

The state of 4G and 5G pricing, 1H2022 – country rankings

Prices of 4G&5G smartphone plans continued to fall in EU in 1H2022. The median monthly price of smartphone plans in EU fell to 19 EUR in 1H2022. The median price of 4G plans fell to 15 EUR while the median price of 5G plans fell to 28 EUR. Prices of 5G plans continued to fall faster than 4G plans (~18% per annum versus ~12%). The Canadian wireless market, a de-facto network duopoly, was again ranked as the most expensive market among 50 European, American, Asia Pacific, Middle East and African countries.

Rewheel research PRO study, Digital Fuel Monitor 17th release – May 2022

Smartphone plans



Median monthly price € 19

Median gigabyte price € 0.7

Mobile broadband plans



Median monthly price € 18

Median gigabyte price € 0.3

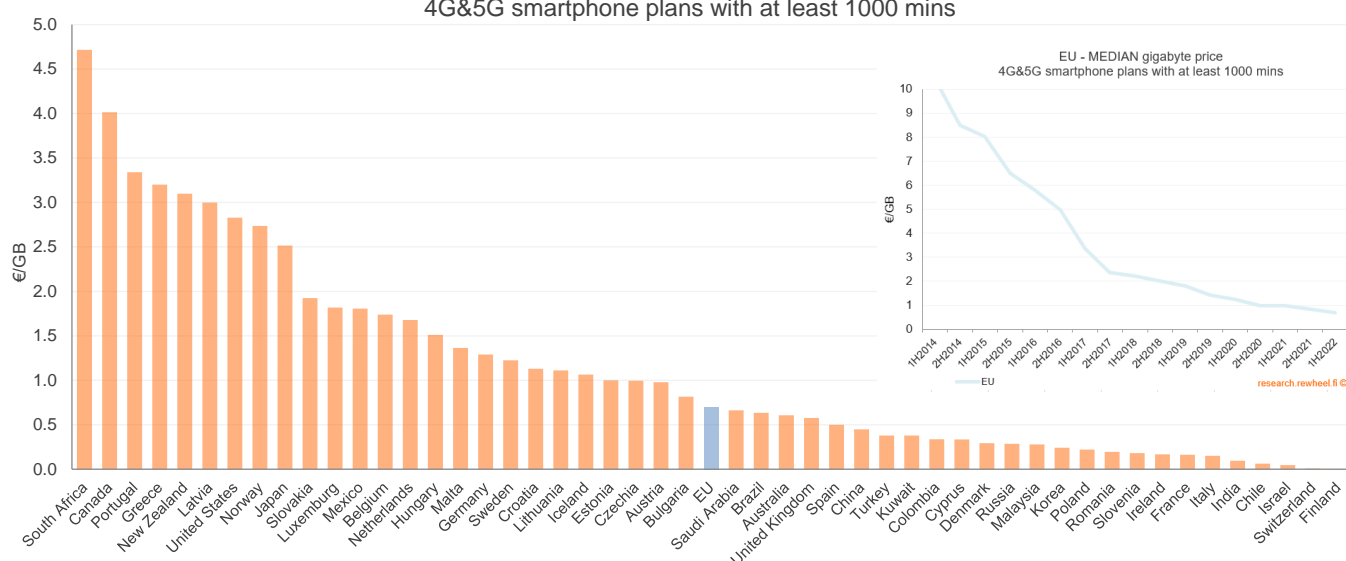
Wireless broadband plans (FWA)



Median monthly price € 25

Median Terabyte price € 6

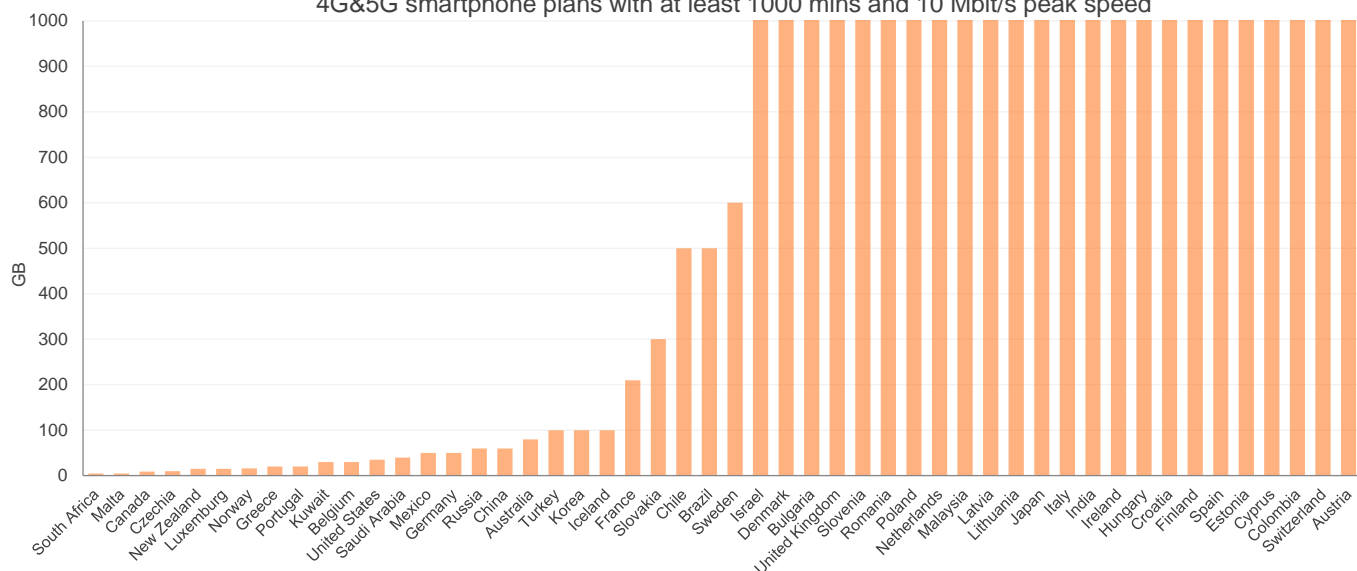
MEDIAN gigabyte price - 1H2022
4G&5G smartphone plans with at least 1000 mins



Fully allocated gigabyte price: tariff retail monthly price (incl. VAT & tax) divided by included gigabyte allowance.
Median fully allocated gigabyte price among all eligible tariffs logged in the database for country or group of countries.
Unlimited data volume tariffs had no finite gigabyte volume (i.e. no throttling or deprioritization).

