

A ICT Infrastructure

This chapter examines trends in the available services provided within **fixed** and **mobile electronic communication networks** measured mainly by number of **voice (telephone)** and **broadband (data) subscriptions**. Data used in this chapter are collected from **the providers** of these services (supply side) and should be distinguished from data based on ICT users' surveys (demand side).

The reference period: end of the year unless otherwise stated.

Definitions

- A **Domain** (an **Internet domain** or also a **domain name**) is a unique name (identifier) of a computer to the Internet. The domain of second level is registered at a registrar authorized to administer respective top-level domains. The national top-level domain in the Czechia is **.cz** and **www.czso.cz** could be an example of second-level domain.
- A **subscriber** to publicly accessible **voice** and **data** services in **fixed** and **mobile communication networks** shall mean a legal or natural person, which has concluded a contract on the use of such services with a provider. *Data in the tables and figures include solely services provided in the retail segment, i.e. services provided to end users.*
- The **Fixed telephone infrastructure** is measured by number of active **voice subscriptions** in a fixed network by means of 'traditional' **PSTN** residential and business **telephone lines** and by means of **VoIP stations**.
- The **Mobile telephone infrastructure** is measured by number of **SIM cards** that have been used at least once in the last three months for voice or data communication. *The SIM cards are **prepaid ones**, in which case the customer does not conclude any contract with the provider yet buys a credit; and **postpaid ones** in which case customers have a contract concluded with the provider and pay for contracted services by monthly invoice.*
- **Machine-To-Machine (M2M)** embedded mobile cellular subscription includes SIM cards designed exclusively for wireless communication between machines, devices and IS without direct human intervention and which are not part of a consumer subscription. Note: It includes cards in personal navigation devices, smart meters, trains, cars, etc.
- The **Broadband access** is an access to the Internet with nominal speed ≥ 256 kb/s towards the subscriber (download).
- The **Fixed broadband** is measured on the basis of so-called access points (active connections) where subscribers are provided with the Internet access from a fixed point for one of technology as follows: xDSL (incl. FTTCab), cable television network (CATV), access via an optical fibre (FTTH/B), and wireless connection (e.g. WiFi).
- The **Fixed wireless access (FWA)** is the terrestrial internet connection by means of a radio system including non-licensed frequency (WiFi). It is characteristic by placing of the end point device on a fixed location (house, apartment).
- The **Mobile broadband** includes internet connection over mobile network using: i) **handset-based (Voice and Data)** mobile broadband subscriptions measured by number of active data SIM cards installed in telephones or other handset devices within standard voice services or ii) **computer-based (Data only)** mobile data subscriptions measured by number of active USB keys, dongles or SIM cards installed in computers or tablets for using data services separated from voice services.

Data for **Czechia** are taken from data sources of the Czech Telecommunication Office (hereinafter CTO), except for the number of registered domains which is taken from **cz.nic**. Further information can be found at www.ctu.cz and www.nic.cz.

International comparisons is based on publicly available data from the ITU, OECD and European Commission.

Further information on this theme can be found at: <https://bit.ly/2K9wKEo>

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Tab. A1 Fixed telephone subscriptions in Czechia

	Thousand		
	2015	2017	2018
Total	1 896	1 633	1 506
By type of subscriber			
Individuals (households)	831	614	606
Legal entities (enterprises)	1 065	1 018	900
By technology (network)			
Switched network - PSTN lines	994	740	665
Individuals - PSTN residential lines	523	355	311
Legal entities - PSTN business lines	471	385	354
Internet network - VoIP lines	902	893	841
Individuals (households)	309	259	295
Legal entities (enterprises)	594	634	546

PSTN: Public Switched Telephone Network; VoIP: Voice over Internet Protocol

Figure A1 Fixed telephone subscriptions - PSTN lines

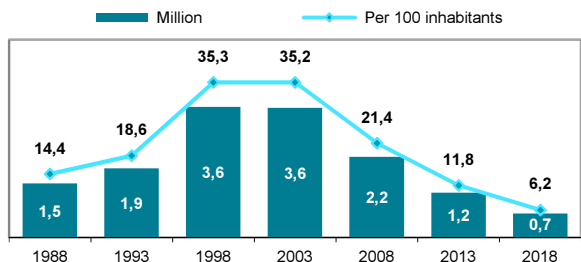


Figure A2 PSTN fixed telephone lines by subscriber (million)

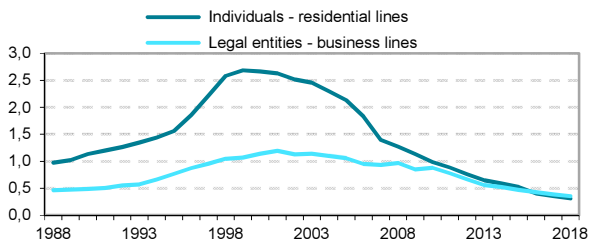
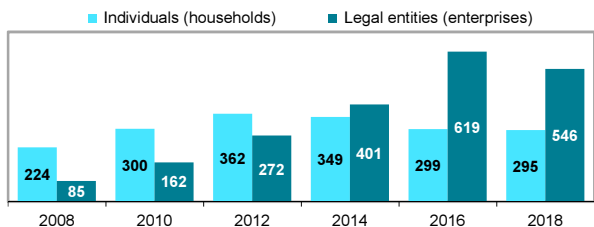


