The state of 4G and 5G pricing, 2H2021 – country rankings

Prices of 5G smartphone, mobile broadband and wireless broadband plans continue to fall sharply in EU in 2H2021. While the share of plans with UNLIMITED data volume continue to increase the rate of increase slowdown in 2H2021. The median gigabyte price of 4G&5G smartphone plans in the Israeli 4-MNO market fell to 0.04 EUR.

4G and 5G prices from 172 operators in 50 European, American, Asia Pacific, Middle East and African countries.

Rewheel research PRO study, Digital Fuel Monitor 16th release – October 2021

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).
Country Highlights
- Countries with high prices: Canada, South Africa, Greece, Saudi Arabia and Japan.
- Prices in the Canadian wireless market (de-facto network duopoly\(^1\)) continue to be the highest or among the highest in the world in 2H2021. See section 8 for details.
- During September 2021 the MIN monthly price for a 4G&5G smartphone plan with at least 1000 mins, 10 Mbit/s and 100 gigabytes was 13x more expensive in Canada than in France.
- Japan: Following Rakuten’s 4\(^{th}\) MNO launch, prices in Japan fell in 2021, but not fast enough and not across the board.
- Countries with low prices: Russia, Israel, India, Malaysia, France, Italy, Poland, Romania, Colombia, Brazil, Chile.
- 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 100 gigabytes for ~7 EUR per month while 5G smartphone plans with unlimited minutes and 1 Terabyte (1000 gigabytes) cost ~15 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 172 operator main brands, 94 operator sub-brands and 65 major MVNOs.

4G and 5G pricing trends in EU
- The median monthly price of 4G and as well 5G smartphone plans in EU continue to fall in 2H2021.
- The median gigabyte price of 4G smartphone plans in EU continue to fall in 2H2021.
- The median gigabyte price of 5G smartphone plans in EU fell in 2H2021.
- The median gigabyte price of 5G smartphone plans in EU was 5x lower in 2H2021 than the median gigabyte price of 4G plans.
- Prices for 1 Terabyte (1000 gigabytes) of 5G wireless broadband data in EU fell below 10 EUR in 2021.

\(^1\)http://research.rewheel.fi/downloads/Root_cause_weak_competition_Canada_wireless_market_PUBLIC.pdf
The table with all values is available in the PRO full version of the report.

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The state of 4G and 5G pricing, 2H2021 – country rankings

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

The charts below depict the historic development (2014-2021) 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, Luxemburg, 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.

4G&5G smartphone plans

4G&5G mobile broadband plans

4G&5G wireless broadband plans
The state of 4G and 5G pricing, 2H2021 – country rankings

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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, 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.

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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 16th release we tracked and analysed the state of 4G and 5G pricing during the second half of 2021 (September 2021 prices).

1.2 16th 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 2014 smartphone plans that included practically unlimited minutes/SMS were the de-facto monthly rolling plans in the majority of the EU28 & OECD countries.

By 2021 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 16th release 2H2021 contains 1888 smartphone plan tariffs, 683 mobile broadband plan tariffs and 310 wireless broadband plan tariffs. Those were sold by 172 mobile network operators, 94 operator sub-brands and 65 MVNOs that were present in the 50 European, American, Asia Pacific, Middle East and African countries. The entire database includes ~27,000 4G and 5G tariff plans.

1.2.2 Tariff collection and tariff eligibility rules

Tariffs were collected from the operator websites during late August and September 2021. 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 will 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

http://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 0.93 as seen in the table below. In this 16th release 2H2021 historic US prices (i.e., 2014 to 2021 prices) were converted to EUR using a flat 0.85 exchange rate.
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 were 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 were 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 were 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 rules—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 release 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.


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 16th release 2H2021 smartphone, mobile broadband and wireless broadband UNLIMITED data volume plans were assigned a finite volume of 10000 gigabytes (10 terabytes). During the 2H2021 in a number of countries operators sold 4G or 5G smartphone, mobile broadband and wireless broadband plans that included named fined data volumes of 1000, 2000, 3000, 6000 and 10000 gigabytes (1, 2, 3, 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 release.

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 release.

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, or all brands. Subscribers could determine freely the peak speed (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, 100 EUR).

### Notes regarding this 16th release 2H2021

In this 16th release 2H2021 we have omitted Taiwan from the list of tracked countries. Taiwan was included for the first time in the 15th release 1H2021. While most 4G and 5G smartphone plans sold by Taiwanese operators are speed-tiered plans that included unlimited data volume, very few (mostly high-end priced) plans pack unlimited (i.e., 1000 or more) national voice minutes. That makes the comparison of Taiwanese smartphone plans with smartphone plans sold in the other 50 countries less straightforward.

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 that what is shown herein.