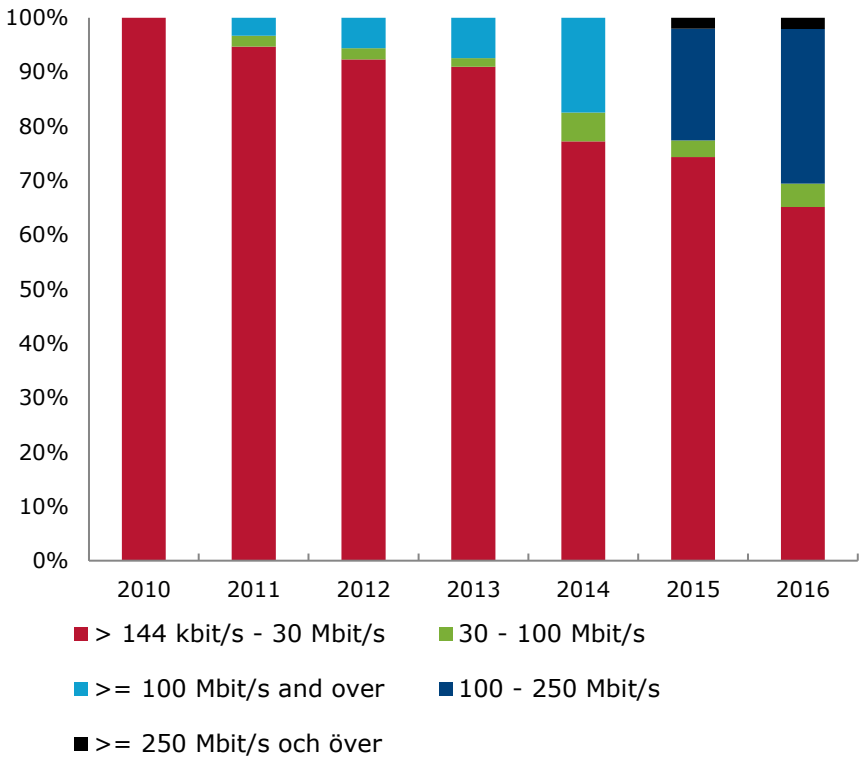
Upload speeds, fixed broadband

The number of fixed broadband subscriptions with upload speeds of 100 Mbps or more increased by 43 per cent to 1.12 million. Subscriptions for fixed broadband with upload speeds between 30 and 100 Mbps increased by 49 per cent to 160,000.

There were 2.39 million subscriptions with an upload speed of up to 30 Mbps, a reduction of 7 per cent. This range represents the largest proportion of all fixed broadband subscriptions.

More and more subscriptions are being marketed with symmetrical transfer speeds, up and down. This is partly a consequence of the proportion of fibre subscriptions increasing.

Figure 21 Distribution of speeds[6] for upload of data - fixed broadband

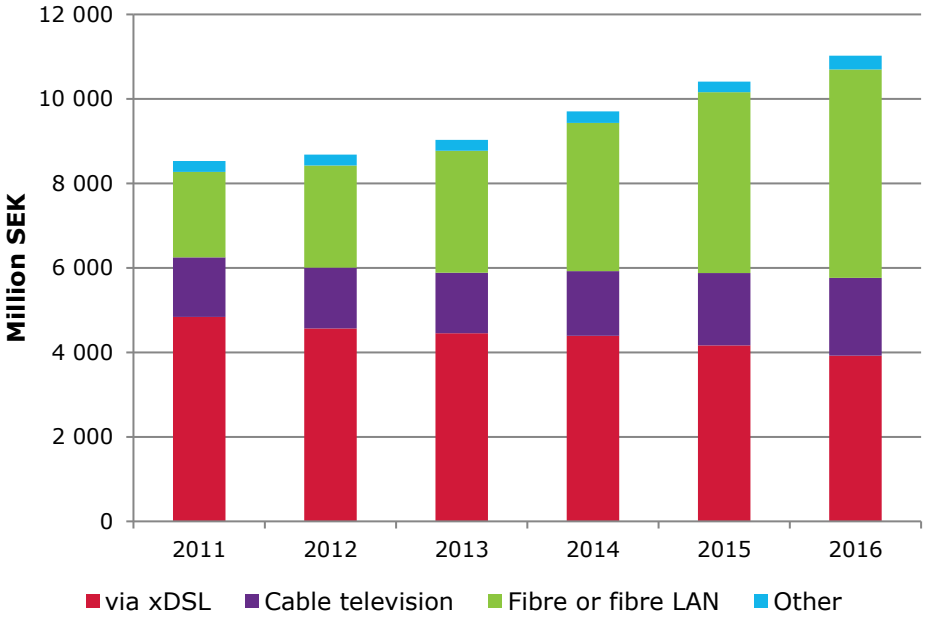


4.3 Income from internet services

The following section mainly reports income from fixed internet services. Income from mobile data networks is reported in section 3.6.

[6] The speed refers to what is being subscribed for and not the actual speed reading.

Figure 22 Income from the end customer market for fixed internet services



Income from fixed internet subscriptions amounted to SEK 11 billion in 2016, which is 6 per cent more than in 2015, when it was SEK 10.4 billion. Income from dial-up connections was negligible.

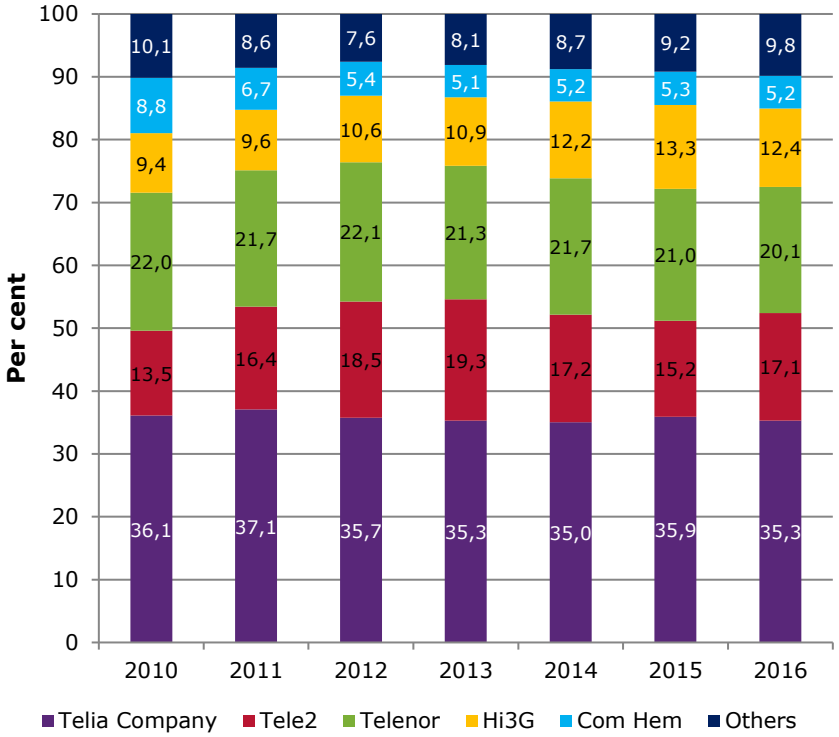
Of the income from fixed broadband in 2016, fibre subscriptions accounted for 45 per cent, xDSL subscriptions for 36 per cent and broadband subscriptions via cable TV for 17 per cent. Income from fibre subscriptions has increased by 15 per cent and income from cable TV subscriptions by 7 per cent compared with 2015. Over the same period, income from xDSL subscriptions fell by 6 per cent.

During 2016, the average income per month from a fixed broadband subscription was SEK 256, which is the same as in 2015.

4.4 Market share - Broadband in total

Market share for broadband is presented in total and also by fixed and mobile broadband subscriptions (see section 3).

Figure 23 Market share - subscriptions for broadband in total

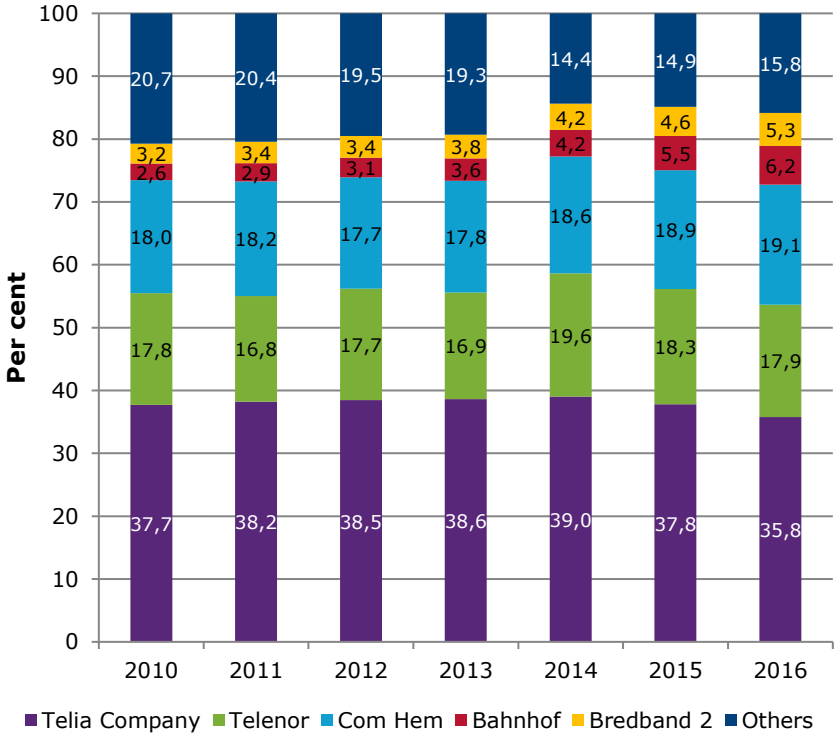


Between them, the five largest operators had 90 per cent of all broadband subscriptions at end December 2016. Tele2's market share increased from 15.2 to 17.1 per cent, while Hi3G's and Telenor's market share fell to 12.4 and 20.1 per cent respectively.

4.5 Market share - Fixed broadband

The three largest operators, Telia Company, Telenor and Com Hem accounted between them for 75.4 per cent of fixed broadband subscriptions at end December 2016.