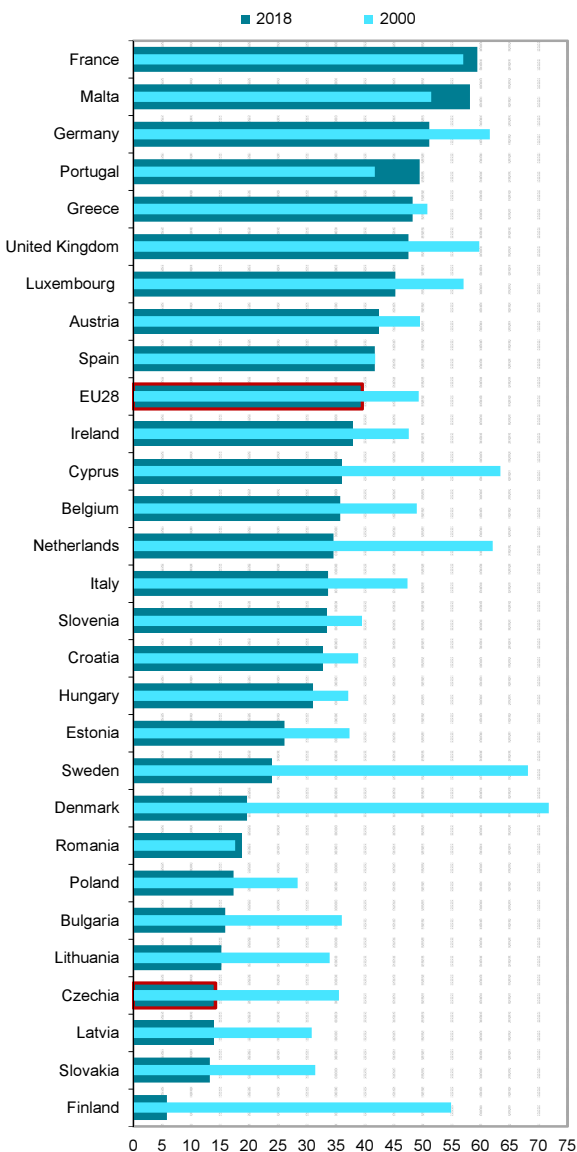
Figure A3 VoIP fixed telephone subscriptions (thousand)



Source: CZSO calculations based on Czech Telecommunication Office data

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**Figure A4 Fixed telephone subscriptions*
in EU countries (per 100 inhabitants)**



* It includes active voice subscriptions in fixed network using both traditional PSTN (Public Switched Telephone Network) lines or VoIP (Voice over Internet Protocol) technology.

Source: CZSO calculations based on ITU data

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Tab. A2 Mobile telephone subscriptions in Czechia

Thousand

	2015	2017	2018
Total*	14 017	14 511	14 756
By type of subscriber			
Individuals	9 222	9 144	9 097
Legal entities (enterprises)	4 795	5 367	5 658
By type of subscription (SIM card)			
Prepaid SIM cards	4 893	4 656	4 480
Postpaid SIM cards	9 124	9 855	10 276

* The indicator applies to mobile-cellular subscriptions that offer voice or data communication. It includes SIM cards that have been used at least once in the last 3 months. Machine-to-Machine (M2M) SIM cards are excluded.

Figure A5 Mobile telephone subscriptions

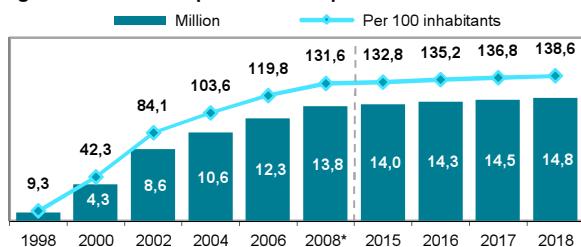
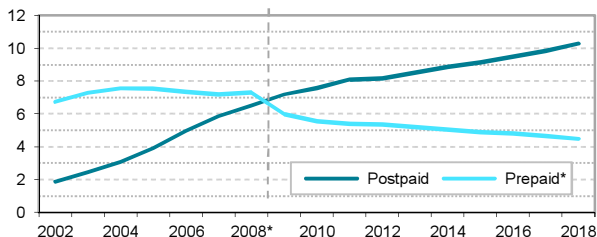
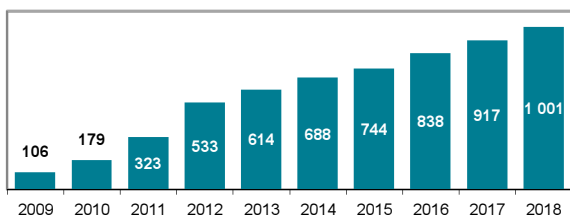


Figure A6 SIM cards used for voice communication (million)



* Break in time series. Since 2008 only prepaid SIM cards used at least once in the last 3 months are included. Until 2017 at least once in the last 13 months.

Figure A7 Machine-To-Machine (M2M) subscriptions* (thousand)