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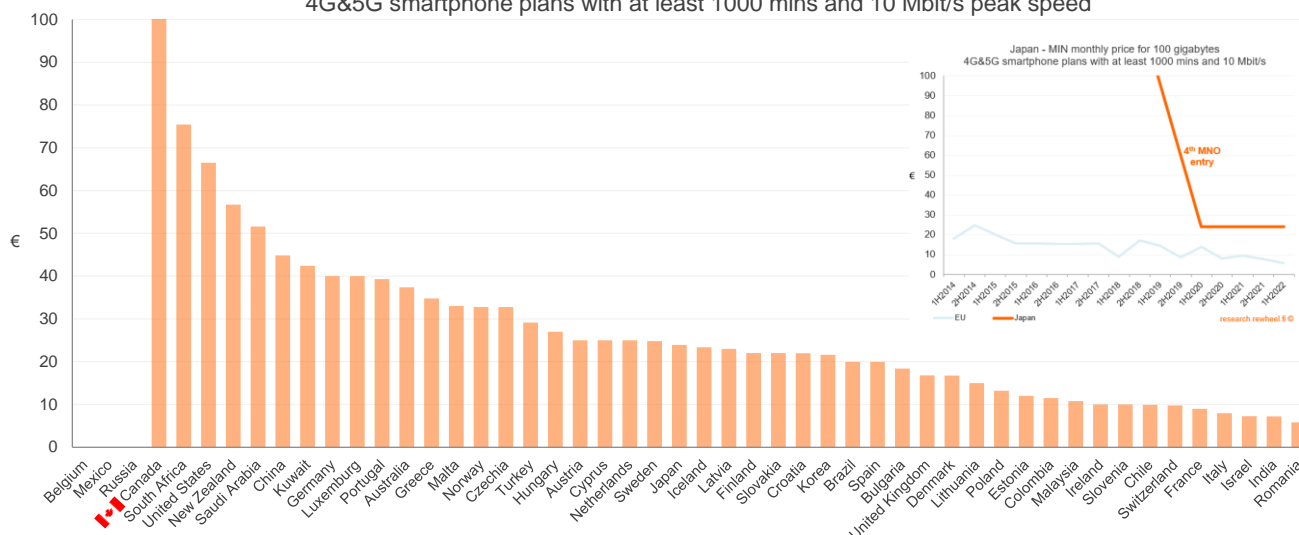
MAX gigabytes that 30 EUR bought - 1H2022
4G&5G smartphone plans with at least 1000 mins and 10 Mbit/s peak speed



Maximum gigabytes that a given monthly EUR amount bought among all eligible tariffs logged in the database for country.
Unlimited data volume tariffs had no finite gigabyte volume (i.e. no throttling or deprioritization).

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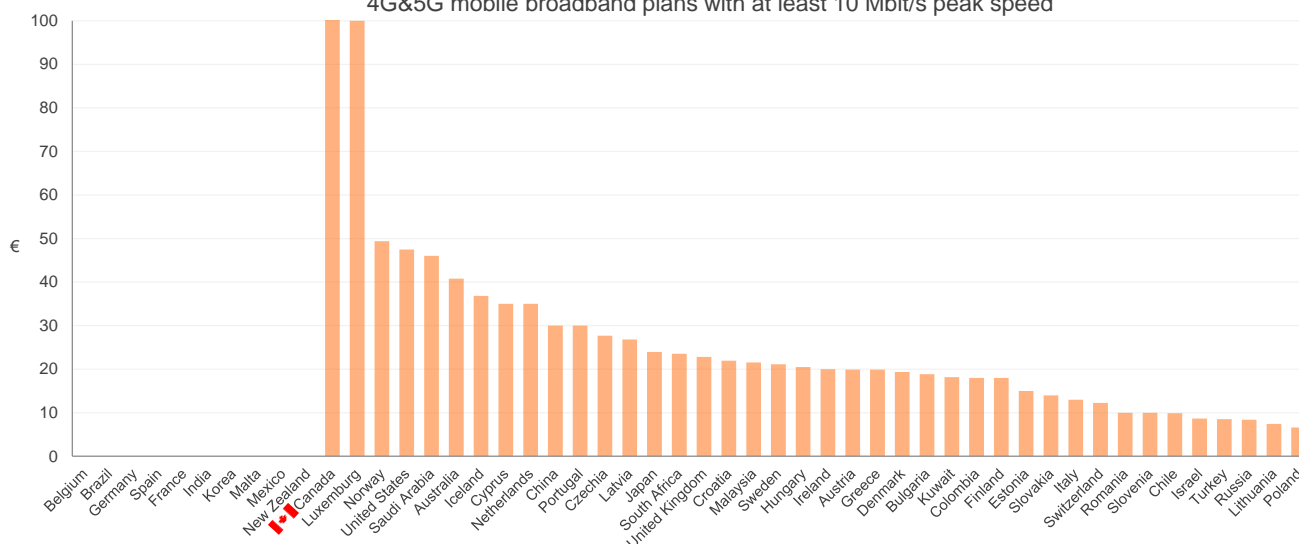
MIN monthly price for 100 gigabytes - 1H2022 4G&5G smartphone plans with at least 1000 mins and 10 Mbit/s peak speed



Minimum monthly retail price (incl. VAT & tax) for a given gigabyte allowance among all eligible tariffs logged in the database for country. Unlimited data volume tariffs had no finite gigabyte volume (i.e. no throttling or deprioritization).

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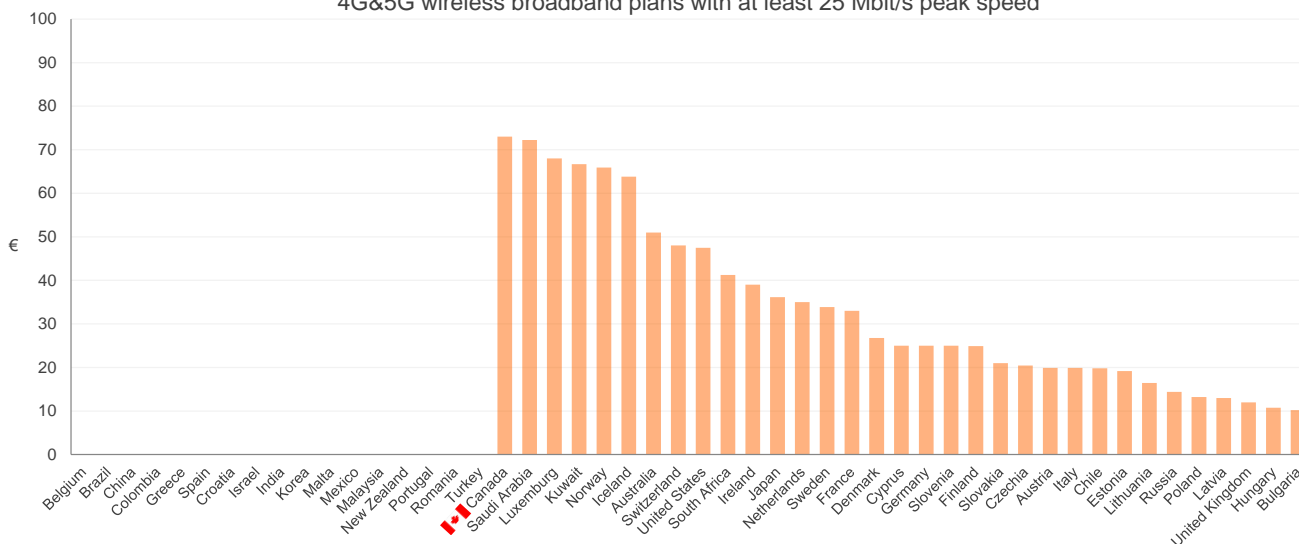
MIN monthly price for 100 gigabytes - 1H2022 4G&5G mobile broadband plans with at least 10 Mbit/s peak speed