Figure 24 Market share - fixed broadband subscriptions



Telia Company's market share fell by 2 percentage points to 35.8 per cent, while "others" increased by 1 percentage point to 15.8 per cent. Bahnhof and Bredband2 also increased their market share, to 6.2 and 5.3 per cent respectively. The largest in the group "others" was AllTele (private and corporate) with 3.1 per cent of subscriptions. Phonera, which belongs to ComHem, is included in "others" and has 1 per cent.

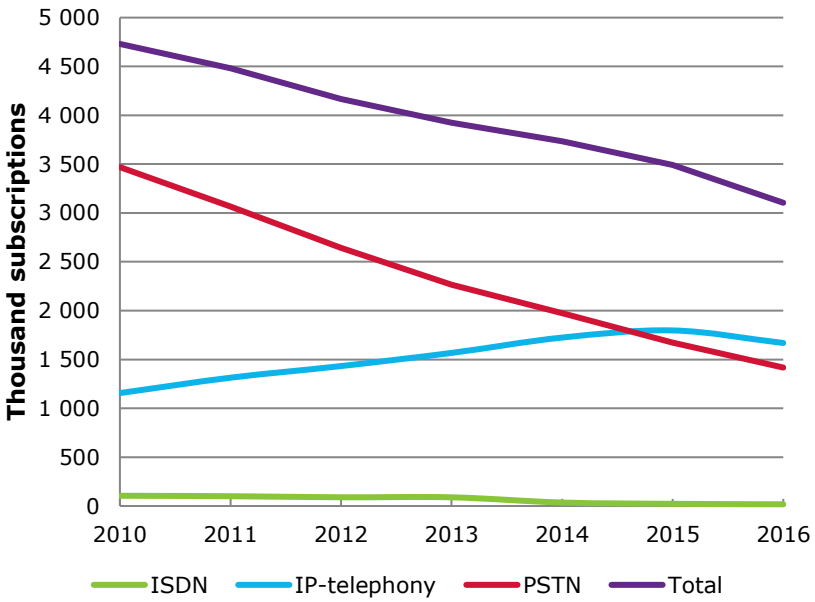
5 Fixed line telephone services

All figures below refer to the situation on 31 December 2016 and comparisons are made with the same date in 2015.

5.1 Subscriptions - Fixed line telephone services

At the end of December 2016, there were 3.10 million fixed line telephone subscriptions in Sweden, compared with 3.49 million the previous year. This is a reduction of 11 per cent in one year and is the largest annual fall during the period PTS has been collecting statistics on the market. Almost 2.28 million of the fixed line subscriptions were private. If this is related to the 4.54 million[7] households in Sweden, this means that around 50 per cent of households had a fixed line telephone subscription.

Figure 25 Number of subscriptions for fixed line telephony - private and corporate



Connections via PSTN

There were 1.42 subscriptions for fixed line telephony via PSTN, which is a reduction of 15 per cent. Of these, there were 353,000 with companies other

[7] According to SCB there were 4.33 million households in Sweden on 31 December 2015. For more information, see definitions

than Telia Company via the wholesale product GTA[8]. The number of subscriptions via GTA fell by 21 per cent. The greatest proportion of GTA subscriptions were with Phonera (36 per cent) and Tele2 (35 per cent).

The number of Carrier PreSelect subscriptions[9] fell by 19 per cent to 58,000.

Connections via ISDN

At the end of December 2016 there were 18,000 connections via ISDN, which is a reduction of 20 per cent. ISDN is now exclusively a corporate service and there may be up to 30 simultaneous users on the same connection. Telia Company had 42 per cent of all ISDN connections.

Active subscriptions with IP telephony

In addition to traditional telephony (PSTN, ISDN) operators also offer so-called IP telephony (also known as VoIP - Voice over IP) as a service. This is done by connection over the IP network that the operator itself has control over, unlike connection over the internet. IP telephony is accessed via fibre LAN, Cable TV network, xDSL and "other IP-based access" or "other access".

The number of IP telephony subscriptions[10] is now greater than the number of subscriptions via traditional telephony (PTSN and ISDN). IP telephony subscriptions amounted to 54 per cent of all fixed line telephony subscriptions. For the first time since IP telephony was introduced, the number of subscriptions fell - to 1.67 million.

The number of IP telephony subscriptions via fibre or fibre LAN was 670,000, which is an increase of 7 per cent. The number of subscriptions via "other IP-based access"[11] fell by 1 per cent to 195,000. The number of IP telephony subscriptions via xDSL was 509,000, which is a reduction of 21 per cent. The

[8] GTA is an abbreviation of *grossistprodukt för telefoniabonnemang*, which means wholesale product for telephony subscriptions. GTA means that a subscriber can pay both subscription fee and call charges to an operator other than Telia. Before GTA was introduced in 2004, many subscribers paid a subscription fee to Telia and a traffic invoice to another company (so-called Carrier PreSelect telephony)

[9] Refers to active Carrier PreSelect customers where the customer is indirectly connected. Active means that the customer has made at least one call in the last quarter of the review period. Note that if a customer has different Carrier PreSelects for national and international calls, this corresponds to only one customer. Carrier PreSelect can be abbreviated to CPS. Refers to Carrier PreSelect for both PSTN and ISDN.

[10] Some operators have not been able to give an exact figure for this question but have estimated the answer, so that the number is therefore an estimate to a certain extent.

[11] The operators state in comments what is referred to. Here are the descriptions of the three that correspond to about 60 per cent of these subscriptions: "VoI Over The Top and we cannot determine access form", " fixed connections Managed Voice" and " Internet, Internet Pro and IP-VPN"

number of IP telephony subscriptions via cable TV was 296,000, which is a reduction of 9 per cent.

Com Hem, Telia Company and Telenor (including Glocalnet and Bredbandsbolaget) are the three largest companies in IP telephony with 69 per cent of all subscriptions between them.

Inactive IP telephony subscriptions

The number of active subscriptions with IP telephony amounted to 1.67 million. Here active subscriptions refers to those that have generated traffic (incoming or outgoing calls) during the last 3 month period. The number of inactive IP telephone subscriptions amounted to 443,000. 95 percent of these subscriptions were with Telia Company and Telenor. Thus in total there were 2.12 million IP telephony subscriptions.[12]

Bundled IP telephony subscriptions

The number of IP telephony subscriptions that were part of a package amounted to 853,000, or about 40 per cent of all IP telephony subscriptions.

Number of subscriptions for fixed line telephone services, by private and corporate

The figures below show the number of subscriptions for fixed line telephone services, by private and corporate customers. One major difference between private and corporate is that IP telephony is more common in the private sector, while PSTN is still more common in the corporate sector.

[12] The division in to active and inactive IP telephony subscriptions has been estimated by some operators.

Figure 26 Number of subscriptions for fixed line telephony - private

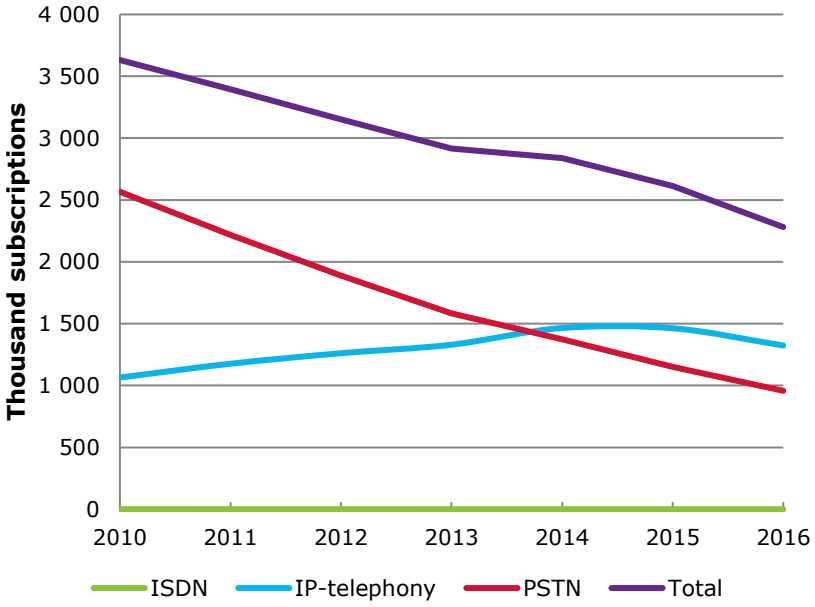
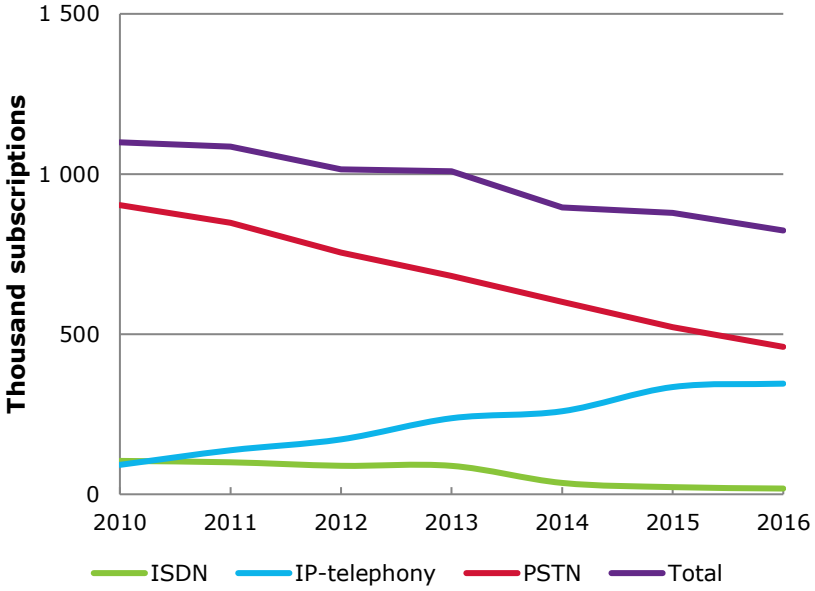