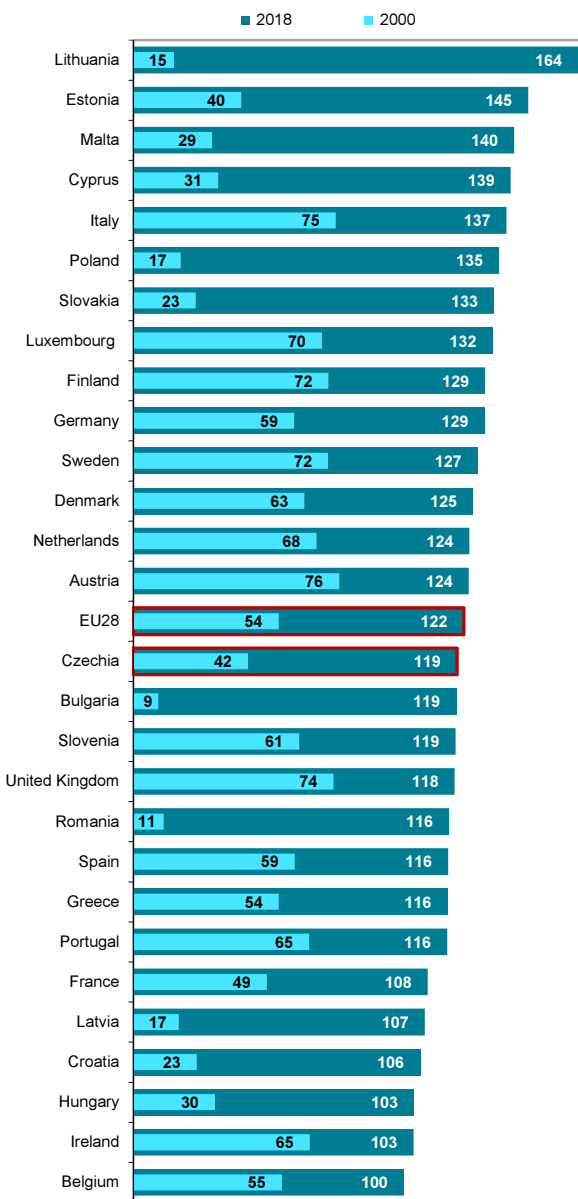


* Machine-To-Machine (M2M) embedded mobile cellular subscription includes SIM cards designed exclusively for wireless communication between machines, devices and IS without human intervention.

Source: CZSO calculations based on Czech Telecommunication Office data

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Figure A8 Mobile telephone subscriptions in EU countries (per 100 inhabitants)



Source: CZSO calculations based on ITU data

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Tab. A3 Fixed telephone traffic in Czechia

	Million outgoing called minutes		
	2015	2017	2018
Total	1 765	1 514	1 420
By type of subscriber			
Calls made by individuals as subscriber	.	692	620
Calls made by legal entities as subscriber	.	822	800
By technology			
Calls generated from traditional PSTN lines	1 117	963	886
Calls generated from VoIP	648	550	534
By destination and network			
Domestic calls, total	1 498	1 321	1 275
Fixed-to-fixed telephone traffic	1 007	709	628
Fixed-to-mobile telephone traffic	491	612	647
International calls	110	95	89

PSTN: Public Switched Telephone Network; VoIP: Voice over Internet Protocol

Figure A9 Domestic calls from fixed network (minutes)

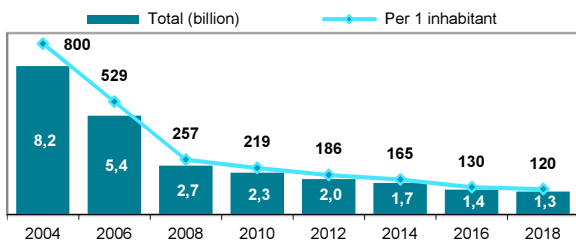


Figure A10 Domestic calls from fixed network by technology (million outgoing minutes)

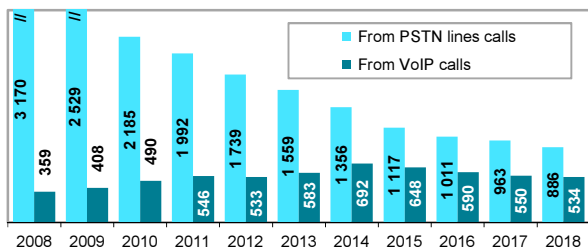
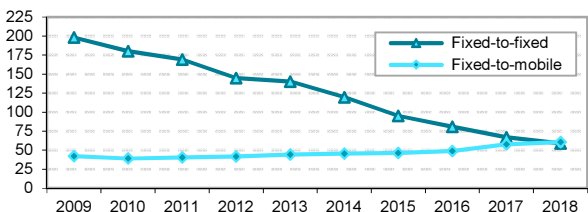


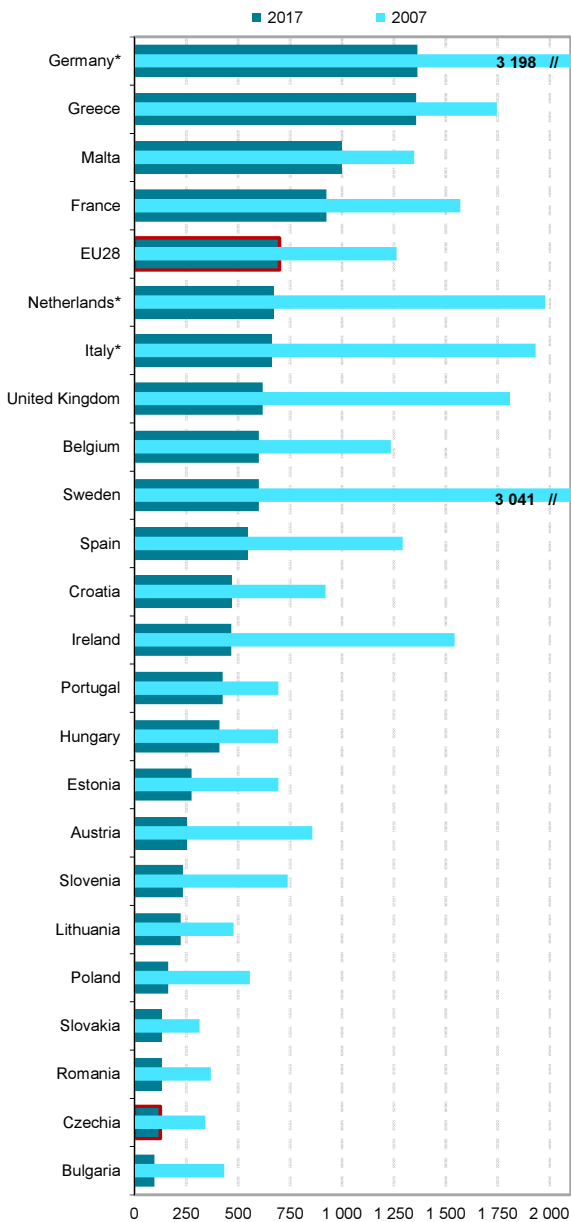
Figure A11 Domestic fixed telephone voice traffic by network (outgoing minutes per one inhabitant)