Minimum monthly retail price (incl. VAT & tax) for a given gigabyte allowance among all eligible tariffs logged in the database for country. Unlimited data volume tariffs had no finite gigabyte volume (i.e. no throttling or deprioritization).

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MIN monthly price for 1000 gigabytes (1 Terabyte) - 1H2022 4G&5G wireless broadband plans with at least 25 Mbit/s peak speed



Minimum monthly retail price (incl. VAT & tax) for a given gigabyte allowance among all eligible tariffs logged in the database for country. Unlimited data volume tariffs had no finite gigabyte volume (i.e. no throttling or deprioritization).

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Country Highlights

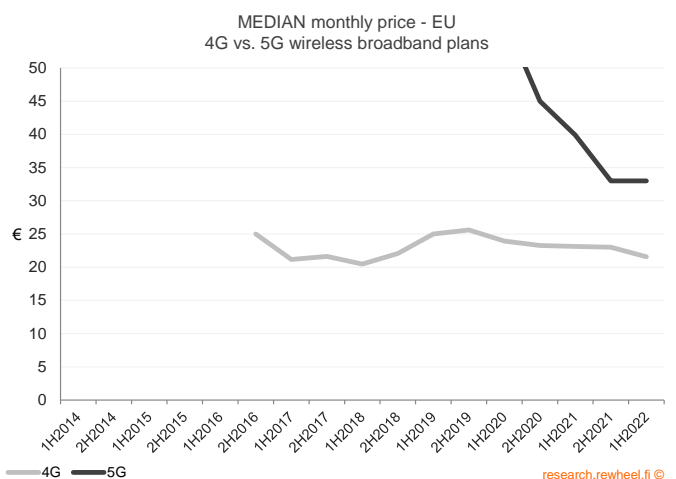
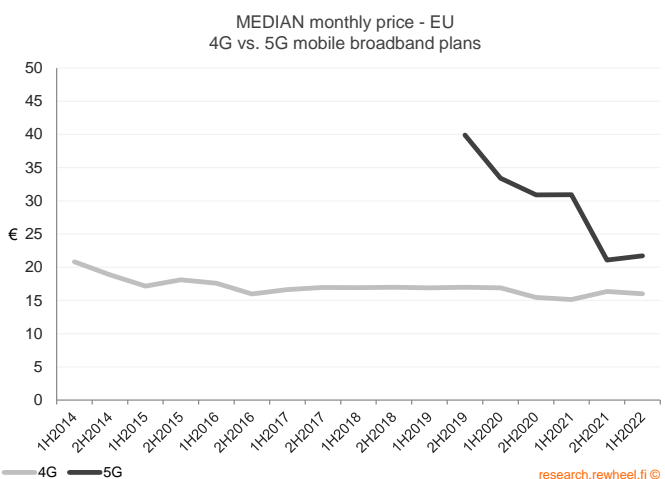
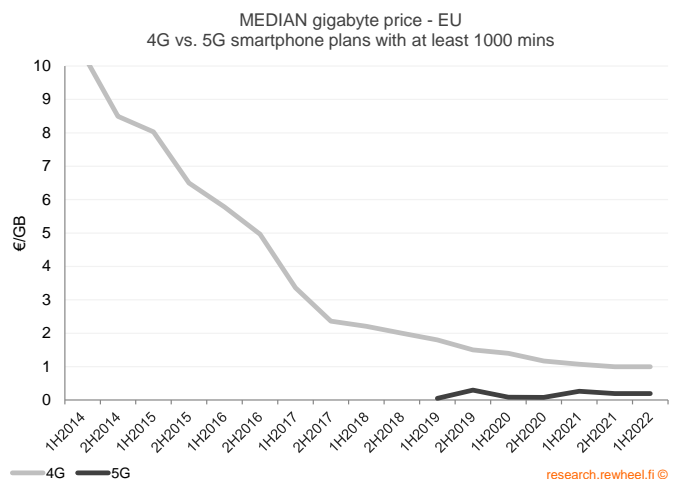
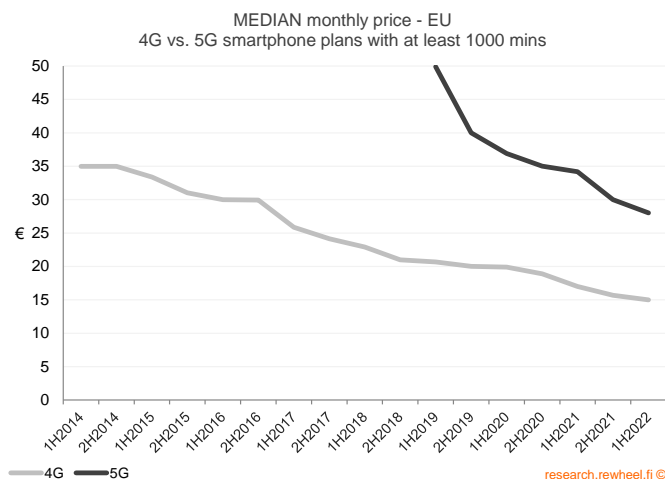
- Prices in the Canadian wireless market (de-facto network duopoly¹) continued to be the highest or among the highest in the world in 1H2022.
- During April 2022 the MIN monthly price for a 4G&5G smartphone plan with at least 1000 mins, 10 Mbit/s and 100 gigabytes was 14x more expensive in Canada than in France.
- Japan: Following Rakuten's 4th MNO launch, prices in Japan fell in 2021 and in 1H2022, but not fast enough and not across the board.
- The median gigabyte price of 4G&5G smartphone plans in the Israeli market (transitioning from 5 to 4 MNOs) fell to 0.04 EUR.
- Israeli consumers buy 4G smartphone plans with unlimited minutes and 200 gigabytes for ~7 EUR per month while 5G smartphone plans with unlimited minutes and 1 or 1.5 Terabytes (1000 or 1500 gigabytes) cost ~16 to ~17 EUR per month.