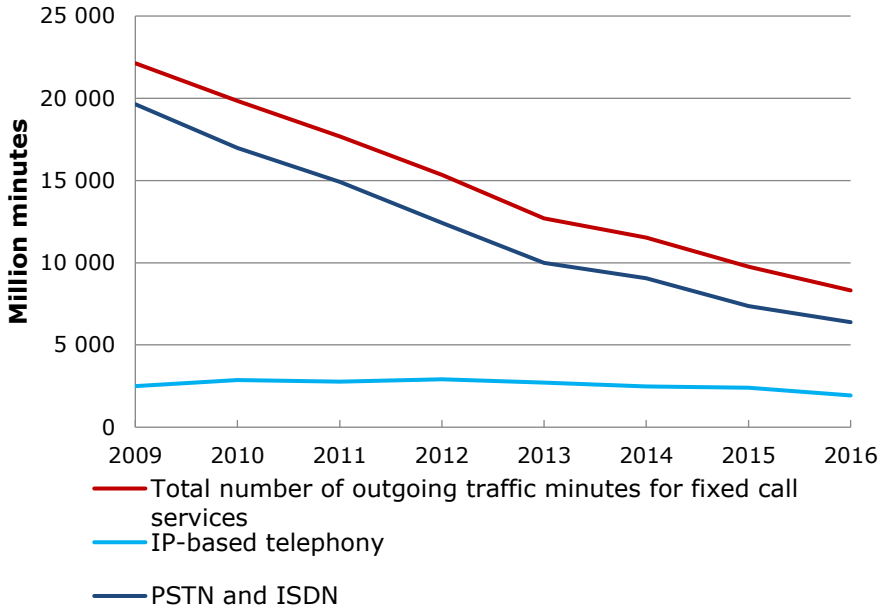
Figure 27 Number of subscriptions for fixed line telephony - corporate



5.2 Telephone traffic – Fixed line telephone services

The number of outgoing call minutes from fixed line subscriptions fell 14 per cent to 8.3 billion. Of these, the number of minutes from private subscriptions fell by 24 per cent to 3.1 billion.

Figure 28 Outgoing call minutes from fixed line telephone services



The number of outgoing call minutes from IP telephony subscriptions (private and corporate) fell 19 per cent to 1.9 billion. Some operators have estimated the number of call minutes from IP telephony and the total is therefore to some extent an estimate.

The numbers of calls from fixed network subscribers fell by 20 per cent to 4.8 billion.

The average length of call from private subscriptions was 3.4 minutes, a reduction from 3.5 minutes. The average number of calls per private fixed network subscription per month was 62, which is a reduction from 65.

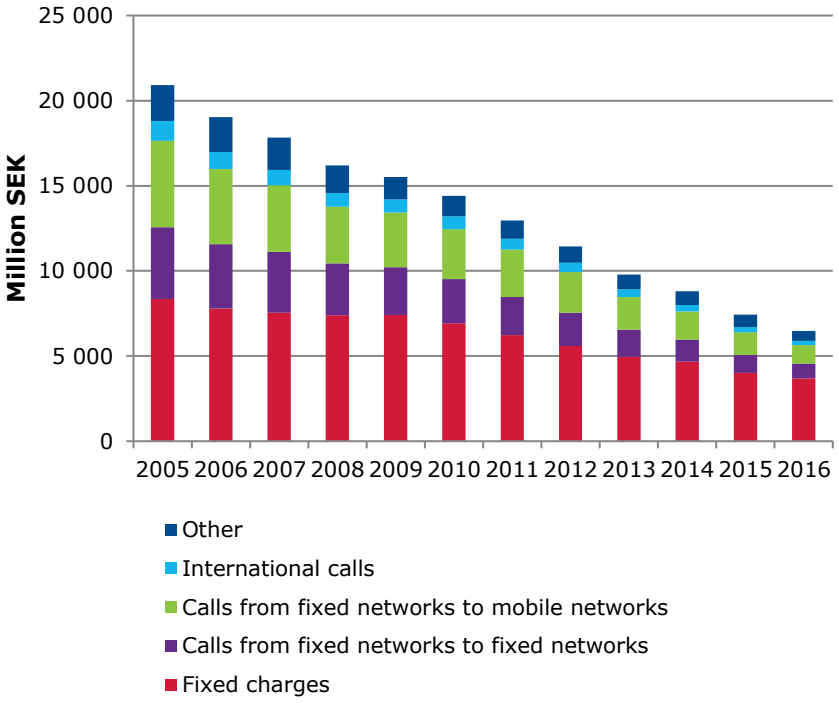
Call traffic differs between private and corporate. So-called SIP trunking is often used in the corporate sector. Companies usually use the physical internet connection that they are subscribing to for SIP trunking, which is the logical connection between the company's LAN and the operator's SIP server (also

called SIP proxy). Thus they do not have their own physical connection for SIP trunking.

5.3 Income from fixed line telephone services

Income from fixed line telephone services (excluding income from dial-up internet) fell from SEK 7.4 billion in 2015 to SEK 6.5 billion in 2016. This is a reduction of 13 per cent.

Figure 29 Income from end customers for fixed line telephone services



In 2016 fixed charges represented 57 per cent of income from fixed line telephony, which is 3 percentage points more than the previous year. Income from IP telephony amounted to SEK 1.3 billion in 2016, which is a reduction of 9 per cent from the previous year. IP telephony's share of the income increased from 19 per cent in 2015 to 21 per cent in 2016.

The average income per month from a fixed line telephone subscription was SEK 164 in 2016, a reduction of SEK 8 compared with 2015.

5.4 Income from interconnection in fixed networks

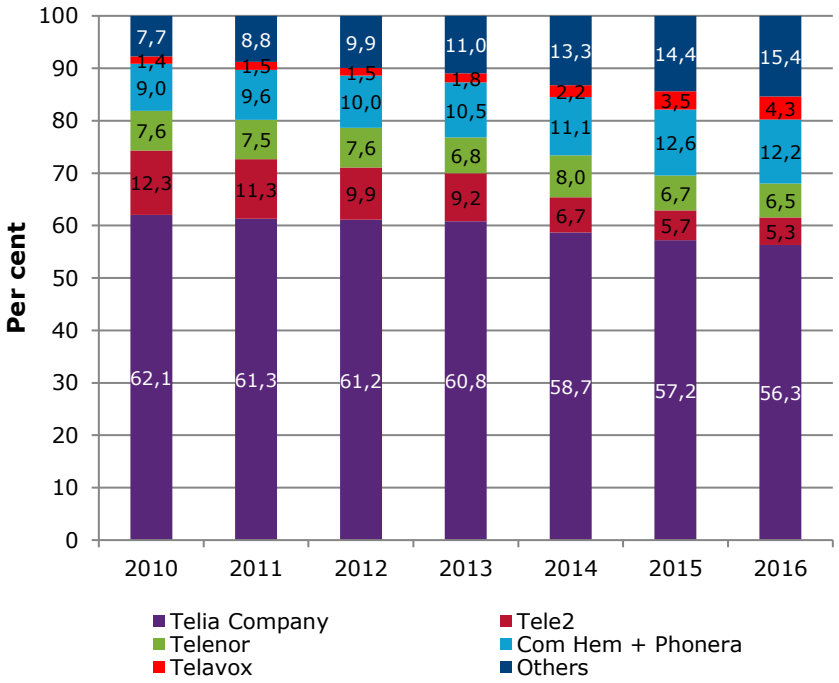
In 2016, 8.8 billion minutes were terminated in the fixed networks, a reduction of 5 per cent from 2015, when 9.4 billion minutes were terminated.

In 2015 interconnection income from fixed line telephony amounted to SEK 87 million, which is a reduction of SEK 12 million, or almost 12 per cent, compared with 2015.

5.5 Market share - Fixed line telephone services

Market share for fixed line telephone services includes all subscriptions for fixed line services except Carrier PreSelect and prefix subscriptions.

Figure 30 Market share - fixed line telephone service subscriptions



The four largest companies, Telia Company, Com Hem (including Phonera), Tele2 and Telenor, had a combined market share of 85 per cent. Telia Company's market share fell from 57.2 to 56.3 per cent. Telavox increased its share from 3.5 to 4.3 per cent. The market share of the "others" group increased by 1 percentage point to 15.4 per cent. AllTele was the biggest of the "others" with 4 per cent of subscriptions.

5.6 Number porting - Fixed line telephone services

This section is about porting instances for fixed (geographical) telephone numbers. See section 3.11 for more information about number porting and figures for the number of porting instances for fixed line telephone numbers and mobile numbers. The number of ported fixed line telephone numbers is not included in SNPAC's statistics. For this reason the number of porting instances is shown below, which is lower than the number of ported telephone numbers.

The number of porting instances for fixed (geographical) numbers amounted to 185,000 in Sweden, which was an increase of 4 per cent. This represents 6 per cent of the total number of fixed line telephone subscriptions.

6 TV services

This section is about developments in the number of subscriptions for traditional cable TV which follows a fixed platform. Section 6.1 gives statistics for pay TV subscriptions, section 6.2 reports surveys about free TV via the digital terrestrial network and section 6.3 briefly reports on other ways of seeing moving images and viewing times for traditional TV.

6.1 Traditional pay TV services

6.1.1 Traditional pay TV subscriptions -

Traditional TV is distributed to consumers via various distribution platforms such as cable, satellite, terrestrial transmission or broadband. TV via broadband is delivered via fibre, fibre LAN or xDSL.

In December 2016, there were 5.3 million pay TV subscriptions in Sweden, which was in increase of 2 per cent. The number of pay TV subscriptions is more than the number of households in Sweden since households may have one or more subscriptions, often an analogue subscription (cable TV) via the property owner and a digital subscription taken out by the consumer. There are now only analogue TV subscriptions via cable TV networks. These amounted to 2.4 million, which corresponds to an increase of 2 per cent. Digital pay TV subscriptions via cable TV networks, satellite, terrestrial transmissions or broadband amounted to 2.9 million, which corresponds to an increase of 1 per cent. Figure 31 below shows developments in the number of pay TV subscriptions.