Source: CZSO calculations based on Czech Telecommunication Office data

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Figure A12 Domestic fixed telephone traffic in EU countries (outgoing called minutes per 1 inhabitant)



* 2005 instead of 2007

Source: CZSO calculations based on ITU data

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Tab. A4 Mobile telephone traffic in Czechia

	Million outgoing called minutes		
	2015	2017	2018
Total*	20 635	21 328	21 556
By type of subscriber			
Calls made by individuals as a subscriber	11 550	11 591	11 685
Calls made by legal entities as a subscriber	9 084	9 737	9 870
By destination and network			
Domestic calls, total	20 176	20 907	21 152
To the same mobile carrier	11 660	11 482	11 443
To the different mobile carrier	7 694	8 587	8 889
To fixed telephone network	822	838	821
International calls (including roaming)	760	1 215	1 553

* outgoing called minutes from outbound roaming are excluded here

Figure A13 Domestic calls from mobile network (minutes)

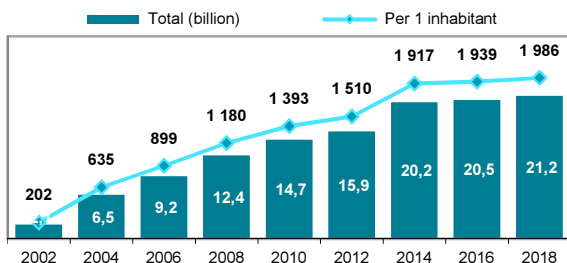


Figure A14 Domestic calls from mobile network by destination

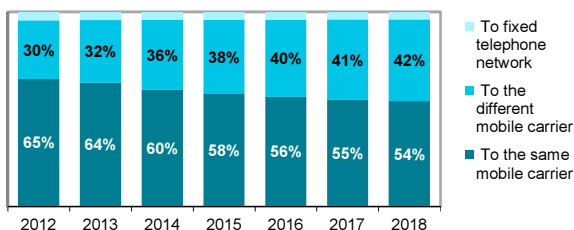
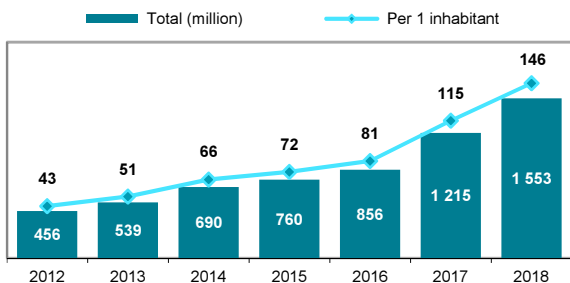


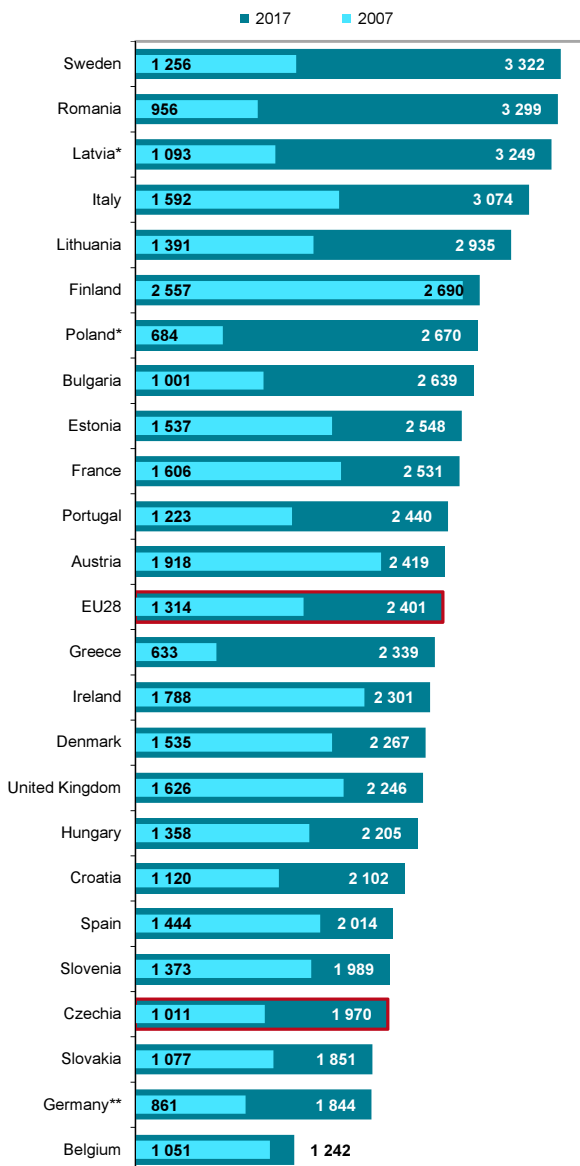
Figure A15 International calls from mobile network (minutes)



