

The state of 4G pricing – 1st half 2016 DFMonitor 5th release

Digital Fuel Monitor comprehensively tracks and analyses competitiveness of 4G mobile internet access – prices, usage caps, adoption, consumption – in EU and OECD countries. 41 countries, 139 network operators (belonging to 71 groups), 187 brands, 50 MVNOs, 1,541 tariff plans. While by the first quarter of 2016 4G LTE coverage has grown and user experience improved to broadly similar level¹ across developed countries, huge 4G price, usage cap and usage growth disparities continue to exist as shown by Digital Fuel Monitor's 5th release that tracked April 2016 prices and other competitiveness metrics in EU28 and OECD markets. Special focus in this release: price impact of zero-rating video.

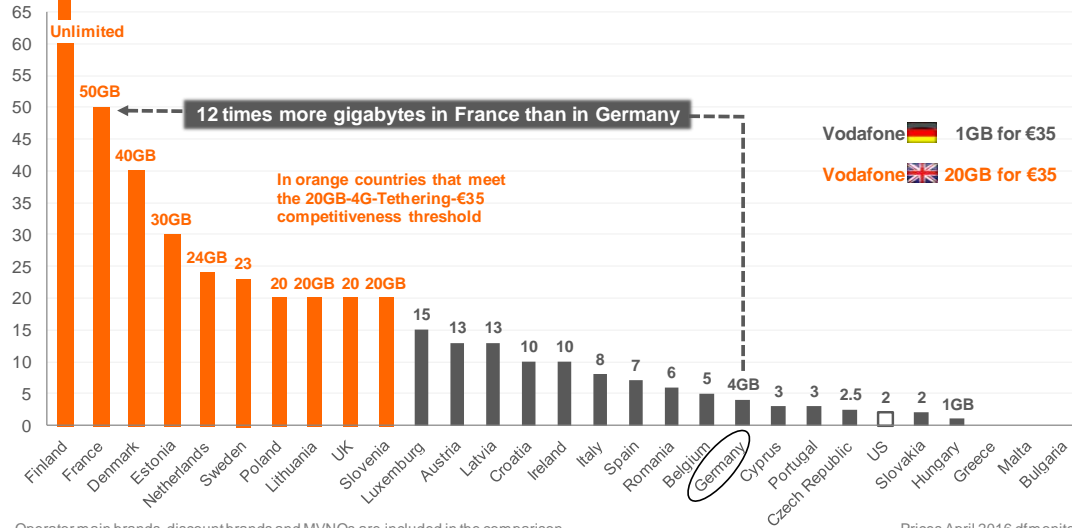
Key findings

- Operators in 4-MNO markets in EU28 sell 3 times more 4G gigabyte volume allowance for €35 than operators in 3-MNO markets
- Mobile data challenger operators ("disruptors") that belong to mobile-only or mobile-centric groups sell 8 times more 4G gigabyte volume allowance for €35 than EU28 operators that belong to groups that have fixed-line broadband interests
- Mobile operators that zero-rate selected video streaming services in EU28 markets sell half as much 4G open internet access gigabyte volume allowance for €35 than mobile operators that do not
- Average mobile data consumption reached 10 gigabytes per person per month in Finland in 2015. In Germany it was nearly 20 times lower

Main market developments

How many 4G LTE smartphone gigabytes €35 buys in EU28 & US

4G LTE SIM-only unlimited (>1,000) minute & SMS smartphone plan per country that for €35 or less includes the most gigabytes and **tethering/hotspot** for the entire volume