What's new

- 4G and 5G prices from 50 European, American, Asia Pacific, Middle East and African countries.
- Brazil, China, Colombia, India, Kuwait, Malaysia, Russia, Saudi Arabia and South Africa were added in 2020/2021.
- The 50 countries tracked have a combined population of ~4.8 billion (more than 60% of the world's population).
- 4G and 5G prices from 169 operator main brands, 90 operator sub-brands and 73 major MVNOs.

4G and 5G pricing trends in EU

- The median monthly price of 4G and as well 5G smartphone plans in EU continued to fall in 1H2022.
- The median gigabyte price of 4G and as well 5G smartphone plans in EU were flat in 1H2022.
- The median gigabyte price of 5G smartphone plans in EU was 5x lower in 1H2022 than the median gigabyte price of 4G plans.
- The median monthly prices of 5G mobile broadband and wireless broadband plans in EU stop falling in 1H2022.
- The median monthly prices of 4G mobile broadband and wireless broadband plans in EU fell slightly in 1H2022.
- The median price for 1 Terabyte (1000 gigabytes) of 5G wireless broadband data in EU has fallen below 5 EUR.



¹http://research.rewheel.fi/downloads/Root_cause_weak_competition_Canada_wireless_market_PUBLIC.pdf

Please note that Rewheel research subscribers that purchase the 4G and 5G tariff database (Excel spreadsheet) could automatically create charts/tables for any price metric detailed above for smartphone, mobile broadband, and wireless broadband plans. Subscribers could freely choose to include in the charts 4G plans only, 5G plans only, 4G&5G plans, the operator main brands only, the operator sub-brands only, the MVNOs only or all brands. Subscribers could determine freely the peak speed tier (e.g., 1, 5, 10, 25, 50, 100, 200, 300, 500, 1000 Mbit/s) rule, the minimum gigabyte basket rule (e.g., 1, 5, 10, 50, 100, 500, 1000 or unlimited gigabytes) or the maximum monthly EUR basket rule (e.g., 5, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100 EUR).

MAX gigabytes 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90 or 100 EUR bought - 1H2022																	
4G&5G smartphone plans with at least 1000 minutes and 10 Mbit/s peak speed																	
EU	OECD	Country code	Country name	5 EUR	10 EUR	15 EUR	20 EUR	25 EUR	30 EUR	40 EUR	50 EUR	60 EUR	70 EUR	80 EUR	90 EUR	100 EUR	
Yes	Yes	AT	Austria	0					∞								
No	Yes	AU	Australia	0					80								
Yes	Yes	BE	Belgium	0					30								
Yes	No	BG	Bulgaria	0					3000								
No	No	BR	Brazil	8					500								
No	Yes	CA	Canada	0					9								
No	Yes	CH	Switzerland	0					∞								
No	Yes	CL	Chile	0					500								
No	No	CN	China	0					60								
No	Yes	CO	Colombia	14					∞								
Yes	No	CY	Cyprus	0					∞								
Yes	Yes	CZ	Czechia	0					10								
Yes	Yes	DE	Germany	2					50								
Yes	Yes	DK	Denmark	0					2000								
Yes	Yes	EE	Estonia	0					∞								
Yes	Yes	EL	Greece	0					20								
Yes	Yes	ES	Spain	0					∞								
Yes	Yes	FI	Finland	0					∞								
Yes	Yes	FR	France	20					210								
Yes	No	HR	Croatia	0					∞								
Yes	Yes	HU	Hungary	0					∞								
Yes	Yes	IE	Ireland	0					∞								
No	Yes	IL	Israel	0					1500								
No	No	IN	India	75					∞								
No	Yes	IS	Iceland	0					100								
Yes	Yes	IT	Italy	30					∞								
No	Yes	JP	Japan	0					∞								
No	Yes	KR	Korea	0					100								
No	No	KW	Kuwait	0					30								
Yes	No	LT	Lithuania	0					∞								
Yes	Yes	LU	Luxemburg	0					15								
Yes	Yes	LV	Latvia	0					∞								
Yes	No	MT	Malta	0					5								
No	Yes	MX	Mexico	5					50								
No	No	MY	Malaysia	6					∞								
Yes	Yes	NL	Netherlands	1					∞								
No	Yes	NO	Norway	0					16								
No	Yes	NZ	New Zealand	0					15								
Yes	Yes	PL	Poland	20					∞								
Yes	Yes	PT	Portugal	0					20								
Yes	No	RO	Romania	80					∞								
No	No	RU	Russia	0					60								
No	No	SA	Saudi Arabia	0					40								
Yes	Yes	SE	Sweden	0					600								
Yes	Yes	SI	Slovenia	0					∞								
Yes	Yes	SK	Slovakia	0					300								
No	Yes	TR	Turkey	15					100								
No	Yes	UK	United Kingdom	0					∞								
No	Yes	US	United States	0					35								
No	No	ZA	South Africa	0					5								

Please note that Rewheel research subscribers that purchase the 4G and 5G tariff database (Excel spreadsheet) could automatically create charts/tables for any price metric detailed above for smartphone, mobile broadband, and wireless broadband plans. Subscribers could freely choose to include in the charts 4G plans only, 5G plans only, 4G&5G plans, the operator main brands only, the operator sub-brands only, the MVNOs only or all brands. Subscribers could determine freely the peak speed tier (e.g., 1, 5, 10, 25, 50, 100, 200, 300, 500, 1000 Mbit/s) rule, the minimum gigabyte basket rule (e.g., 1, 5, 10, 50, 100, 500, 1000 or unlimited gigabytes) or the maximum monthly EUR basket rule (e.g., 5, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100 EUR).