Source: CZSO calculations based on Czech Telecommunication Office data

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Figure A16 Domestic mobile telephone traffic in EU countries (outgoing called minutes per one inhabitant)



* 2006 instead of 2007

** 2014 instead of 2017

Source: CZSO calculations based on ITU data

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Tab. A5 Fixed broadband subscriptions in Czechia

	Thousand		
	2015	2017	2018
Total	2 963	3 134	3 212
<i>By type of subscriber</i>			
Individuals (households)	2 500	2 649	2 727
Legal entities (enterprises)	463	485	485
<i>By technology and network</i>			
Fixed wired access, total	1 959	2 035	2 107
DSL line	941	876	888
Cable modem (CATV)	541	589	597
Fibre (FTTH/B)	476	570	622
Fixed wireless access (FWA - WiFi)	1 004	1 099	1 105

Figure A17 Fixed broadband internet subscriptions

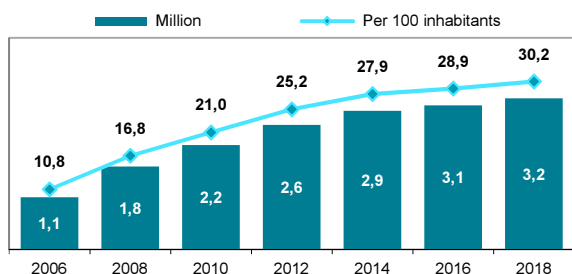


Figure A18 Fixed wired broadband subscriptions by technology (thousand)

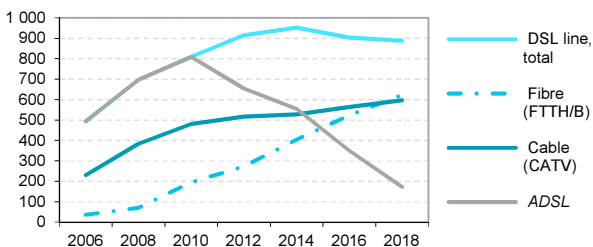
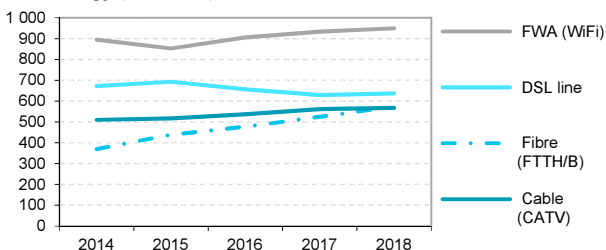


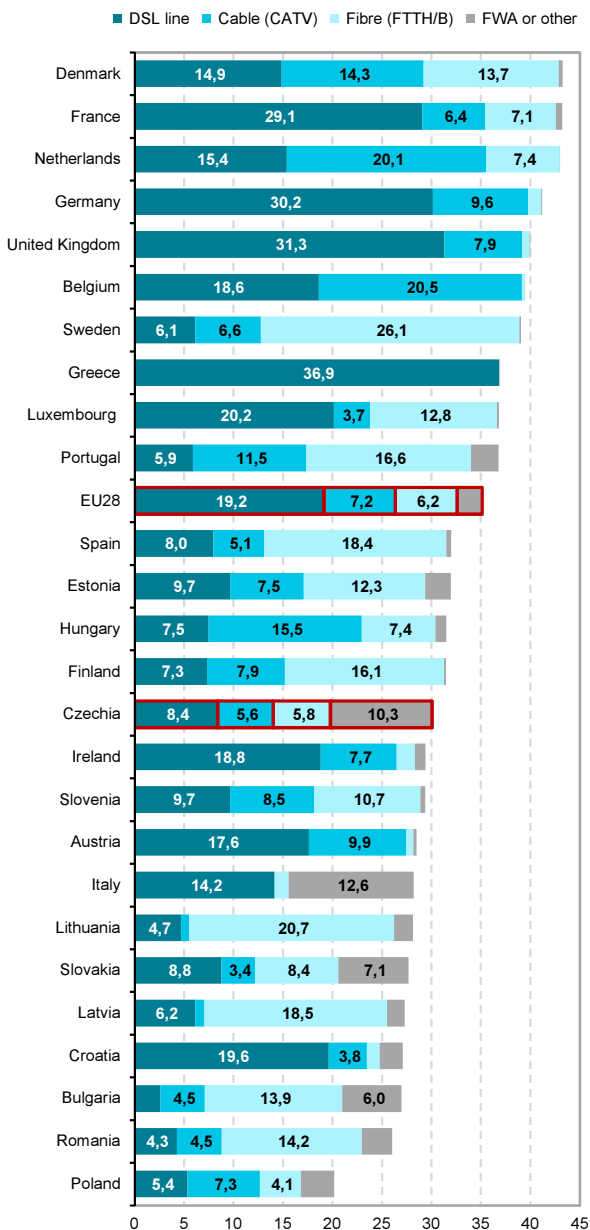
Figure A19 Households fixed broadband subscriptions by technology (thousand)



Source: CZSO calculations based on Czech Telecommunication Office data

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Figure A20 Fixed broadband subscriptions in EU countries by technology; 2018 (per 100 inhabitants)



Source: CZSO calculations based on OECD data

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Tab. A6 Fixed broadband subscriptions in Czechia by speed*

	Thousand		
	2015	2017	2018
Total	2 963	3 134	3 212
By speed tiers			
< 10 Mbps	848	513	353
≥ 10 < 30 Mbps	1 100	1 140	1 119
≥ 30 < 100 Mbps	679	731	916
≥ 100 Mbps	335	749	823