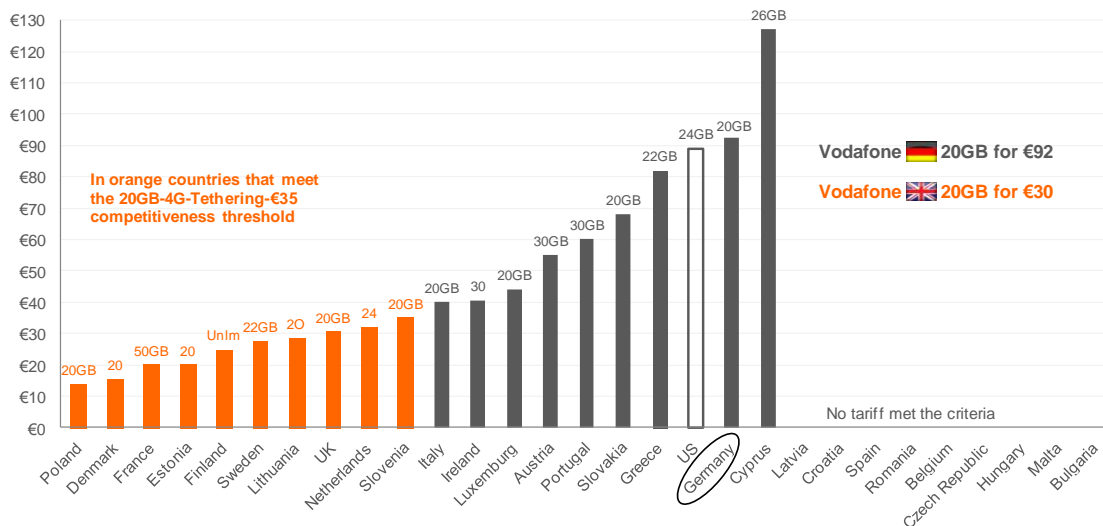


Operator main brands, discount brands and MVNOs are included in the comparison

Prices April 2016 dfmonitor.eu

Lowest price of 20 gigabyte 4G LTE smartphone plan in EU28 & US

Lowest price 4G LTE SIM-only unlimited (>1,000) minute & SMS smartphone plan per country with at least 20 gigabytes and **tethering/hotspot** functionality included for the entire volume



Operator main brands, discount brands and MVNOs are included in the comparison

Prices April 2016 dfmonitor.eu

¹ <http://opensignal.com/reports/2016/02/state-of-lte-q4-2015/>

Premium DFMonitor subscribers, when logged in, can view the €35 and 20 gigabyte charts shown above and many other EUR or gigabyte basket charts with and without including the tethering/hotspot functionality rule. Non-subscribers can freely explore the charts corresponding to the 1H2014 prices.

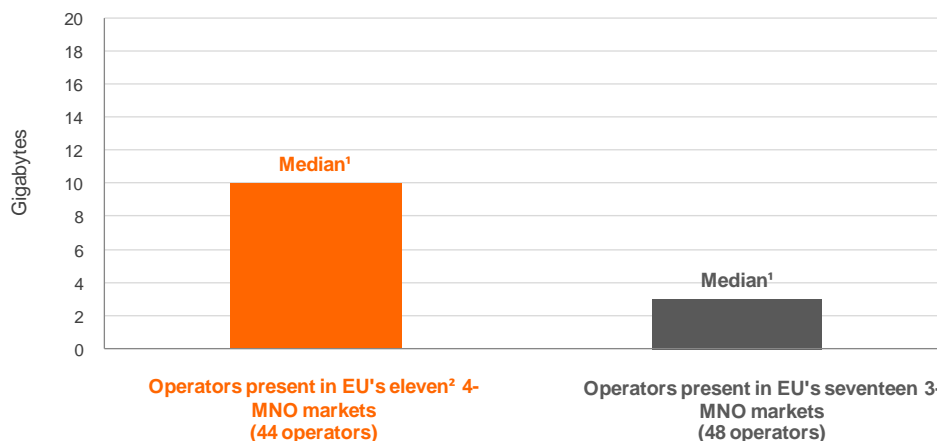
- **Netherlands: What a difference a 4th mobile network operator makes.** Tele2 launched commercial service on its 4G LTE only network in the Netherlands in November 2015. Few months later prices have dropped sharply and gigabyte volume allowances have gone up considerably. In the 3-MNO market Dutch consumers could buy 12 gigabytes for €35. Now, with the entry of a 4th mobile network operator €35 buys Dutch consumers double as much gigabytes!
- **UK: No more 4 to 3 consolidation with ineffective MVNO remedies². Hutchison’s acquisition of Telefonica o2 was blocked by the European Commission.** UK mobile operators, widely anticipating the prohibition of the merger, reacted by cutting prices and increasing gigabyte volume allowances. The UK is now meeting the 20GB-4G-Tethering-€35 competitiveness threshold.
- **Germany: In April 2016 German consumers got few more gigabytes when they spend €35 compared to October 2015. However, consumers in Germany continue to get only a fraction of the gigabyte volume consumers could buy in 4-MNO competitive markets like France, Netherlands, Poland and UK.** Although Drillisch, the merger mandated MVNO, has recently increased the gigabytes on its 4G LTE smartphone plans it is still not able to effectively compete, constrained by the unfavourable economics of its wholesale MVNO deal, on the segment that matters the most: affordably priced (€35 or less) 4G LTE smartphone plans with large (20-50 GB or unlimited) volume allowance that include tethering/hotspot functionality for care free video/TV usage.
- **France: After the collapse of the Orange and Bouygues Telecom 4 to 3 mobile merger prices fell and gigabyte volume allowances increased again.** 3 out of 4 mobile network operators in France sell a 4G LTE unlimited minute & SMS smartphone plan that includes at least 20 gigabytes and tethering/hotspot functionality for less than €28.
- **Slovenia: Slovenia is now meeting the 20GB-4G-Tethering-€35 competitiveness threshold.** Slovenia is technically a 4-MNO market but the no.4 operator has not been an effective competitor due financial (bankruptcy) troubles.
- **Latvia: Latvia does not longer meet the 20GB-4G-Tethering-€35 competitiveness threshold.** All three Latvian mobile operators (TeliaSonera, Tele2 and Bite) are now selling smartphone plans with unlimited minute/SMS/data for €16 to €20 but none allows tethering/hotspot functionality on the unlimited gigabyte volume plans.
- **US: Despite all the noise made by T-Mobile €35 (~\$40) still buys US consumers a tiny 2 gigabyte volume allowance**