Figure 31 Number of pay TV subscriptions by distribution platform

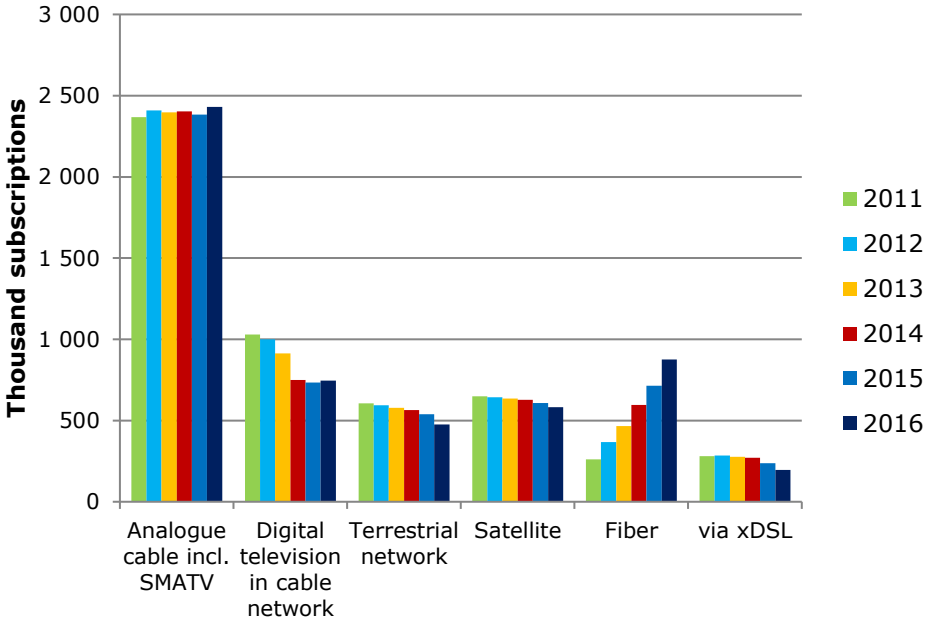
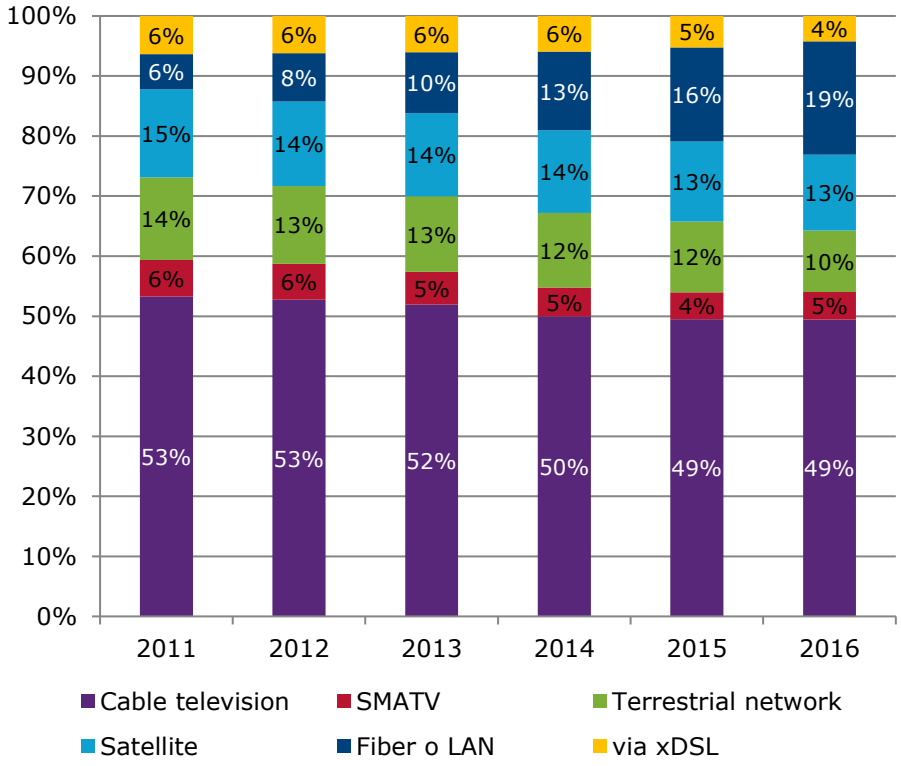


Figure 32 below shows developments in the proportion of TV subscriptions by distribution platform. Here household subscriptions are counted in the same platform only once so as to show trends in the distribution platforms. In order to calculate the size of cable TV platforms, PTS uses calculation method that avoids duplication of subscriptions.

Figure 32 Proportion of TV subscriptions by distribution platform



TV subscriptions via broadband (IPTV) continue to increase

TV via broadband, known as IPTV, consists of TV distribution via either fibre or xDSL. The expansion of broadband also affects how we receive traditional TV. The distribution platform that is growing is IPTV, which can mainly be explained by the continued development of broadband through fibre networks.

The number of subscriptions for IPTV continued to increase in 2016 and amounted to 1.0 million, which is an increase of 12 per cent. The number of subscriptions for IPTV via fibre increased by 23 per cent to 875,000, and fibre is thus the largest digital distribution platform. The number of subscriptions for YV via xDSL fell by 18 per cent and amounted to 195,000 million.

Subscriptions for digital cable TV on a par with last year

Digital cable TV: The number of digital cable TV subscriptions amounted to 745,000. Over the last three years, digital cable TV subscriptions have been at the same level, but before this cable TV subscriptions decreased from 2012. There was a movement between 2013 and 2015 when subscriptions fell sharply, which derives from Telenor's acquisition of Tele2's customer base for cable TV subscriptions. [13]

Analogue cable TV including SMATV: The total number of analogue cable TV subscriptions including SMATV[14] has been relatively unchanged at 2.4 million since 2006. The reason is that many households have an analogue TV subscription included as part of the rent. The analogue TV subscriptions were all taken out indirectly via agreements with property owners, a distribution that has been unchanged since measurements began in 2009.

Some of the total of analogue cable TV subscriptions are via big TV operators such as Com Hem, Canal Digital Kabel, Sappa, Telia Company and Telenor. Subscriptions of this type amounted to 2.2 million, which is the same as the previous year. The remaining 211,000 subscriptions have been estimated on the basis of the number of households that have subscriptions via SMATV networks. Subscription via SMATV networks increased by 2 per cent compared with the previous year. The volume of SMATV and the increase must be viewed with caution however, since these are estimates.

Most households that have a digital cable TV subscription also have an analogue cable TV subscription via the property owner. Of the above mentioned 2.2 million subscribers who had analogue cable TV subscriptions, 674,000 had a digital cable TV subscription in addition to the analogue one via the property owner. Other households with analogue cable TV subscriptions can often watch free TV channels digitally at no extra cost.[15]

PTS calculates that the number of households with cable TV services (one or more subscriptions) was approximately 3.2 million, which is 2 per cent more than the previous year.

---

[13] Telenor: Telenor bought Tele2's Swedish fibre and cable TV operation on the private customer market on 23/10/2013

[14] Satellite Master Antenna Television (SMATV) is an independent cable TV network where many households share an antenna.

[15] According to Com Hem:"Since January 2010, all Com Hem-connected households can receive a number of free digital channels at no extra subscription cost. All that is needed to see the free digital channels is an approved digital box or a TV with built in digital box that is approved by Com Hem. No programme card is needed."

Subscriptions for TV via satellite continue to fall

The number of subscriptions for TV via satellite continues to fall and amounted to just under 583,000 on 31 December 2016. This is a reduction of 4 per cent in one year.

Biggest annual reduction in subscriptions in terrestrial TV (pay TV)

In terrestrial broadcasting there is the possibility of having a pay TV subscription and it is also possible to watch free TV[16] without a subscription, digital terrestrial tv free to air (DTT FTA). DTT FTA is covered in section 6.2.

There is only one company that offers pay TV subscriptions on the terrestrial network and that is Boxer TV. The reduction in the number of subscriptions in the terrestrial digital network continues. There were 475,000 subscriptions for pay TV in the terrestrial digital network on 31 December 2016. This is a reduction of 12 per cent, which is the greatest annual reduction of subscriptions in the terrestrial digital network. The number of subscriptions in the terrestrial digital network has fallen every year since 2008.

6.1.2 Income from TV services

The following section reports income from pay TV services for basic and supplementary subscriptions.[17] All income that relates to the end customers' purchases of basic or supplementary packages is[18] included.

The total income from TV services for basic and supplementary subscriptions amounted to SEK 9.8 billion at the end of December 2016, which is an increase of 1 per cent from 2015.[19]

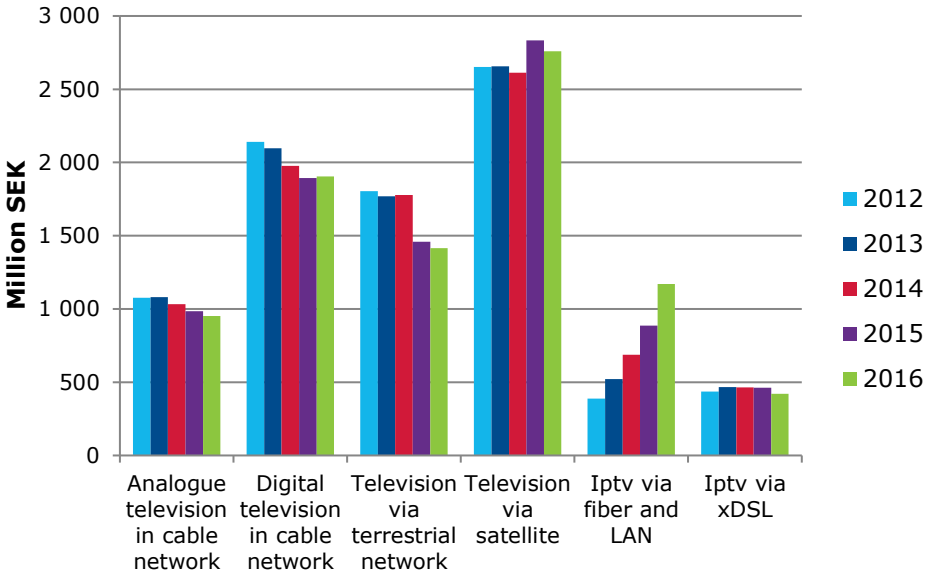
---

[16] Here free TV refers to TV that can be received unencrypted and free of charge by the end customer, with no requirement for a subscription or equivalent. Free TV is only available on the terrestrial platform, where the programme company buys the transmission service directly from Teracom, which transmits the channels unencrypted. Since free TV viewers do not have a subscription to watch the programmes, it is not clear exactly how many households only receive free TV and have no pay TV subscription.

[17] In previous years, income from "smaller cable TV networks and property owners" who reported was included in income for analogue and digital cable TV subscriptions.. This income has not been included with effect from the 2012 report.