* contracted (advertised) maximum download speed

Figure A21 Fixed broadband subscriptions ≥ 30 Mbps

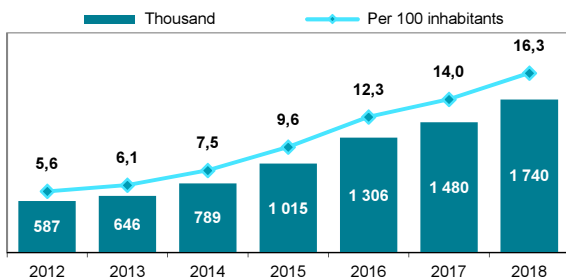


Figure A22 Fixed broadband subscriptions by speed tiers

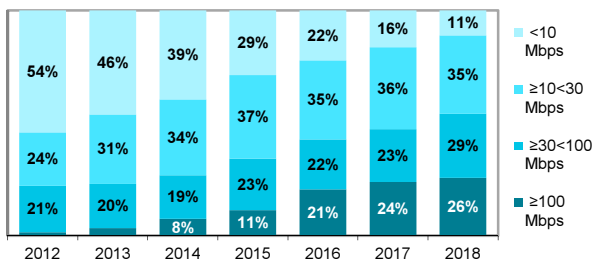
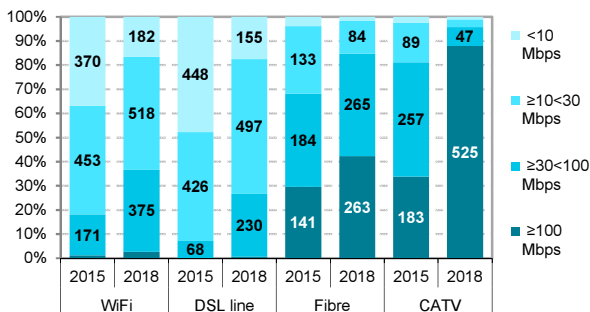


Figure A23 Fixed broadband subscriptions by technology and speed tiers (thousand; %)



Source: CZSO calculations based on Czech Telecommunication Office data

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Figure A24 Fixed broadband subscriptions ≥ 30 Mbps in EU countries; June 2019 (per 100 inhabitants)

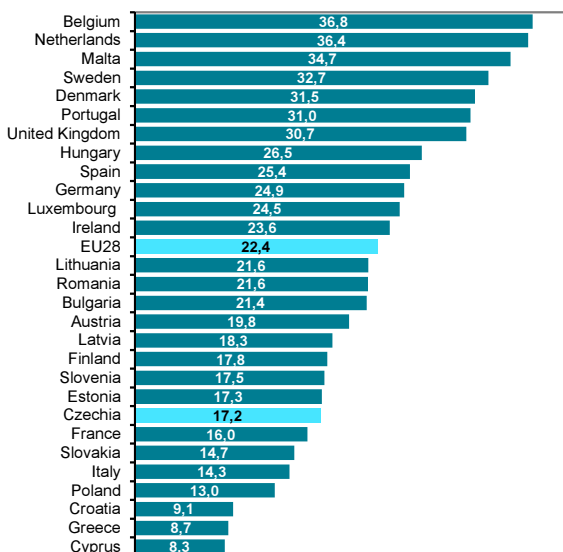
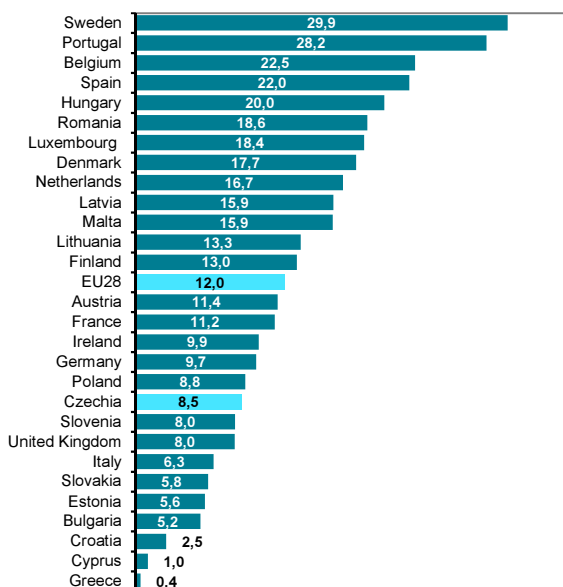


Figure A25 Fixed broadband subscriptions ≥ 100 Mbps in EU countries; June 2019 (per 100 inhabitants)



Source: CZSO calculations based on European Commission data

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Tab. A7 Mobile broadband subscriptions in Czechia

	Thousand		
	2015	2017	2018
Total	7 918	8 777	9 384
by package type and device			
Data&Voice: handset-based (SIM cards)			
mobile data subscriptions, total	7 100	7 748	8 333
Temporary "ad-hoc" access	2 068	1 461	1 494
Permanent access (monthly tariffs)	5 032	6 288	6 839
Data only: computer-based			
mobile data subscriptions, total	818	1 028	1 050
of which fixed-LTE subscriptions	.	227	358

Figure A26 Mobile broadband subscriptions

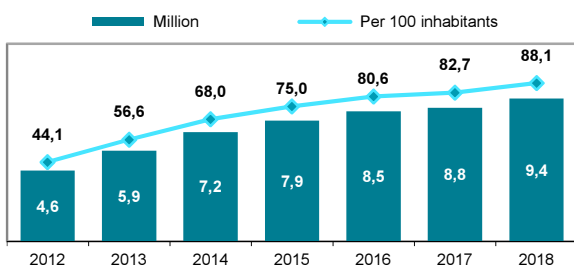


Figure A27 SIM cards with a permanent data and voice mobile broadband subscription