Operators in 4-MNO markets in EU28 sell 3 times more 4G gigabyte volume for €35 than operators in 3-MNO markets

In the ‘Tight oligopoly mobile markets in EU28 in 2015’ premium report³ released in January 2016 we showed, using the fourth (2H2015) price data set that the number of mobile operators that are present in a mobile market does affect the price level and size of mobile data volume caps. Prices were significantly lower and gigabyte volume caps were many times higher in markets where 4 rather than 3 mobile network operators were present. Using the latest prices from April 2016 we reconfirmed this finding. In 4-MNO markets such as Denmark, France, Netherlands, Poland, Sweden, UK operators sell (median value) 3 times more gigabyte volume for €35 than operators that are present in 3-MNO markets such as Germany.

In 4-MNO markets operators sell 3 times more gigabyte volume for €35 than in 3-MNO markets

4G LTE SIM-only unlimited (>1,000) minute & SMS smartphone plan per operator that for €35 or less includes the most gigabytes - April 2016



¹Plans with unlimited data volume were assigned a finite volume of 60 GB. 60 GB was the highest finite volume sold for €35 in EU28 in 4G LTE SIM-only unlimited (>1,000) minute & SMS smartphone plans

²Denmark, Spain, France, Italy, Lithuania, Luxemburg, Netherlands, Poland, Romania, Sweden and UK

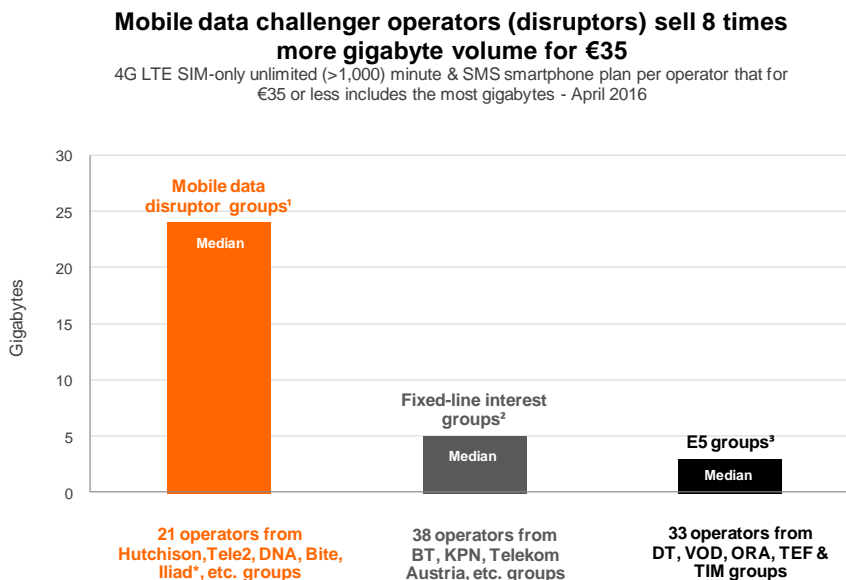
² http://www.dfmonitor.eu/insights/2016_jan_premium_mvno_remedies/