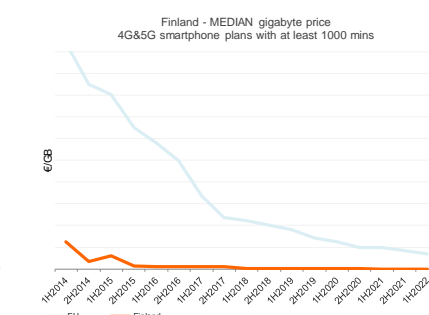
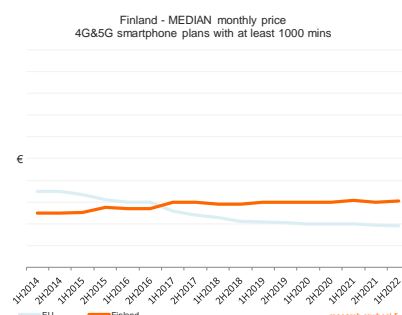
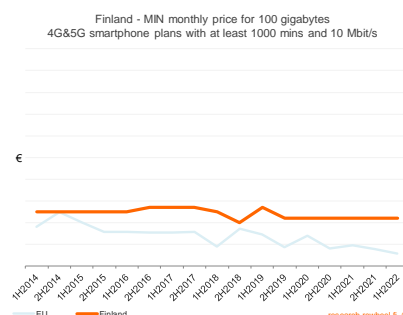
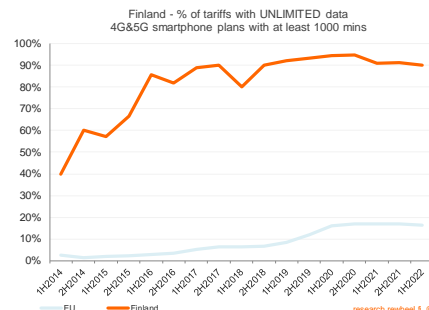
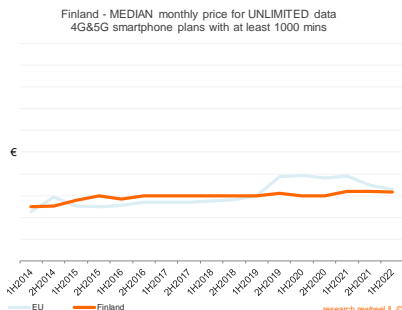
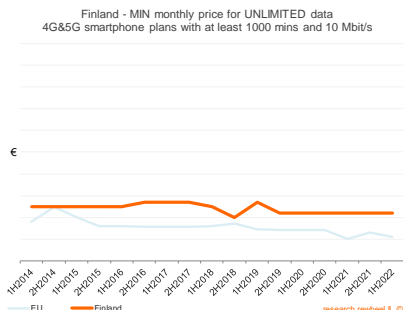
MIN monthly price in EUR for 1, 5, 10, 20, 30, 40, 50, 80, 100, 200, 300, 500 and 1000 gigabytes - 1H202																
4G&5G smartphone plans with at least 1000 minutes and 10 Mbit/s peak speed																
EU	OECD	Country code	Country name	1 GB	5 GB	10 GB	20 GB	30 GB	40 GB	50 GB	80 GB	100 GB	200 GB	300 GB	500 GB	1000 GB
Yes	Yes	AT	Austria									25.00				
No	Yes	AU	Australia									37.40				
Yes	Yes	BE	Belgium													
Yes	No	BG	Bulgaria									18.35				
No	No	BR	Brazil									19.98				
No	Yes	CA	Canada									127.75				
No	Yes	CH	Switzerland									9.75				
No	Yes	CL	Chile									9.89				
No	No	CN	China									44.85				
No	Yes	CO	Colombia									11.50				
Yes	No	CY	Cyprus									25.00				
Yes	Yes	CZ	Czechia									32.76				
Yes	Yes	DE	Germany									39.99				
Yes	Yes	DK	Denmark									16.77				
Yes	Yes	EE	Estonia									11.99				
Yes	Yes	EL	Greece									34.78				
Yes	Yes	ES	Spain									19.95				
Yes	Yes	FI	Finland									22.00				
Yes	Yes	FR	France									8.99				
Yes	No	HR	Croatia									21.97				
Yes	Yes	HU	Hungary									26.97				
Yes	Yes	IE	Ireland									10.00				
No	Yes	IL	Israel									7.25				
No	No	IN	India									7.19				
No	Yes	IS	Iceland									23.36				
Yes	Yes	IT	Italy									7.95				
No	Yes	JP	Japan									23.93				
No	Yes	KR	Korea									21.60				
No	No	KW	Kuwait									42.42				
Yes	No	LT	Lithuania									14.99				
Yes	Yes	LU	Luxemburg									39.99				
Yes	Yes	LV	Latvia									22.99				
Yes	No	MT	Malta									32.99				
No	Yes	MX	Mexico													
No	No	MY	Malaysia									10.78				
Yes	Yes	NL	Netherlands									25.00				
No	Yes	NO	Norway									32.78				
No	Yes	NZ	New Zealand									56.70				
Yes	Yes	PL	Poland									13.20				
Yes	Yes	PT	Portugal									39.28				
Yes	No	RO	Romania									5.80				
No	No	RU	Russia													
No	No	SA	Saudi Arabia									51.61				
Yes	Yes	SE	Sweden									24.80				
Yes	Yes	SI	Slovenia									9.99				
Yes	Yes	SK	Slovakia									22.00				
No	Yes	TR	Turkey									29.14				
No	Yes	UK	United Kingdom									16.80				
No	Yes	US	United States									66.50				
No	No	ZA	South Africa									75.46				

Historic (2014-2021) development of 4G and 5G prices – Finland

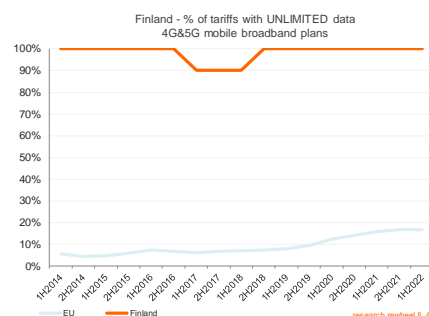
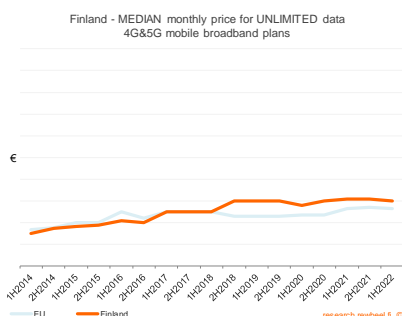
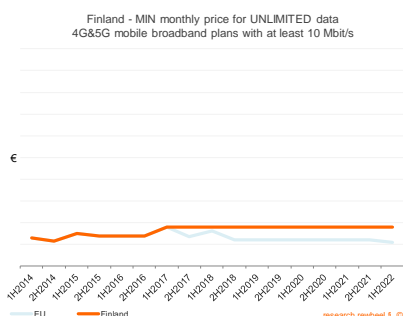
The charts below depict the historic development (2014-2022) of 4G&5G smartphone, mobile broadband and wireless broadband prices in Finland. The PRO full version of the report contains the same set of charts for 50 European, American, Asia Pacific, Middle East and African countries: Austria, Australia, Belgium, Bulgaria, Brazil, Canada, Switzerland, Chile, China, Colombia, Cyprus, Czechia, Germany, Denmark, Estonia, Greece, Spain, Finland, France, Croatia, Hungary, Ireland, Israel, India, Iceland, Italy, Japan, Korea, Kuwait, Lithuania, Luxembourg, Latvia, Malta, Malaysia, Mexico, Netherlands, Norway, New Zealand, Poland, Portugal, Romania, Russia, Saudi Arabia, Sweden, Slovenia, Slovakia, Turkey, United Kingdom, United States and South Africa.