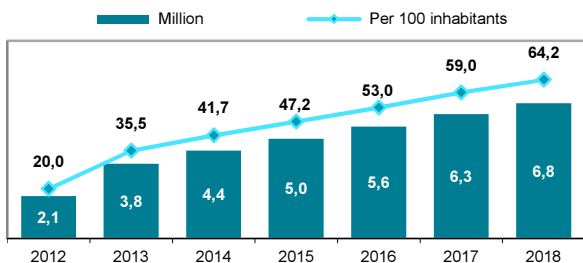
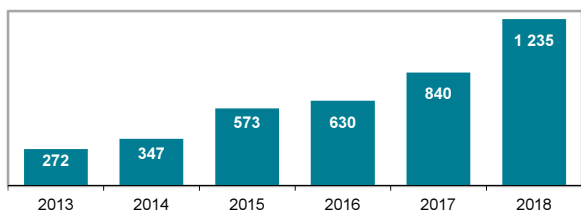


Figure A28 Average mobile data consumption* (megabytes per one active SIM card used for data services)

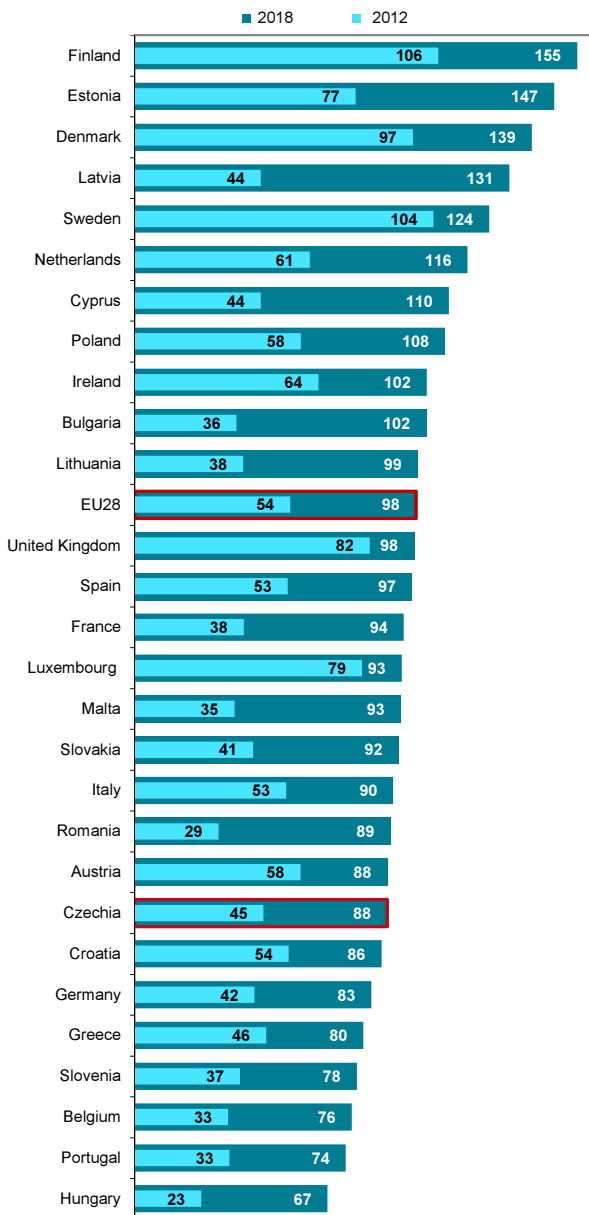


* fixed-LTE subscriptions are not included

Source: CZSO calculations based on Czech Telecommunication Office data

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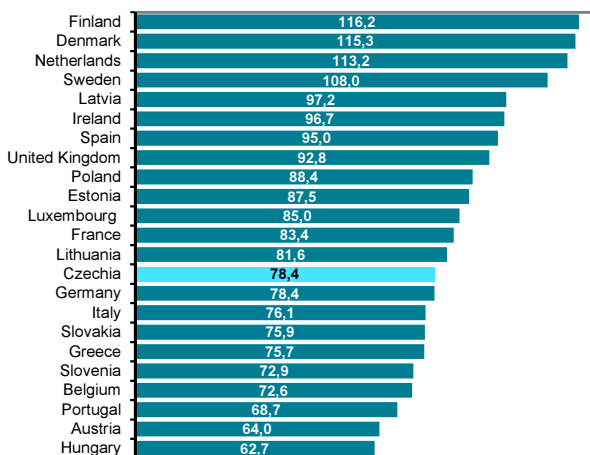
Figure A29 Mobile broadband subscriptions in EU countries (per 100 inhabitants)



Source: CZSO calculations based on European Commission data

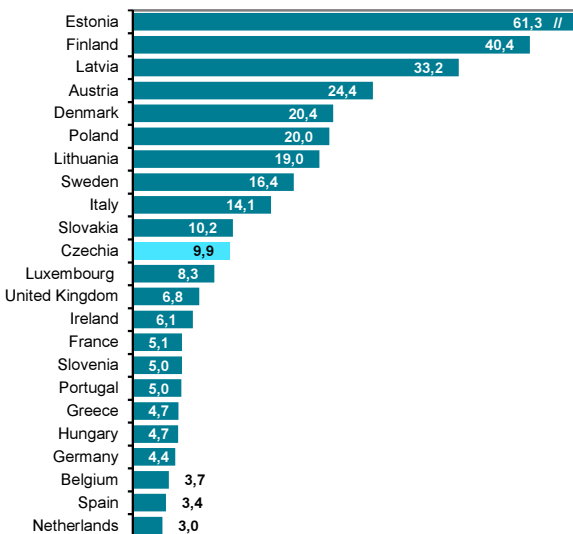
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Figure A30 Voice and data mobile broadband subscriptions* in EU countries; 2018 (per 100 inhabitants)



* Handset-based mobile broadband subscriptions - active data SIM cards installed in telephones or other handset devices for using both voice and data services in the mobile network.