³ http://www.dfmonitor.eu/insights/2016_jan_premium_tightoligopoly_eu28/

Mobile data challenger operators (disruptors) sell 8 times more gigabyte volume for €35 than operators that belong to groups that have fixed-line broadband interest

More importantly in the ‘Tight oligopoly mobile markets in EU28 in 2015’ premium report we also showed that the type of mobile operators that are present (or not) in a mobile market affects the price level and size of mobile data volume caps even more significantly than the number (4 or 3) of mobile operators present.

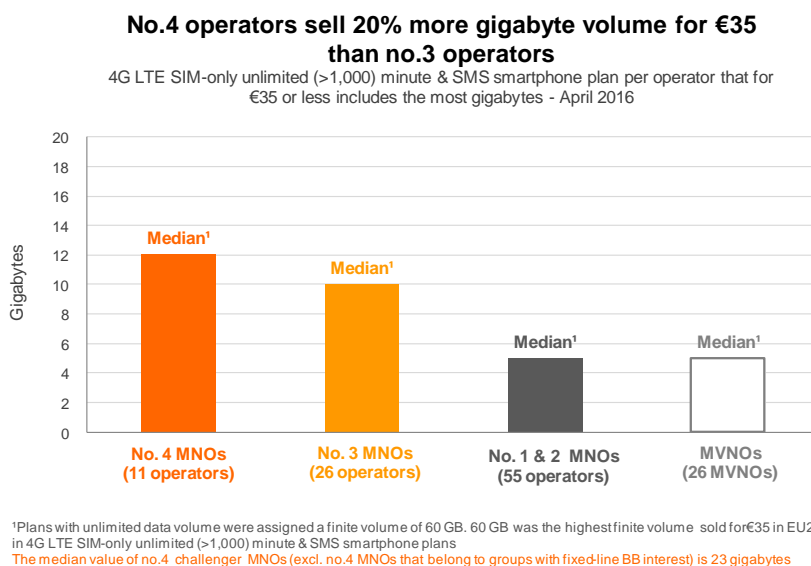
Using the latest prices from April 2016 we reconfirmed this finding. As seen below mobile data challenger operators (disruptors such as Three, Tele2 and Free Mobile) sell 8 times more gigabyte volume for €35 than EU28 operators that belong to groups that have fixed-line broadband interest (e.g. Deutsche Telekom, Vodafone, Orange, Telefonica, Telekom Austria, etc.).



¹Mobile-only (Hutchison) and mobile-centric i.e. do not sell fixed BB in most of its markets (Tele2) groups. *Iliad mobile-only in CH
²Fixed-line interest groups are groups that sell fixed-line broadband in most of the markets where they are present as an MNO
³E5 groups: Deutsche Telekom, Vodafone, Orange, Telefonica and Telecom Italia fixed-line interest groups (60% EU marketshare)

In March 2016 Ofcom, the UK telecom regulator, published a report⁴ titled ‘A cross-country econometric analysis of the effect of disruptive firms on mobile pricing’. Ofcom used similar criteria in categorizing certain mobile operators as disruptors and cited Rewheel’s 2012 premium ‘EU27 smartphone tariff competitiveness’ report⁵ where such criteria were first used and findings (prices of challenger operators are much lower) were first reported. Ofcom’s econometric analysis found that prices are between 17.2% and 20.5% lower on average in countries where there is one additional mobile operator AND a disruptive firm is in the market.

As seen below no.4 mobile network operators sell 20% more gigabyte volume for €35 than no.3 operators. MVNOs including merger mandated so called ‘upfront capacity’ MVNOs are not competitive. They sell for €35 very small gigabyte volume allowances like no.1 and no.2 MNOs.