[18] Supplementary subscriptions refers to subscriptions where a household has a separate agreement for additional services such as digital TV with channel package. This includes all income that relates to the end customer's purchase of supplementary subscriptions (channels or packages in addition to the basic subscription): ongoing charges, start-up charges, hire or sale of digital TV boxes and programme cards. Supplementary packages also included income for transaction-based VOD (video on demand) and pay-per-view up to and including 2015. From 2016 income for transaction-based VOD (video on demand) and pay-per-view is not included.

Figure 33 Income from TV services in basic subscriptions



Income from the basic package

Income from basic subscriptions[20] amounted to SEK 8.6 billion, an increase of 1 per cent. Income from basic subscriptions has been at the same level since 2012.

The greatest increase was income from basic packages for TV via fibre, which increased by 32 per cent to SEK 1.2 billion. Income from basic packages for TV via xDSL fell by 9 per cent to SEK 400 million. Income from basic packages for digital cable TV amounted to SEK 1.9 billion, which is an increase of 1 per cent compared with the previous year. Income of SEK 1.0 billion came from analogue cable TV subscriptions, which is a fall of 3 per cent. Income from basic packages for terrestrial TV fell by 3 per cent to SEK 1.4 billion. Income from basic packages for TV services via satellite fell by 3 per cent compared with the previous year, to SEK 2.8 billion.

[20] For the period 2009 to 2014, income from terrestrial TV services for both basic and supplementary packages was reported as a basic package, since they could not be separated. This means that for these years income from basic packages was somewhat too high, while income from supplementary packages was somewhat too low.

Income from supplementary packages

The reported income from supplementary packages[21] was at the same level as the previous year and amounted to SEK 1.2 billion. For 2016, income from supplementary subscriptions does *not* include transaction-based VOD[22] (video-on-demand) and pay-per-view[23], which it did in 2015. For this reason income from supplementary subscriptions in 2016 and in previous years is not entirely comparable. VOD and PPV has been removed because this income does not include income from all companies that offer VOD services in the market, but only those who respond to The Swedish Telecommunications Market.

The total average income generated per household per month for TV services in 2016 was SEK 181, which is the same as the previous year.

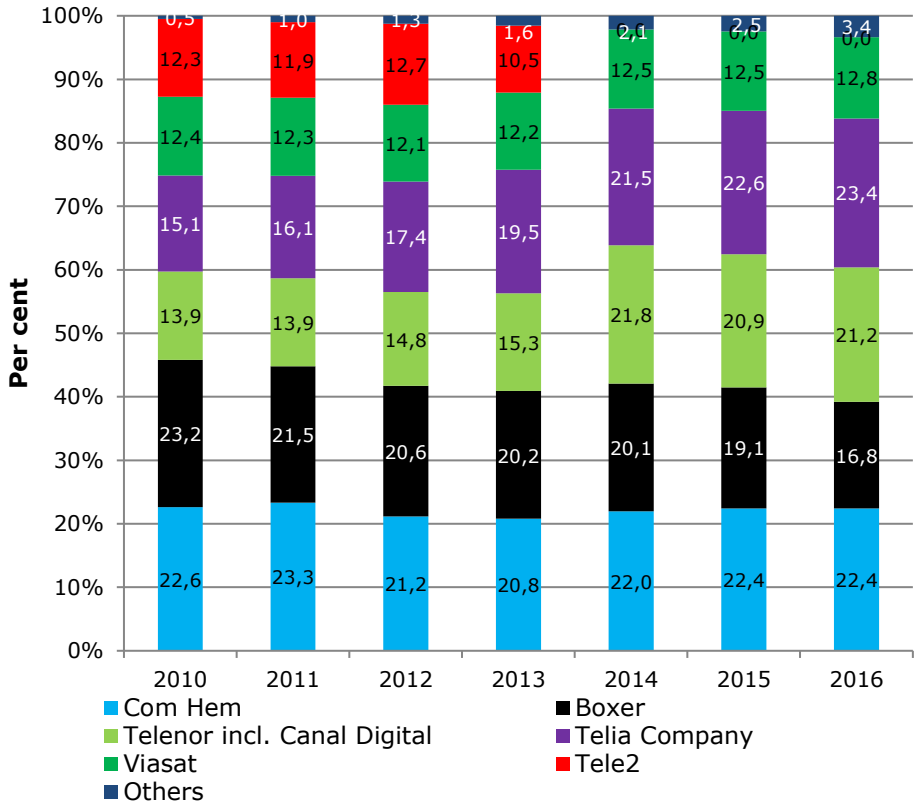
6.1.3 Market share - pay TV services

Digital pay TV services

The shares for digital TV services are based on the number of pay TV subscriptions by digital distribution methods. The five biggest companies, Com Hem, Telenor, Telia Company, Boxer[24] and Viasat accounted between them for 96.6 per cent of subscription volume on 31 December 2016, which is at the same level as the previous year.

[21] For the period 2009 to 2014, income from terrestrial TV services for both basic and supplementary packages was reported as a basic package, since they could not be separated. This means that for these years income from basic packages was somewhat too high, while income from supplementary packages was somewhat too low.
[22] VOD means distributing films and TV programmes to viewers via some form of network exactly when the viewer wishes to watch them.
[23] Pay-per-view means paying to be able to watch a single film or TV programme for a limited period, as distinct from a subscription.
[24] Com Hem acquired Boxer in June 2016 and Boxer will be consolidated into Com Hem's accounts with effect from 30 September 2016. Boxer is reported separately here.

Figure 34 Market share - subscriptions to digital TV services



The biggest change in market share is that Boxer fell about 2 percentage points to 16.8 per cent. Telia Company increased its share by about 1 percentage point to 23.4 per cent. The group "others"[25] mainly consists of a number of suppliers of IPTV and their combined share also increased by about 1 percentage point to 3.4 per cent. The biggest company in "others" is Sappa with 2.0 per cent.

It is Com Hem including Boxer that is the leader with a combined 39.2 per cent.

6.2 Digital terrestrial TV free to air (DTT FTA)

The households that only receive DTT FTA are not included in the statistics. Since DTT FTA viewers do not have a subscription to watch the programmes,

[25] "Others" includes Sappa and small IPTV operators. Since 2012, subscriptions from "small cable TV networks and property owners" have no longer been included in "others" since they are also included in "SMATV operators".

it is not clear exactly how many households receive DTT FTA. According to a survey by Sweco for PTS[26] 8 per cent of households have DTT FTA as the only means of reception in their permanent residence, which corresponds to about 354,000 households (based on number of households according to SCB). This is a reduction compared with 2015.[27]

DTT FTA is most common among those who live in detached houses. Among these households, 13 per cent only have DTT FTA, followed by those who rent, about 6 per cent of whom say they only have DTT FTA. DTT FTA is least common in housing cooperatives.

Nine out of ten households that have DTT FTA think that they will still receive TV the same way in 12 months time, which is a slight increase over 2015. The proportion planning to change is 5 per cent.

Of those who responded, about one in four has access to a holiday home. Of these, one household in three has only DTT FTA in the holiday home, which is a reduction compared with 2015.

About one household in three chooses to pay for other TV services, such as Netflix, HBO, Viaplay, which is a slight increase over 2015. For those with only free DTT FTA the figure is lower, 22 per cent.

6.3 TV viewer figures and other ways of looking at moving images

Viewer figures for traditional TV in December 2016 were at the same level as a year previously, according to the monitoring company MMS. The figure for December 2016 for those who have watched TV for 5 continuous minutes or more on an average day was 61 per cent, which was unchanged from the previous year. The number of minutes of TV viewing on an average day was also as good as unchanged at 133 minutes (compared with 136 the year before). Seen over a longer period, time spent watching traditional TV has fallen greatly as more and more people are using streaming services. A survey by MMS showed that almost half, 47 per cent, of 9 to 99 year olds have access to a subscription service for streamed TV or film in their homes, which is an increase of 380,000 people compared with the previous year. A third have Netflix, which is still the largest supplier in Sweden.

[26] Sweco was commissioned by PTS to perform a survey of households' use of free TV in 2016, which has been published by PTS http://www.pts.se/sv/Dokument/Rapporter/Radio/2017/Hushallens-anvandning-av-fri-tv-2016/ . Previous surveys for 2013, 2014, 2015 were performed by SWECO and even earlier surveys for 2011 and 2012 were performed by TNS SIFO.
[27] Based on number of households according to SCB

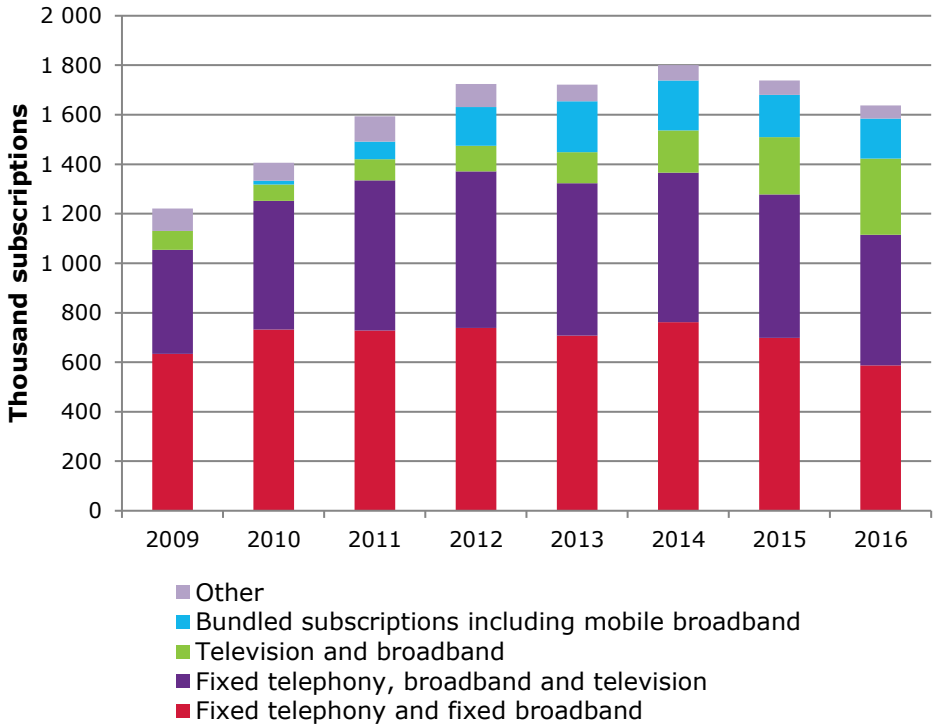
7 Bundled services

Here bundling refers to subscriptions that contain several services that are offered and marketed in the same offer or with a common price list. The most common offers on the market include various combinations of telephony, TV and fixed broadband. Bundled offers with services such as Skype, Netflix etc. are not included.