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4G&5G smartphone plans



4G&5G mobile broadband plans



4G&5G wireless broadband plans

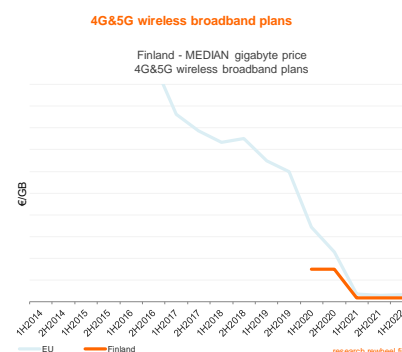
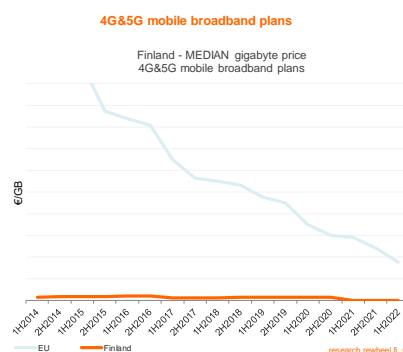
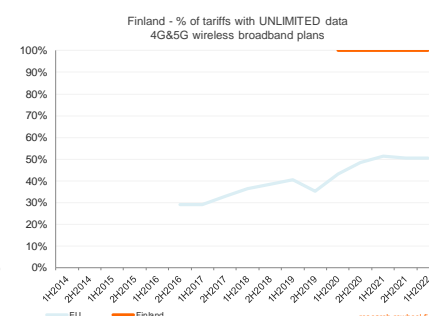
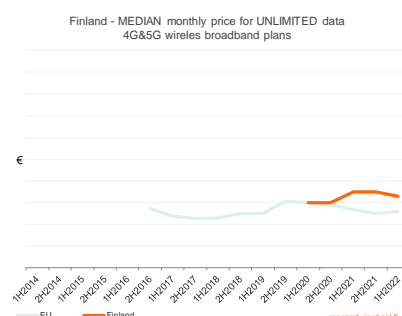
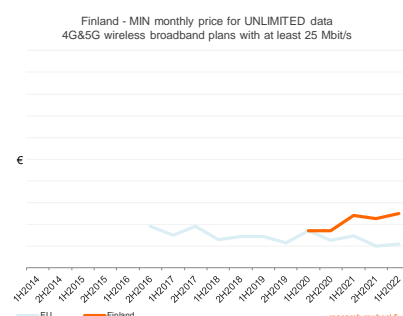


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About Rewheel

Mobile data pricing, mobile operator competitiveness rankings, market modelling & analysis, competition analysis (consolidation, 4 to 3 mobile mergers, effective remedies, new market entries), MNO near-zero marginal data cost, MVNO economics, mobile capacity-only play, mobile centric convergence (MCC) pro-competitive strategies and 4th MNO business case.

Founded in 2009 and incorporated in Finland, Rewheel is a privately owned independent telecom research firm and boutique management consultancy. Our clients are mobile network operators, telco groups, MVNO groups, competition authorities, telecom sector regulators, governments, global internet firms, mobile data-centric start-ups, PE and VC investors.

Rewheel has delivered management consultancy work for clients in the United Kingdom, United States, Germany, Ireland, Switzerland, Finland, Sweden, Belgium, Greece, Poland, Slovenia, Hungary, Russia, Romania.

The following authorities have acquired access to Rewheel's independent pricing, mobile market competitiveness, 4 to 3 merger analysis and remedy assessment research: The European Commission Directorate for Competition, the United States Department of Justice, the New York, California and many other US State Attorney General Offices, the national competition authorities of Canada, Australia, the Netherlands and Greece, the Ministry of Economic Affairs of the Netherlands, the Ministry of Industry and Trade of Czechia, the Korean Electronics and Telecommunication Research Institute, the sector regulators of the United Kingdom, Germany, France, the Netherlands, Ireland, Finland, Portugal, etc.

Rewheel's mobile data pricing, strategy, competition analysis, merger assessment, network economics, spectrum, profitability and competitiveness focused reports have been cited by OECD Economic Surveys, The Economist, The Financial Times, The New York Times, Reuters, Bloomberg, WSJ and publicly referenced by the UK telecoms regulator Ofcom, BIPT, Vodafone, Telefonica, Tele2, Elisa, DNA, GSMA, VPs of the EU Commission responsible for Competition, MEPs, IEEE, ITU.

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1 Methodology

1.1 50 countries included in the comparison

Rewheel's Digital Fuel Monitor bi-annual releases have been tracking 4G and 5G prices in 41 EU & OECD countries since the first half of 2014. In 2020 we added to the list of 41 EU & OECD countries Brazil, China, Colombia, India, Russia, and South Africa. In the 1H2021 release we added Kuwait, Malaysia, and Saudi Arabia bringing the total to 50 countries. The 50 countries that are now tracked have a combined population of ~4.8 billion (more than 60% of the world's population).

In this 17th release we tracked and analysed the state of 4G and 5G pricing during the first half of 2022 (April 2022 prices).

1.2 17th release 2H2021 detailed methodology

Rewheel's methodology was designed from the onset to measure the price of mobile data connectivity both in smartphone plans that include voice and data connectivity and as well in mobile/wireless broadband (data-only plans). Hence, by tracking the price of smartphone plans that include practically unlimited voice connectivity (i.e., 1000 or more national minutes) we could compare directly the price for mobile data connectivity and track the historic price development. Back in 2014² smartphone plans that included practically unlimited minutes/SMS were the de-facto monthly rolling plans in the majority of the EU28 & OECD countries.

By the 1H2022 in almost all of the 50 European, American, Asia Pacific, Middle East and African countries smartphone plans that included practically unlimited national minutes/SMS had become the de-facto monthly rolling plans. In some ultra-competitive European 4-MNO markets such as France and Italy ultra-low (5 to 10 EUR/month) priced plans with unlimited minutes/SMS and 50 to 200 gigabytes are the norm nowadays.

1.2.1 Number of tariffs, mobile network operators (MNOs), operator sub-brands and mobile virtual network operators (MVNOs)

This 17th release 1H2022 contains 1933 smartphone plan tariffs, 666 mobile broadband plan tariffs and 329 wireless broadband plan tariffs. Those were sold by 169 mobile network operators, 90 operator sub-brands and 73 MVNOs that were present in the 50 European, American, Asia Pacific, Middle East and African countries. The entire database includes ~30,000 4G and 5G tariff plans.

1.2.2 Tariff collection and tariff eligibility rules

Tariffs were collected from the operator websites during April 2022. We archived screenshots from every single operator tariff that was used in the comparative analysis and as well downloaded and archived the tariff terms and conditions wherever needed and readily available.