¹Plans with unlimited data volume were assigned a finite volume of 60 GB. 60 GB was the highest finite volume sold for €35 in EU28 in 4G LTE SIM-only unlimited (>1,000) minute & SMS smartphone plans
 The median value of no.4 challenger MNOs (excl. no.4 MNOs that belong to groups with fixed-line BB interest) is 23 gigabytes

⁴ http://stakeholders.ofcom.org.uk/binaries/research/cross-media/disruptive-firms-econometrics/research_document.pdf

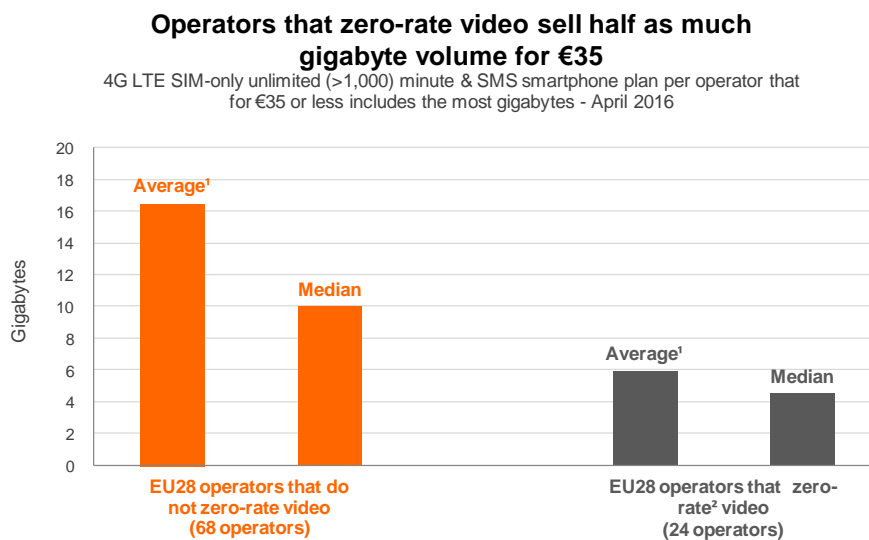
⁵ http://www.dfmonitor.eu/insights/2013_jan_premium_EU27_benchmark/

Mobile operators that zero-rate selected video streaming services sell half as much gigabyte volume for €35 than mobile operators that do not

In the ‘Tight oligopoly mobile markets in EU28 in 2015’ premium report we also presented a theory of competitive and consumer harm caused by price discrimination practices such as zero-rating. Mobile network operators that zero-rate their own or third party video services have an economic incentive (non-coordinated effect) to set restrictive gigabyte volume caps in order to enhance the appeal of their zero-rated services. There are two types of consumer harm that zero-rating may cause: a) Zero-rating can severely restrict⁶ consumer choice. b) Zero-rating can harm consumers because it could lead to higher or excessive mobile internet access prices and restrictive or very restrictive gigabyte volume caps.

In the ‘Tight oligopoly mobile markets in EU28 in 2015’ premium report, using the fourth (2H2015) release price data set we shown that mobile network operators that zero-rate video offer in average for €35 or less nearly 2 times less gigabyte volume including tethering/hotspot functionality compared to mobile network operators that do not.

We have now reconfirmed this finding with the latest prices from April 2016 as seen in the chart below. Mobile operators that zero-rate video in EU28 markets sell half as much gigabyte volume for €35 than mobile operators that do not.



¹Plans with unlimited data volume were assigned a finite volume of 60 GB. 60 GB was the highest finite volume sold for €35 in EU28 in 4G LTE SIM-only unlimited (>1,000) minute & SMS smartphone plans

²Deutsche Telekom (6), Vodafone (4), Orange (3), Hutchison (2), others (9) markets in EU28

24 operators zero-rated their own or third party video content/services during April 2016 in EU28 markets. Deutsche Telekom was the worst offender by zero-rating video in 6 out of the 10 EU28 markets it is present even though Bundesnetzagentur, the German telecom regulator, concluded^{7,8} in 2014 that zero-rating internet services infringes net-neutrality.

Average mobile data consumption reached 10 gigabytes per person per month in Finland in 2015. In Germany it was nearly 20 times lower.