The number of bundled subscriptions at the end of December 2016 was 1.64 million, which is 6 per cent lower than at the same time the previous year. Overall, we can say that packaging of broadband and TV is increasing while all other packages are decreasing.

Telia Company had the most bundled subscriptions, followed by Com Hem and Telenor. Between them, these three operators had 86 per cent of the package subscription market. Fixed broadband was included in about 1.15 million bundled subscriptions, which was 37 per cent of all fixed broadband subscriptions.

Figure 35 Number of bundled subscriptions



Double play, bundled subscriptions with two services, decreased by 4 per cent to 1.08 million. The commonest bundled subscription consist of fixed telephony and broadband, and these fell by 16 per cent to 587,000 subscriptions. This combination accounted for 36 per cent of the total number of bundled subscriptions. Bundled subscriptions consisting of TV and fixed broadband are the third commonest and these increased by 33 per cent to 307,000 subscriptions.

Triple play, i.e. bundles of three services, declined by 9 per cent. The second most common bundle was subscriptions for fixed telephony, fixed broadband and TV. These bundled subscriptions amounted to 528,000 subscriptions, which was a reduction of 9 per cent.

Bundling with four services, so-called *quadruple play*, are relatively uncommon and were at the same level as the previous year at 14,000.

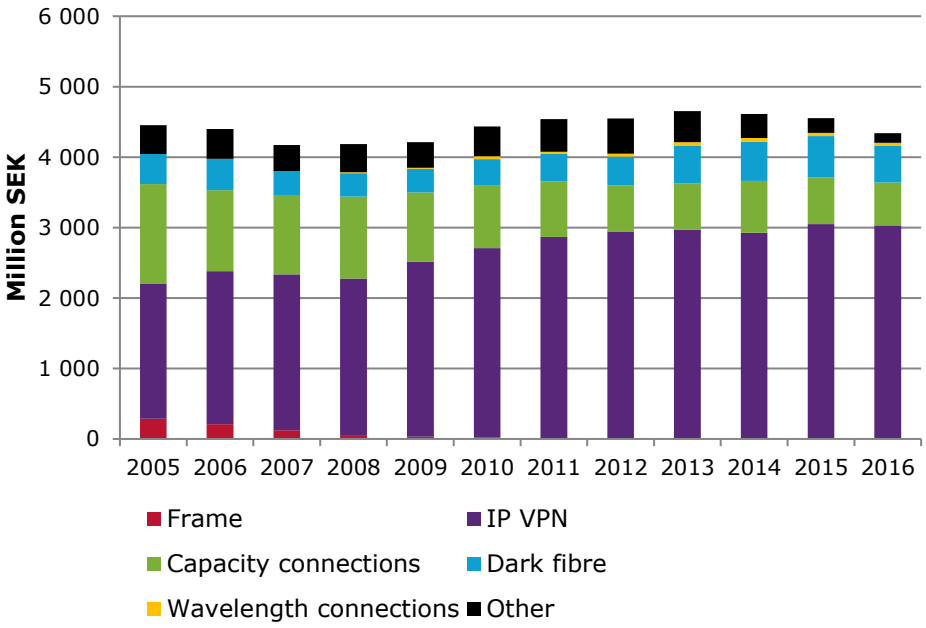
8 Data communication services and dark fibre to end customers

8.1 Data communication to end customers[28]

Data communication services refers here to services for companies (and other organisations) that are used to connect working locations and various IP based systems with each other. The number of connections and ports for data communication to end customers in December 2016 amounted to about 195,000 (2015: 190,000). 97,000 of these were used for IP-VPN[29], i.e. networks for internal company communication.

8.2 Income from data communication services and dark fibre to end customers

Figure 36 Income from data communication services and dark fibre to end customers



[28] A data communication service refers to a connection that is used by companies that can for example connect offices or different IP based systems with each other.
[29] IP-VPN refers to the following standards: IP Sec VPN, IP MPLS VPN, IP SSL VPN.

The total income from data communication services and dark fibre to end customers in 2016 was SEK 4.3 billion, a reduction of 5 per cent compared with 2015. There are considerable sales of dark fibre[30] as capacity services and wavelength connections to operators (wholesalers) but this income is not included in this report.

Between 2015 and 2016 income from IP VPN services[31] was largely unchanged at about SEK 3 billion, while income from capacity services[32] fell by 6 per cent to SEK 611 million. Sales of capacity services to end customers have shown a downward trend, while the trend for sales of IP VPN services has been upward. This is mainly because companies are increasingly outsourcing the operation of their IP networks to an operator instead of handling this themselves.

Income from wavelength connections to end customers was SEK 44 million, a reduction from SEK 46 million the previous year. End customer income from dark fibre fell by 12 per cent, from SEK 588 million in 2015 to Sek 519 million in 2016.

[30] Dark fibre connections refers to leased optical fibre connections where the fibre is not lit. That is to say, physical fibre cable without electronic equipment.
[31] IP-VPN refers to the following standards: IP Sec VPN, IP MPLS VPN, IP SSL VPN.
[32] The definition of digital capacity services changed in 2014 which means that statistics for the preceding years are not entirely comparable with those after 2014.

9 Ducting

This year's information gathering for The Swedish Telecommunications Market included for the second year questions about the ownership and use of ducting. PTS collects responses because of the ducting obligation in SMP decisions for market 3a (the market for local access to network infrastructure). The information is also being collected because of the new act (2016:534) on measures for the development of broadband networks, which was implemented into Swedish law on 1 July 2016.

Of the 231 organisations that received questions about ducting, 165 stated that they owned their own ducting as at 31 December 2016. Of the 165 respondents, 24 stated that they hired out ducting during 2016 and a further 90 stated that they have the possibility of hiring out ducting but had not been asked for this. Of the 165 respondents, 27 stated that they hired some form of ducting from others.

Appendix

1. Method and definitions

1.1 Data Collection and Implementation

The data collection that forms the basis of this report is covered by an obligation to reply, and has been since 2003.

The telecommunications companies that completed the questionnaire indicated the areas in which they conducted operations over the course of 2016. The number of companies that had operated within the different areas is shown in the table below. Note that a telecommunications company can operate in several areas.

Number of companies and other actors answered to the questionnaire	2016
Fixed call services	135
Interconnection in fixed networks	44
Mobile call and data services	70
Interconnection in mobile networks	29
Internet subscriptions	186
Television services	22
Bundled subscriptions	31
Data communications services - wholesale	192
Data communications services – end-user	190
Broadband access - to operators and end-users	153
Total number consulted	**522**

For a complete list of the operators that responded, see the attached list of participants in Appendix 1.

1.2 Discrepancies and updates of data

Measurement errors arise for various reasons during the data collection process, which may be due to a number of error sources:

- Those consulted did not answer all of the questions in the survey
- Not all operators in the market responded to the survey
- The responses were misleading due to the fact that it was not possible to produce an exact value based on the company's accounts, the instructions were misunderstood or inadequate, or incorrect information was submitted

The measurement errors are judged not to be large and can often be compensated for by starting from previously collected data or by estimating based on related questions in the survey.

As the information reported in percentages has been rounded off, the sum of the parts is not always 100 per cent.

The historical statistics are revised as PTS obtains corrections and further information. For that reason, the statistics for one and the same year can differ between editions of the report. The latest updated database is available on the PTS online statistics portal (www.statistik.pts.se)

For a more detailed description of measurement errors and non-response, see the attached quality declaration, Appendix 3.

1.3 Historical information and market shares

The development of the market is reported using statistics that, in some cases, go as far back as 1992. Since 2006, PTS has also published data on market shares for variables at the end-user level for every collection period. Market shares for a number of different variables are included in the report, but significantly more information is published on the online statistics portal. The variables judged to be inadequate, or which are misleading in another way, are not published on the statistics portal.

1.4 Definitions

Definitions that form the basis for this report are also used in the questionnaire, and these definitions are continually revised so that they are in sync with market developments. The segmentation of the individual sub-markets can change from year to year. Since 2003, PTS has also considered the information requirements for conducting market analyses and for deciding whether any operator has significant market power. Despite these changes, it is, for the most part, still possible to compare the information with that of previous reports.

Types of internet connection

With regard to internet services, it is common to mix up expressions such as fixed connection, broadband connection, wireless connection, mobile connection, broadband etc. as there are no standardised accepted definitions. In this report, the terms are defined according to the list below.

Dial-up connection	PSTN, ISDN
Broadband connection	Internet connection with high speed. Includes fixed broadband (connection via fixed radio, satellite, xDSL, cable television, fibre, fibre LAN) and mobile broadband.
Mobile broadband	Internet connection with high speed using the mobile networks. Includes (LTE, HSPA, CDMA 2000 and UMTS)
Dedicated mobile broadband as a stand-alone service	 Subscriptions primarily used for mobile data, and where data access was used at least once during the latest quarter of the period, or where subscription fees were paid during the latest quarter of the period. The subscription must not have generated any voice traffic minutes during the latest quarter of the period. The connection can be via a USB modem (dongle) or a router.
Standard mobile broadband subscription incl. 1Gbyte data per month or more	 Refers to products where the subscriber purchases at least 1 GB of data traffic per month, either as an add-on service or included in the subscription. In practice, this means smart phones.
Mobile calls and data services	Mobile subscriptions with or without call services and with or without data services

Machine-to-machine (M2M)

Machine-to-machine, or the Internet of Things, are terms for machines that communicate with machines without too much interference from humans. This report only concerns M2M that uses mobile phone numbers. This means that it is only a subset of all M2M, for example, not including M2M with fixed-line phone numbers or without numbers.

The terms private customer and business/corporate customer

In a number of cases, the statistics reported are divided between private and business customers, respectively. The definitions of private and business customers are based on who pays for the services, not who the user is. The

criterion for the party paying being designated a business customer (including organisations that are not businesses) is that it has an organisation registration number. The remainder are designated as private customers. This means, however, that businesses and organisations registered under a personal identity number are included in the private customer category.

Households

From 2016 onwards, Statistics Sweden (*Statistiska Centralbyrån*; SCB) has changed the method it uses to gather statistics on households. SCB has also revised statistics for household for the years 2011 – 2015 with the same method. This means that statistics related to the number of households in this report are not completely comparable to the corresponding statistics from editions before 2011. The number of households is published once a year and the latest published number is used in this report.