Eligible smartphone plans were 4G LTE or 5G plans with at least 1000 national (to all domestic mobile and fixed networks) minutes and 0.5 Mbit/s peak speed. Eligible mobile broadband plans were 4G LTE or 5G plans with at least 0.5 Mbit/s peak speed. Eligible wireless broadband plans were 4G LTE or 5G plans with at least 0.5 Mbit/s peak speed.

Mobile broadband plans were plans with full mobility (i.e., the data can be used anywhere in the country) while wireless broadband plans were fixed wireless access (FWA) or stationary home broadband plans that may or may not require an external antenna.

4G LTE or 5G plans with speed cap lower than 0.5 Mbit/s were not eligible. 4G LTE or 5G plans where the speed was throttled below 0.5 Mbit/s after the depletion of a high-speed volume were eligible but treated as tariffs with finite data volume. 3G plans, irrespective their speed were not eligible.

Eligible plans were monthly rolling plans (both postpaid and prepaid plans with automatic 28- or 30-day renewal) that were available to all consumers. Plans with lower prices or higher gigabyte allowances offered to selected consumers such as youth, seniors, soldiers, additional family members, consumers that switch from other named operators, existing loyal customers, customers with PayPal accounts, etc. or plans bundled with fixed broadband service, mobile broadband service, TV services were not eligible.

We logged all the SIM-only tariffs and in rare occasions tariffs with handset subsidies that included higher gigabyte volume allowance than the maximum possible that consumers could obtain with SIM-only tariffs. The following parameters have been

²http://research.rewheel.fi/insights/2014_june_ranking/

collected for each tariff: the date and time of collection, the country, the operator name, the brand name of the operator, the brand type (operator main or sub-brand or MVNO), the price in local currency, the included data allowance, the included minute & SMS allowances, the maximum download speed of data if applicable (in cases where no speed was mentioned we logged the network maximum speed offered by the operator), mobility restrictions if applicable (e.g. wireless home broadband plans intended for home usage only) handset subsidies if applicable, tariff name and any applicable options and finally the URL of the operator.

All commercial promotions available at the time of collection were considered (e.g., 2 months free if purchased online or 10% off if purchased before a certain date). All discounts were calculated for a minimum period of 12 months or for the specified contract period if it was longer than 12 months. If a tariff was cheaper with longer contract duration, we logged in the database the lowest available price (e.g., 10% off with a 24-month contract).

The tariff monthly fee does not include one-off fees (activation, porting, service etc). Such fees, with very few exceptions, do not significantly increase the monthly tariff fee for the duration of the contract or when they applied to a 12-month period in monthly rolling tariffs.

The database includes off-the-shelf tariffs (e.g., RED 2 Mbit/s, RED 10 Mbit/s, RED MAX Mbit/s) and as well data volume or speed add-ons that increase the monthly data volume allowance or the maximum speed. Only monthly rolling data volume or speed add-ons were eligible add-ons. One-time use add-ons that expired in the end of the billing cycle were excluded. Promotions that temporarily increased the volume allowance, maximum speed or provided access to 5G were considered only if they were applicable for the entire contract duration or in case of monthly rolling contracts for minimum 12 months.

No Purchase Power Parity (PPP) operation has been performed on the raw tariff plan prices. Prices in EUR are the retail (VAT and other applicable taxes included where available) prices found on the operator web sites. Prices in other national currencies have been converted to EUR by simply using the exchange rate displayed by Google on the day of collection.

Please note that in each release historic prices in countries that do not use EUR as their national currency are converted to EUR using the latest exchange rate (i.e., the exchange rate logged in the latest release). Hence, historic prices may vary from release to release. For example, the USD to EUR exchange rate has fluctuate from 0.74 to 0.95 as seen in the table below. In this 17th release 1H2022 historic US prices (i.e., 2014 to 1H2022 prices) were converted to EUR using a flat 0.95 exchange rate.

EU	OECD	Country code	Country name	Currency	1H2014	2H2014	1H2015	2H2015	1H2016	2H2016	1H2017	2H2017	1H2018	2H2018	1H2019	2H2019	1H2020	2H2020	1H2021	2H2021	1H2022
No	Yes	US	United States	USD	0.7400	0.7900	0.8900	0.9100	0.8900	0.8900	0.9300	0.8500	0.8100	0.8600	0.8900	0.9100	0.9200	0.8600	0.8400	0.8500	0.9500

EU	OECD	Country code	Country name	Currency	1H2022
Yes	Yes	AT	Austria	EUR	1.0000
No	Yes	AU	Australia	AUD	0.6800
Yes	Yes	BE	Belgium	EUR	1.0000
Yes	No	BG	Bulgaria	BGN	0.5100
No	No	BR	Brazil	BRL	0.2000
No	Yes	CA	Canada	CAD	0.7300
No	Yes	CH	Switzerland	CHF	0.9800
No	Yes	CL	Chile	CLP	0.0011
No	No	CN	China	CNY	0.1500
No	Yes	CO	Colombia	COP	0.00024
Yes	No	CY	Cyprus	EUR	1.0000
Yes	Yes	CZ	Czechia	CZK	0.0410
Yes	Yes	DE	Germany	EUR	1.0000
Yes	Yes	DK	Denmark	DKK	0.1300
Yes	Yes	EE	Estonia	EUR	1.0000
Yes	Yes	EL	Greece	EUR	1.0000
Yes	Yes	ES	Spain	EUR	1.0000
Yes	Yes	FI	Finland	EUR	1.0000
Yes	Yes	FR	France	EUR	1.0000
Yes	No	HR	Croatia	HRK	0.1300
Yes	Yes	HU	Hungary	HUF	0.0027
Yes	Yes	IE	Ireland	EUR	1.0000
No	Yes	IL	Israel	ILS	0.2900
No	No	IN	India	INR	0.0120
No	Yes	IS	Iceland	ISK	0.0071
Yes	Yes	IT	Italy	EUR	1.0000
No	Yes	JP	Japan	YEN	0.0073
No	Yes	KR	Korea	WON	0.00075
No	No	KW	Kuwait	KWD	3.0300
Yes	No	LT	Lithuania	EUR	1.0000
Yes	Yes	LU	Luxemburg	EUR	1.0000
Yes	Yes	LV	Latvia	EUR	1.0000
Yes	No	MT	Malta	EUR	1.0000
No	Yes	MX	Mexico	MXN	0.0470
No	No	MY	Malaysia	MYR	0.2200
Yes	Yes	NL	Netherlands	EUR	1.0000
No	Yes	NO	Norway	NOK	0.1100
No	Yes	NZ	New Zealand	NZD	0.6300
Yes	Yes	PL	Poland	PLN	0.2200
Yes	Yes	PT	Portugal	EUR	1.0000
Yes	No	RO	Romania	EUR	1.0000
No	No	RU	Russia	RUB	0.0120
No	No	SA	Saudi Arabia	SAR	0.2500
Yes	Yes	SE	Sweden	SEK	0.0970
Yes	Yes	SI	Slovenia	EUR	1.0000
Yes	Yes	SK	Slovakia	EUR	1.0000
No	Yes	TR	Turkey	TRY	0.0620
No	Yes	UK	United Kingdom	GBP	1.2000
No	Yes	US	United States	USD	0.9500
No	No	ZA	South Africa	ZAR	0.0590

1.2.3 Eligibility rules for plans designated as UNLIMITED data volume plans

UNLIMITED data volume plans were all plans with no specified on-device (i.e., excluding hotspot functionality in smartphone plans) finite gigabyte volume limit for a given peak speed.