In Finland which is the “most mature data market in the world” according to TeliaSonera’s CEO consumers could buy affordably priced (€20 - €25) truly unlimited open mobile internet 4G LTE smartphone and mobile broadband plans and watch video (e.g. Netflix) on their smartphones or hotspot connected tablets, PCs and TVs without caring about gigabyte consumption. As a result in 2015 in Finland average mobile data consumption reached a staggering 9.7 gigabytes per person per month (yearly average for 2015). Finland is leading the cord cutting and fixed-mobile broadband substitution trend with a mobile broadband penetration of 138.6% as of June 2015. Fixed-line broadband substitution has started to decline in Finland driven by mobile-broadband substitution and as well by substitution of the many fixed-line broadband connections in buildings (one connection per apartment) by one commonly shared high speed fixed-line broadband connection that is purchased by the dwelling association.

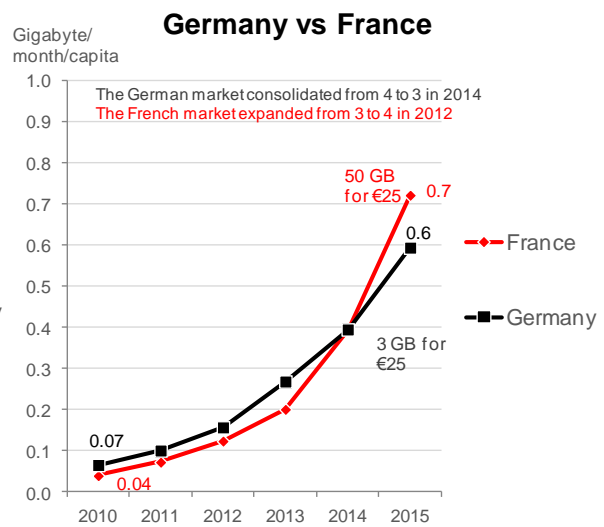
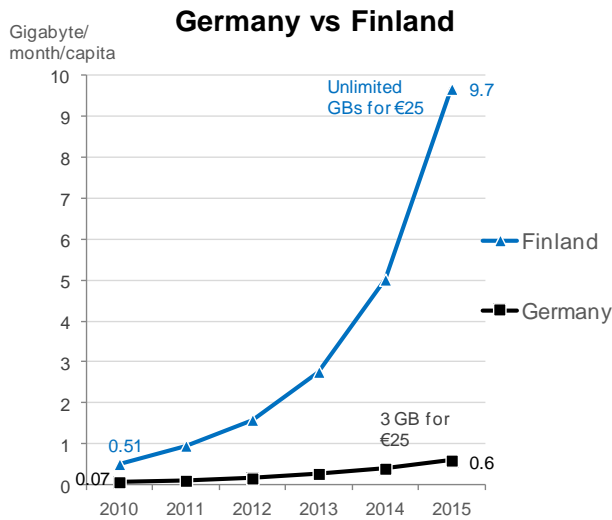
Average mobile data consumption per capita in France, where the mobile market expanded from 3 to 4 mobile network operators, exceeded that of Germany’s where the market consolidated from 4 down to 3 operators during 2014. Moreover, French average mobile data consumption per capita has started to grow much faster during 2015 with a rate that is similar to the Finnish-like exponential growth rate.

⁶ <http://webfoundation.org/2015/02/guest-blog-the-real-threat-to-the-open-internet-is-zero-rated-content/>

⁷ http://www.dfmonitor.eu/insights/2014_sept_premium_germany_zerorating/

⁸ http://www.dfmonitor.eu/insights/2014_sept_premium_fcc_eu_zero-rating/

Monthly mobile data volume consumption per capita



* updated 18.05.2016 based on 2015 actual for Germany reported by Bnetza on 13.05.2016

Monitoring competitiveness from the Finnish perspective

The Digital Fuel Monitor service is managed by the Finnish boutique management consultancy Rewheel that specialises into advising European operators, investors, sector regulators and competition authorities on network economics, competition analysis, merger remedies assessment, mobile internet-centric business models, pricing analysis, spectrum auctions, network sharing and infrastructure investments.

Finland has the lowest mobile internet usage prices among EU28 and OECD countries, the highest mobile data consumption per capita (9.7 gigabytes per person per month in 2015 or 20 times higher than Germany's) and the highest mobile broadband population penetration in June 2015 of 138.6% . All mobile operators in Finland abide by strict net neutrality principles and none of them vertically price discriminate (e.g. zero-rating) any of its own or third party services or content.

Despite the mass-affordable open mobile internet truly unlimited volume offers and very heavy mobile data traffic the Finnish telecom sector generates healthy returns for its investors.