2 List of participants

0700 Sverige AB
21st Century Mobile AB (publ)
31173 Services AB
4 Sweden AB
42 Telecom AB
AB Borlänge Energi
AB Hallstahem
AB iP.1 internet till företag
AB PiteEnergi
AB Sappa
AB STOKAB
AB strömstaNET
Accesit Norden AB
ACN Communications Sweden AB
AC-net Externservice AB
Add Logo Telecom AB
Advoco Communication AB
AEB Kommunikation AB
Affärsverken Karlskrona AB
AID Solutions Väst AB
Alingsås Energi Nät AB
AllTele Företag Sverige AB
AllTele Privat AB
Alvondo AB
Ansluten Hosting i Sverige AB
Arboga kommun /Fibra
Arjeplogs kommun
Arkaden Konsult AB
ARKAIDN AB
Arvidsjaurstadsnät
Arvika Kommunnät AB
AT&T Global Network Services Sweden
Aurora Innovation AB
Avesta Kommun
Aviolinx Communication and Services AB
Avoice AB
AxByte AB
Bahnhof AB
Balder Tech AB
Bearcom
Beepsend AB
Benemen Oy
Bengtsfors Energi Nät AB
Best 4 you AB
BICS Sweden AG
Bild AT se AB
Bjurholms kommun
Bjäre Kraft Bredband AB
Bjärke Energi AB
Björnekulla IT AB
BKE TeleCom
BKO, Kommunikationsoperatör i Boden AB
BM Sverige AB
Bodens Energi Nät AB
BogalNet AB
Bollnäs Energi AB
Borderlight AB
BoreNet AB
Borås Elnät AB
Botkyrka Stadsnät AB
Boxer TV-Access AB
Bredband i Kristianstad AB
Bredband Östra Skaraborg AB
Bredband2
Bredbandsson AB
Bredbandsteknik 2000 i Karlshamn AB
Bredbandstjänster i Dalarna AB
Breiband.no AS
BroNet i Lysekil ekonomisk förening
BT Nordics Sweden AB
Bygdanet Ekonomisk Förening
Bålsta Kabel-TV AB
C4 Elnät AB

Canal Digital Sverige AB
Canal Vision AB
Carlslids Bredband ek. för.
CCD Communications Deutschland GMBH
Cellip AB
CenturyLink Europe BV filial Sweden
Challenger Mobile AB
Citynätet i Nässjö AB
Cloud 9 Mobile Communications Ltd
Clue AB
CLX Networks AB
Colt Technology Services AB
Com Hem AB
Com4 Sweden AB
Comgate Connect AB
Compatel Limited
Conect
Connectel AB
CRM Portalen AB
CRW Data AB
C-Sam AB
Cubic Telecom LT
Dackebygdens Kabel-TV AB
Daimler AG
Dala Energi Fibernät AB
Daladatorer i Mora AB
Data Communication & Software i Gröndal
Degerfors Energi AB
DGC Access AB
Dialoga Servicios Interactivos. S.A.
DIDWW Ireland Limited
DNA Oyj
Dorotea kommun
easy pbx AB
EasyTelecom i Stockholm AB
e-BO Enterprises NV
Eddima Teknik AB
Efftel AB
Egonet AB
Eidsiva bredbånd AS
Eksjö Energi ELIT AB
Ellevio AB
ElmNet AB
Ember AB
Emmaboda Energi & Miljö AB
engboms network solution ab
Eniro 118 118 AB
Enterprise Services Sverige AB
EPM Data AB
Erate AB
Eskilstuna Energi & Miljö
euNetworks Fiber UK Limited
European Ip Cloud AB
EVRY One Nät Uppsala AB
Excanto AB
Excedo Networks AB
Excellent Hosting Sweden AB
Falbygdens Bredband AB
Falbygdens Energi AB
Falu elnät AB
Fast Communications AB
Fastbit AB
Fello
Fiber Direkt i Sverige AB
Fiberaccessbolaget i Sverige AB
Fiberstaden AB
Finspångs Stadsnät Finet AB
First New Media Scandinavia AB
Flens Kommun
Fogwise AB
Fonia AB
Forshaga Fibernät AB
Fouredge AB
Framtidens Bredband
Freespee
Frilansjobb i Skandinavien AB
Fröskogs Fiber Ekonomisk Förening
ftech AB
GCM AB

Generic Mobile Systems Sweden AB
GleSYS Internet Services AB
Globetouch AB
Gothia Telecom Ab
Gotlands Energi AB
Griffel AB
Griffnet AB
Grästorp Energi ek för
GT3C Sweden AB
GTelecom Limited (B.V.I.) filial
GTT Comunication S.r.l.
Gällivare kommun
Gästabudstaden AB
Gävle Energi AB
Götalandsnätet AB
Göteborg Energi GothNet AB
Götene kommun
Habo Energi AB
Hagfors kommun
Halmstads stadsnät AB
Hammarö kommun / Stadsnät
Haparanda kommun
HebyNet AB
Hedemora Energi AB
Helsinge Net Ovanåker AB
Herrljunga Elektriska AB
Hewlett Packard Enterprise
Hi3G Access AB
Hjo Energi AB
Hofors kommun
HORISEN AG
hotsplots GmbH
HVE Balt-Com Fiber AB
HåboNet AB
Härjeåns Nät AB
Hässleholms kommun
Höganäs Energi AB
Höglandets Optoservice
Högsbynät AB
iCentrex Sweden AB
Icuri AB
Idé & Resurscentrum AB
IDT Retail Europe Limited
imega system ab
inContact Ltd.
Indicate IT AB
Infogram System AB
InformationsTeknik i Norrbotten AB
Inmarsat Solutions (Canada) Inc.
Inmarsat Ventures Ltd
InnoTel AB
Insat Net AB
Intelecom Sweden AB
Interactive digital media gmbh
Interoute Managed Services Sweden AB
IntJoors Holding AB
IntraPhone IT AB
IP Maxi AB
IP Sweden AB
IPC Network Services Limited
Ipify ltd
IP-ONLY AB
IT System i Dalarna AB
IT Åre
IT4U Sweden AB
IT-BO i Stockholm AB
IT-mästaren Mitt AB
ITTRE Sverige AB
iTUX Communication AB
JL Phone Systems AB
Jokkmokks kommun
Jordberga Gård AB
JT Technologies & Telecommunications AB
Junet AB
Junyverse AB
Jönköping Energi AB
Kalix Stadsnät KalixNet AB
Kalix Tele24 AB
Karlsborgs Energi AB
Karlshamn Energi

Karlskoga Stadsnät AB
Karlstads El- och Stadsnät AB
Kinda kommun
Kiruna kommun
KnivstaNet AB
Kommunicera i Umeå AB
KPN Eurorings
Kraftringen Enerig AB (publ)
KumBro Stadsnät AB
Kungsbacka kommun
Kungälv Energi
Kustbandet AB
Kävlinge Kommun
Köpings Kabel-TV AB
LA Cable AB
Laholms Bredbandsbolag AB
Landskrona Energi AB
Lappland Network Services AB
Lebara Media Services Ltd
Lerdals Fiber Ekonomisk Förening
Level 3 Communications AB
Lidén Data Internetwork AB
Lidero Network AB
limitless mobile
LINK Mobility A/S
LINK Mobility AB
Linking Communication B2B AB
Ljungby Energi AB
Ljusnet AB
Lulebo AB
Lunet AB
Lycamoibile Sweden Limited
Lycksele kommun
Lyssna-Njut Euronics AB
Malmö stad för malmö stadsnät
Malungs Elnät AB
Malå kommun
Mark Kraftvärme AB
Media Nework i Halmstad AB
Mediateknik i Varberg AB
Megaport (Sweden) AB
Mi Carrier Service AB
Microtec i Laholm Ab
MIMS Invest AB
miniTel AB
Mitto AG
MKB Nét AB
Mobile Arts AB
MOBIWEB LIMITED
Monty UK Global
Mora Kommun
Motala kommun
Multicom Security AB
Mundio Mobile Sweden Ltd
Munkfors kommun
My Beat AB
Mälardalens Datorförening
Mälarenergi AB
Mönsterås kommun
N4 Qavat AB
Natterbox Ltd
Net at Once Sweden AB
Netcomp System i Blekinge AB
Netett Sverige AB
NetIT Internet Solutions in Sweden AB
Netnod Internet Exchange i Sverige AB
Netsize Internet Payment Exchange AB
Netwest Sweden AB
NextGen Mobile Ltd
Njudung Energi Vetlanda AB
Nordic Digit AB
Nordiska Servercentralen AB
Nordmalings kommun
Norrköping Vatten och Avfall AB
Norrsken AB
Norrtälje Energi AB
Nortech Telecom
Nossebro Energi Försäljnings AB
Nossebroortens Energi Ek För
NTT Europe Limited
Nybro energi AB

Nytel i Sverige AB
Nätbolaget Holding Sverige AB
Obduro Network AB
Obenetwork AB
Office i Kiruna AB
OITP Dalarna AB
Olofströms Kabel-TV AB
Olofströms Kraft AB
On 1 Call Support AB
Orange Business Sweden AB
OrbiGo AB
Orsa Kommun
Oversite AB
Oxelö Energi AB
Pajala kommun
PCCW Global (Sweden) A.B.
PCCW Global B.V.
Peter Lindström Elektronik AB
Phonera Företag AB
Pico Global Ltd.
Profitbyte AB
Pure IP Limited
Pushtalk Group Communication AB
Qall Telecom AB
QuickNet AB
RB Communication AB
Rebtel Networks AB
Region Gävleborg
Retn Baltic AS
Rg19 i Norden AB
Ringson AB
Robertsfors kommun
Rockan Data Center AB
Romelebygdens Kabel-TV AB
Ronneby Miljö&Teknik AB
Rydalink ekonomisk förening
SalaNet AB
Sandviken Energi AB
Sanet Telecom AB
SAP Svenska AB
SavMAN AB
Seniortelefoni Sverige AB
ServaNet AB
Serverado AB
ServIT AB
SEVAB
Shyam Telecom UK Ltd
Sierra Wireless Sweden AB
Sigma IT Consulting Sweden AB
SIHI Scandinavia AB
SIT24AB
Skara Energi AB
Skellefteå Kraft Fibernät AB
Skurups Elverk
Skype Communications, S.A.R.L.
Skövde Kommun
Smedjebacken Energi & Vatten AB
SMS Provider Corp.
Smålands Bredband AB
Sollefteå kommun
Sollentuna Energi & Miljö AB
Sorsele kommun
South Brains AB
SPIRIUS AB
Spkr Direct Communication
STADSNÄT I ÅMÅL AB
Staffanstorps Fibernät AB
Statnett SF
Stockholm Colocation AB
Stockholms Stadsnät AB
Storumans kommun
Straznet AB
Sundbybergs Stadsnätsbolag AB
Suravision AB
Svea Billing Services AB
Swedavia Airport Telecom AB
Svensk Konsumentmobil AB
Svensk Säkerhetstjänst Net i Sverige AB
Svenska IP-Telefonibolaget AB
Svenska Kraftnät
Svenska UMTS-nät AB
Sveriges Telefoni Företag AB