Figure A31 Data only mobile broadband subscriptions* in EU countries; 2018 (per 100 inhabitants)

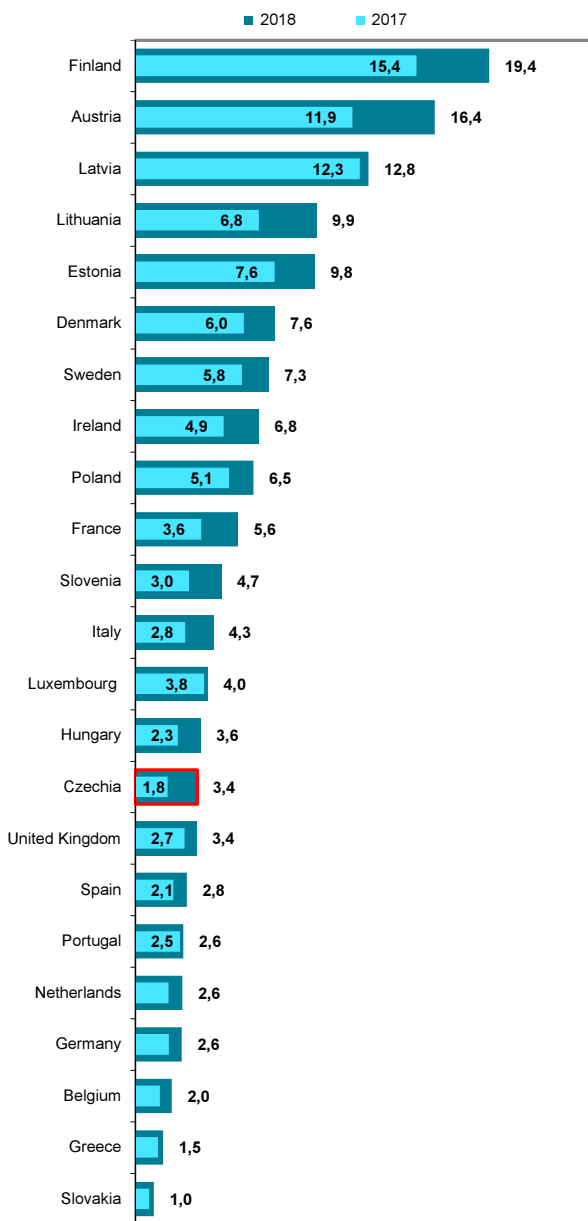


*Computer-based mobile data subscriptions - active USB keys, dongles or SIM cards installed in computers or tablets for using data services only in the mobile network.

Source: CZSO calculations based on OECD data

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Figure A32 Monthly mobile data consumption in EU countries (GB per one mobile broadband subscriber)



Source: CZSO calculations based on OECD data

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Tab. A8 Number of (.CZ) second-level domains in Czechia

	Thousand		
	2015	2018	2019
Total	1 230	1 323	1 329
Domains protected by DNSSEC	477	723	787
Domains using IPv6 protocol	314	412	422
By registrant's country			
Czechia	.	1 227	1 234
Slovakia	.	22,7	23,5
Germany	.	15,8	16,0
United States of America	.	8,9	9,4
United Kingdom	.	5,1	5,4
other countries	.	26,1	34,4

Figure A33 Number of (.CZ) second-level domains

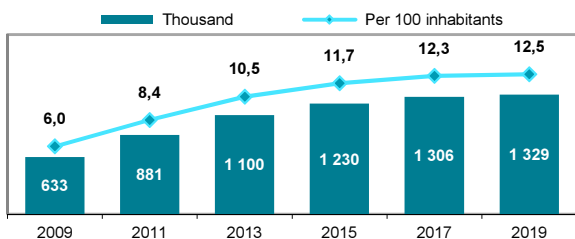


Figure A34 Number of registrated and revoked (.CZ) second-level domains (thousand)

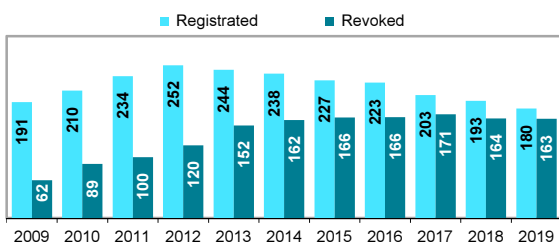
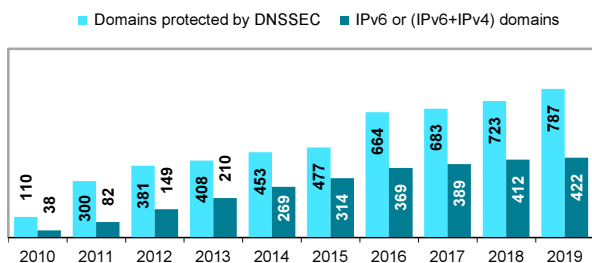


Figure A35 Number of (.CZ) second-level domains protected by DNSSEC and using IPv6



Source: CZSO calculations based on CZ.NIC data