Plans where the operators (e.g., Korean, Belgian, and Canadian operators) included high speed for a specified finite gigabyte volume and lower speed (e.g., 0.5 Mbit/s) for an unlimited data volume that kicks-in after the depletion of the high-speed volume were treated as two separated tariffs; a tariff with a finite data volume with high speed and a tariff with an unlimited data volume with lower (i.e., the throttled) speed.

Plans where the operators (e.g., US operators) reserved the right to de-prioritized the traffic and throttled the speed at unspecified rates after a specified finite data volume was depleted (e.g., 50 gigabytes) were treated as a single tariff with a finite data volume with high speeds.

Plans with unlimited data volume where video streamed at a specified lower speed (e.g., US operator standard definition 480p 1.5 Mbit/s) and where the consumers could not easily turn off this feature were logged as tariffs with unlimited data volume at the video specified streaming lower speed (i.e., 1.5 Mbit/s).

While European operators do include WiFi hotspot functionality in smartphone plans at no extra cost for the entire finite or unlimited data volume – obliged by the EU net neutrality rules³ – many non-EU operators (e.g., US or Korean operators) block altogether this functionality in some smartphone plans, include a smaller data volume for tethering than the on-device data volume or charge additional fees for enabling the WiFi hotspot functionality for finite data volumes. Hence, the like-for-like comparison of smartphone plans prices between EU and non-EU operators if WiFi hotspot functionality were to be included would yield higher prices for non-EU operators.

1.2.4 Price and other competitiveness metrics

From the 13th release⁴ 1H2020 onwards we are using the following metrics for analysing the tariffs and ranking the countries included in the comparison.

- a) *MIN monthly price for UNLIMITED data*: lowest monthly retail price (including VAT and other applicable taxes) per country among all unlimited data volume tariffs logged in the database for a given peak speed (e.g., 1 Mbit/s, 5, Mbit/s, 10 Mbit/s, 25 Mbit/s, 50 Mbit/s, 100 Mbit/s for 4G plans and 100, 200, 300, 500 and 1000 Mbit/s for 5G plans).
- b) *MEDIAN monthly price for UNLIMITED data*: median monthly retail price (including VAT and other applicable taxes) per country or group of countries among all unlimited data volume tariffs logged in the database.
- c) *% of plans with UNLIMITED data*: share in percentage of unlimited data volume tariffs per country or group of countries among all tariffs logged in the database.
- d) *MEDIAN monthly price*: median monthly retail price (including VAT and other applicable taxes) per country or group of countries among all tariffs logged in the database.
- e) *MEDIAN gigabyte price*: median gigabyte price (retail monthly price including VAT and other applicable taxes divided by the included gigabyte allowance) per country or group of countries among all tariffs logged in the database.
- f) *MAX gigabytes that 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90 or 100 EUR bought*: highest gigabytes that a given monthly EUR amount bought among all eligible tariffs that were logged in the database and had a peak speed of at least 10Mbit/s.
- g) *MIN monthly price for a given gigabyte volume and a given peak speed (e.g., 100 gigabytes at 10Mbit/s)*: lowest monthly retail price (including VAT and other applicable taxes) per country among all eligible tariffs that were logged in the database that included the given gigabyte volume at the specified peak speed.

³https://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/6160-berec-guidelines-on-the-implementation-b_0.pdf

⁴http://research.rewheel.fi/downloads/The_state_of_4G_5G_pricing_DFMonitor_13_release_1H2020_PUBLIC.pdf

The *MEDIAN gigabyte price* metric has been calculated by assigning a finite volume to tariffs that included unlimited data volume. In each release we have assigned to tariffs that included unlimited data volume the maximum finite volume sold across all countries that were included in the release.

In this 17th release 1H2022 smartphone, mobile broadband and wireless broadband UNLIMITED data volume plans were assigned a finite volume of 10000 gigabytes (10 terabytes). During the 1H2022 in a number of countries operators sold 4G or 5G smartphone, mobile broadband and wireless broadband plans that included named fixed data volumes of 1000, 2000, 3000, 5000, 6000 and 10000 gigabytes (1, 2, 3, 5, 6 and 10 terabytes). See section 7 for more details.

For smartphone tariffs the maximum finite volume sold was 100 gigabytes in the 1st, 2nd and 3rd releases, 250 gigabytes in the 4th and 5th releases, 300 gigabytes in the 6th, 7th and 8th releases, 1000 gigabytes in the 9th, 10th, 11th, 12th, 13th and 14th releases and 10000 gigabytes in the 15th and 16th releases.

For mobile broadband and wireless broadband tariffs, the maximum finite volume sold was 500 gigabytes in the 1st, 2nd, 3rd, 4th, 5th and 6th releases, 1000 gigabytes in the 7th, 8th, 9th, 10th, 11th, 12th, 13th and 14th releases and 10000 gigabytes in the 15th and 16th releases.

Please note that Rewheel research subscribers that purchase the 4G and 5G tariff database (Excel spreadsheet) could automatically create charts/tables for any price metric detailed above for smartphone, mobile broadband, and wireless broadband plans. Subscribers could freely choose to include in the charts 4G plans only, 5G plans only, 4G&5G plans, the operator main brands only, the operator sub-brands only, the MVNOs only or all brands. Subscribers could determine freely the peak speed (e.g., 1, 5, 10, 25, 50, 100, 500, 1000Mbit/s) rule, the minimum gigabyte basket rule (e.g., 1, 10, 100, 1000 or unlimited gigabytes) or the maximum monthly EUR basket rule (e.g., 5, 10, 20, 30, 40, 50, 100 EUR).

1.2.5 Notes regarding this 17th release 1H2022

The prices of some plans sold by some US and Canadian operators do not include sales and other service taxes (may vary from ~1%-10%). Hence, the like-for-like country rankings of the United States and Canada might be worst than what is shown herein.