Swisstok Telnet Finland Oy
Switch Nordic Green AB
Swoscom AB
Systemintegration i Växjö
Systempartner i Ljungby AB
Säffle Kommunikation AB
Sävast Kabeltv föreninng
Söderhamn NÄRA
Söderköpings kommun
Sölvesborgs Energi och Vatten AB
Taisto Keskitalo DATA AB
Tata Communications (Sweden) AB
TCN Sverige Ab
TeamViewer GmbH
TechTrade International AB
Teknik i Media Datacenter Stockholm AB
Telavox AB
Tele2 Business AB (förut TDC Sverige AB
Tele2 Sverige AB
Tele4u i Sverige AB
Telecom3 Sverige AB
Teledigit Scandinavia AB
Teleinfo 118800
Tele-Man AB
Telemar Scandinavia AB
Telenor Connexion AB
Telenor Maritime AS
Telenor Sverige AB
Telephonia Telecom AB
TeleProffs Sverige AB
Teleservice Bredband Skåne AB
Teletek 5060 AB
Telge Nät AB
Telia Company AB
Teloteket AB
Telstra Limited
Tenorama Data AB
Teracom AB
Teru HB
The Cloud Networks Nordic AB
Tibro Energi AB
Tictic AB
Tidaholms Energi AB
Tierp FiberNetwork AB
Tingo Mobil AB
TIWS Sweden AB
T-MOBILE HOTSPOT GMBH
Tomelilla kommun
Trafikverket
Tranemo Kommun
Tranquillity
Transaction networl services AB
TRANSATEL SA
TransTK (UK) Ltd
Tranås Energi AB
Trelleborgs Byakontakt
Triangelbolaget D4 AB
Trollhättan Energi AB
Tropo (Europe) Limited
Trosa Fibernät AB
Tuna Kabel-TV AB
Uddevalla Energi AB
Ulricehamns Energi AB
Umeå Energi Umenet Ab
Unicornn Telecom AB
Uno Telefoni AB
UppCom AB
Utsikt Bredband AB
Vaggeryds Energi AB
Vallebygdens Energi ekf
Valvea AB
Vanco Sweden AB
Vansbro kommun
Wantech AB
VaraNet AB
Varasättens Bredband Ekonomisk Förening
Varberg Energi
Vattenfall Eldistribution AB
WCOM AB
Weblink IP Phone AB

Vellinge stadsnät AB
Vellinge Wireless AB
Verizon Sweden AB
West UC Limited
Wexnet AB
ViaEuropa i Sverige AB
Viasat AB
Viatel Sweden AB
Wifog AB
Viking Tech AB
Vilhelmina kommun
Vimmerby kommun
Vindelbostäder AB
Winther Wireless AB
Vixor Wireless Broadband Infrastructure
Vodafone Enterprise Sweden AB
Voice Integrate Nordic AB
Voice Provider
Voicenet Solutions Ltd (TA 8x8 Solutions
Voicetech Sweden AB
Voxbone S.A
Wx3 Telecom AB
Väddö Media Information IS AB
VänerEnergi AB
Vännäs Kommun
Värnamo Energi AB
Västerbergslagens Elnät AB
Västervik Miljö & Energi AB
VÖKBY Bredband AB
Ydre kommun
Ystad Energi AB
Zedcom ISP AB
Åre Network AB
Årjängs Nät AB
Åsele kommun
Älvdalens kommun
Älvsbyns Kommun
Öckerö Fastighets AB/Öckerö Nät
Örecom AB
Öresundsbro Konsortiet
Öresundskraft AB
Österlens Kraft AB
Österåkers Stadsnät AB
Östhammars Stadsnät (Östhammars kommun)
Överkalix kommun
Övertorneå kommun
Övik Energi AB

3 Changes in statistics

The following changes were noted in the reported data for 2016.

Acquisitions
See separate document about participants.

Change of name:
See separate document about participants.

Historical corrections
Some operators has corrected their historical data since the last publication. These corrections are now included in the statistics portal and Excel-tables. See also separate document about corrections.

Changes after publication
The collection of operator data continues even after the *Swedish Telecommunications Market* report is published, which makes it so that the PTS database for operator statistics is continually improved, and the frequency of response increases. See statistik.pts.se and www.pts.se). For the absolute latest statistics, refer to the statistics portal online.

4 Report tables

Available in a separate document.

5 Quality declaration

B.0 Introduction

'The Swedish Telecommunications Market' represents a data compilation conducted twice annually. The results are presented on a statistics portal (www.statistk.pts.se) and also in summary form in a report.

B.1 Contents

1.1 Statistical target characteristics

The compilation gathers information about the number of subscriptions broken down by subscription type, traffic broken down according to kind of traffic and revenues from the retail market in respect of the market for mobile call services. This information is reported in certain cases split between private and business, respectively.

1.2 Objects and population

The target population comprises a sample selection of undertakings that have conducted operations within the market for electronic communications. The framework population comprises those undertakings that have given notice to PTS that they intend to conduct telecom operations according to Chapter 2, Section 1 of the Electronic Communications Act (LEK). Undertakings subject to a notification obligation are provided by PTS in a register. In addition to this, there are also a number of undertakings within the market for broadcasting and a number of public stakeholders.

1.3 Variables

Data collection is conducted by means of a web questionnaire. The compilation includes variables as regards:

- Subscriptions (number and type)
- Traffic volumes (number of minutes, calls, bytes, sms, mms)
- Revenues (SEK)
- Market shares (based on number of subscriptions)

1.4 Statistical measures

Data collected is reported as number, in SEK, bytes, bit per second, as an average per household, number per minute and as number per 1,000 inhabitants.

1.5 Study domains

Data is presented in five areas: fixed call services, mobile voice and data services, Internet services, television services, and bundled subscriptions. There are reports broken down into private and business.

1.6 Reference times

This data compilation relates to the calendar year 2016.

1.7 Comprehensiveness

The data compilation 'The Swedish Telecommunications Market' is an independent survey, but PTS also gathers in data annually concerning broadband access lines.

B.2 Accuracy

2.2 Overall accuracy

The Swedish Telecommunications Market is a comprehensive survey that does not have any measurement of uncertainty, though there is uncertainty. The data compilation has a high response frequency, 95% for the 2016 compilation. However, the framework population may be smaller than the target population, an uncertainty that is considered to be low as PTS's register quality is considered overall to be good.

Partial attrition is reduced in part by the inclusion of responses from previous years in the web questionnaires to assist the respondents when completing the questionnaire, and also by the incorporation of certain blocks that require the respondents to provide an explanation in the event of an excessive deviation from responses provided in previous years. Systematic errors occur, and are reduced partly by data for various sizes being checked against each other to identify deviating information.

2.3 Sources of inaccuracy

Besides inaccuracy resulting from the survey being a sample survey, the result is affected by a further number of sources of error, for instance partial attrition, under and over coverage and various kinds of measurement error.

1. Estimating

Estimates are made of the half-year data through the responses from the full-year survey being added to the total for those operators that are not included in the sampling selection. This means that regard is not taken to any changes in the form of increases or reductions within that group and that those increases or reductions seen for the sample are underestimated.
In addition to this there are also estimates for individual operators. These estimates are made on the basis of the previous responses submitted by company and subsequently sent back to the operator for approval.

2. Measurement errors

Measurement errors arise when an operator answers the questionnaire but does not provide the true value. This may be the result of neglect, inadequate or misunderstood instructions or that it was not possible for any exact value to be established from the businesses' accounts. Several operators have, for instance, not had access to reliable documentation for reporting volume data.

3. Processing

The information gathered undergoes processing and if necessary correction, sometimes following supplementary information from undertakings.

B.3 Timelines

3.1 Frequency

The data collection is collected twice annually, on half-year and full-year basis. For the half-year report, the data collection comprises fewer variables and is based on a sample of the target population.

3.2 Production time

Four months; publication occurs approximately one month after data collection is concluded.

3.3 Punctuality

Six months after the end of the survey period, according to the plan.

B.4 Comparability and coherence

4.1 Comparability over time

For detailed information about breaks in time series, reformulated intervals, etc., see the tables published on the PTS statistics portal (www.statistik.pts.se).

4.2 Comparability between groups

Certain variables in the data presentation are also included in other statistics:

- Households. Statistics Sweden (SCB) annually publishes statistics on the number of households in Sweden.
- Population of Sweden. SCB also annually publishes statistics concerning the population of Sweden.

4.3 Coherence with other statistics

Since 2003, PTS collects statistics for the full-year report in cooperation with SCB and Trafikanalys, which means that the statistics published from 2003 an onwards by PTS and Trafikanalys can be used jointly. For the years before 2003, there may be certain differences as a consequence of separate statistical processing. There is no corresponding information for the data collected on half-year basis.

4.4 Availability and clarity

The results of the data collection are presented on a statistics portal in the form of tables. The results are also compiled in this report, 'The Swedish Telecommunications Market'.

4.5 Forms of dissemination

Both the statistics portal and the report are publicly available on the web. All information is also published in English.

4.6 Documentation

This document represents the quality documentation.

4.7 Access to primary material

All material is presented in the form of tables on the PTS statistics portal. Primary data can usually be provided to the general public upon request.

4.8 Further information can be provided by

- Karin Fransén, PTS, telephone +46(0)8-678 55 00, e-mail: karin.fransen@pts.se
- Andreas Wigren, PTS, telephone +46(0)8-678 55 00, e-mail: andreas.wigren@pts.se