tefficient

Industry analysis #2 2017

Mobile data – full year 2016 and Q1 2017

The luxury of the commodity gigabyte

Revenue per gigabyte can vary between 1 and 48 EUR

This is tefficient's 16th public analysis on the development and drivers of mobile data.

It is an add-on to our just-published analysis "More for more" isn't happening which compares 33 countries.

In this analysis we compare *operators*. We have ranked 111 of them based on:

- **Average data usage per customer**
- **Total data traffic**
- **Revenue per gigabyte**

If you think gigabytes are becoming a commodity, you are just partly right. End-users love what they can do with data – but even if they are willing to pay for it there are limits to their loyalty.

Data usage spans from 0.1 to 10.9 GB per SIM per month

Figure 1 shows the average mobile data usage for 111 reporting or reported[1] mobile operators globally. Both the usage for the full year of 2016 and – if available – the usage for the first quarter of 2017 are displayed.

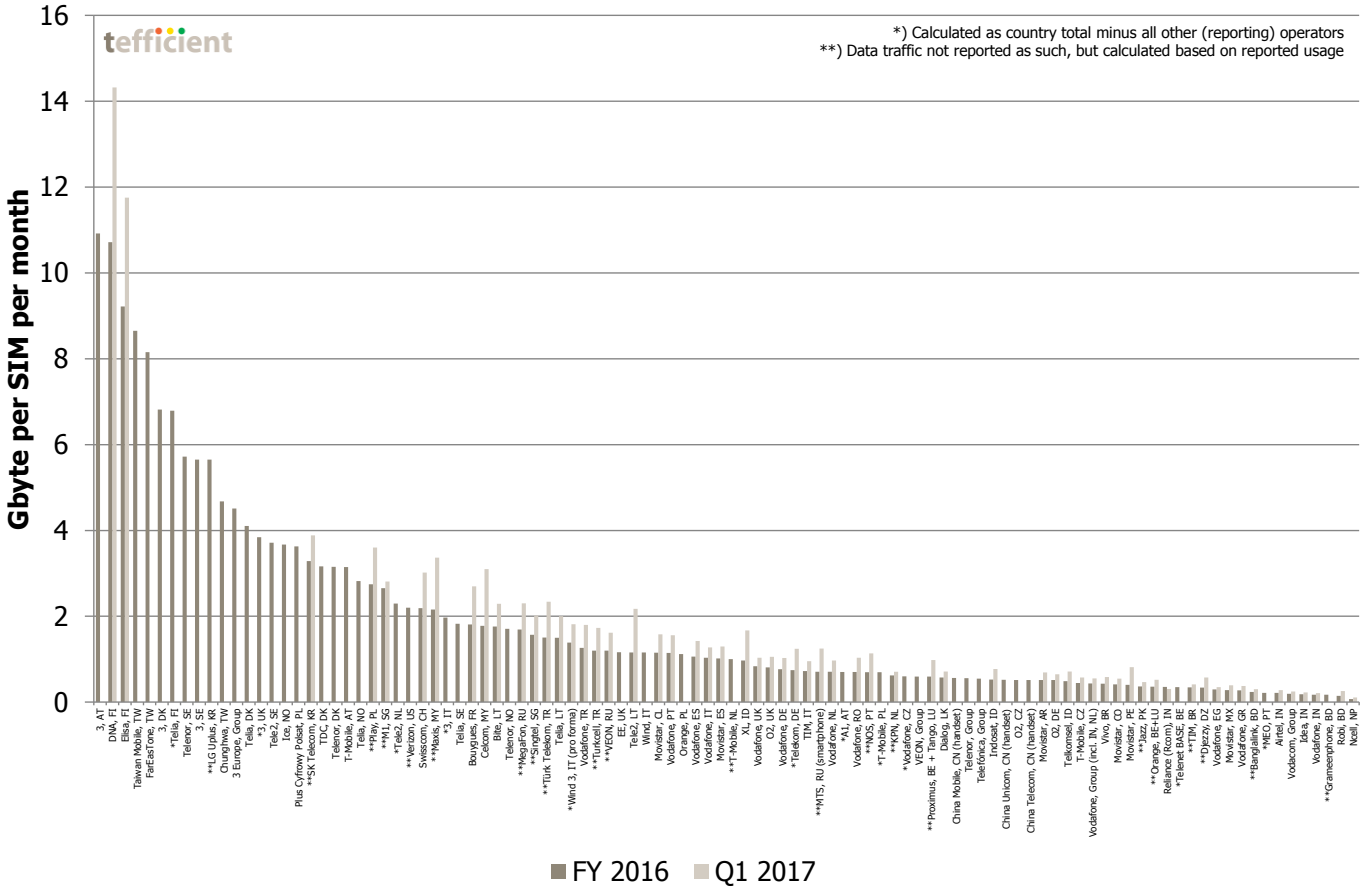

Figure 1. Average data usage per SIM per month – all operators

It's of course near to impossible to read Figure 1 and we will therefore break it down into three regions, but let's first use Figure 1 to identify the **global data usage leaders**.

Gold 3 Austria with 10.9 GB per SIM and month in 2016

Through a number of home broadband plans with unlimited data volume – where price is based on throughput (up to 10, 30, 50 or 150 Mbit/s download) – 3 Austria has managed to build a large base of data-only subscriptions – in most cases replacing slow fixed broadband lines. More than one third of 3's subscriptions were data-only in December 2016. In our country report, we show just how important

[1] By regulators

data-only is for the overall data usage of a country. 3's competitors have followed, today having similar propositions, but 3 still carried a whopping **64%** of the Austrian mobile data traffic in 2016. 3 is not offering unlimited data on smartphone plans, but the buckets are large – and have been large for a long time.

Silver DNA Finland with 10.7 GB per SIM and month in 2016 and 14.3 GB in Q1 2017

The former number 1 has to settle with the silver medal in 2016. But with its quick growth of data usage in the beginning of 2017, DNA could perhaps again challenge 3 Austria for the gold? Since 3 Austria is just reporting every six months, we will have to wait and see. Most of DNA's subscriptions – regular ones as well as data-only subscriptions – have **unlimited data** volume where the price depends on the chosen speed tier. **54%** of the Finnish SIM cards had unlimited data volume in December 2016, but we suspect that DNA is over-indexed in unlimited.

Bronze Elisa Finland with 9.2 GB per SIM and month in 2016 and 11.8 GB in Q1 2017

Elisa is synonymous with **unlimited data** and never stops reminding Finns about it in its marketing – even though DNA too has had it for a long time and Telia today offers it at lower price points than Elisa. Like with DNA, Elisa's price depends on the chosen speed tier. In December 2016, Elisa said that **58%** of voice-also subscriptions had unlimited data volume.

The two Taiwanese operators **Taiwan Mobile** and **FarEasTone** are close to the podium with 8.7 GB and 8.2 GB per month in 2016. As described in the country report, new 4G-focused competition has forced the Taiwanese incumbents to introduce unlimited data volume at very low price points. Even though these offers are now partly rolled back, Taiwan's high mobile data usage is likely here to stay.

Europe: Data usage spans from 0.2 to 10.9 GB per SIM per month

Now to the first of three breakdowns: Europe. The top three operators are the same as in the global comparison: 3 Austria, DNA Finland and Elisa Finland.

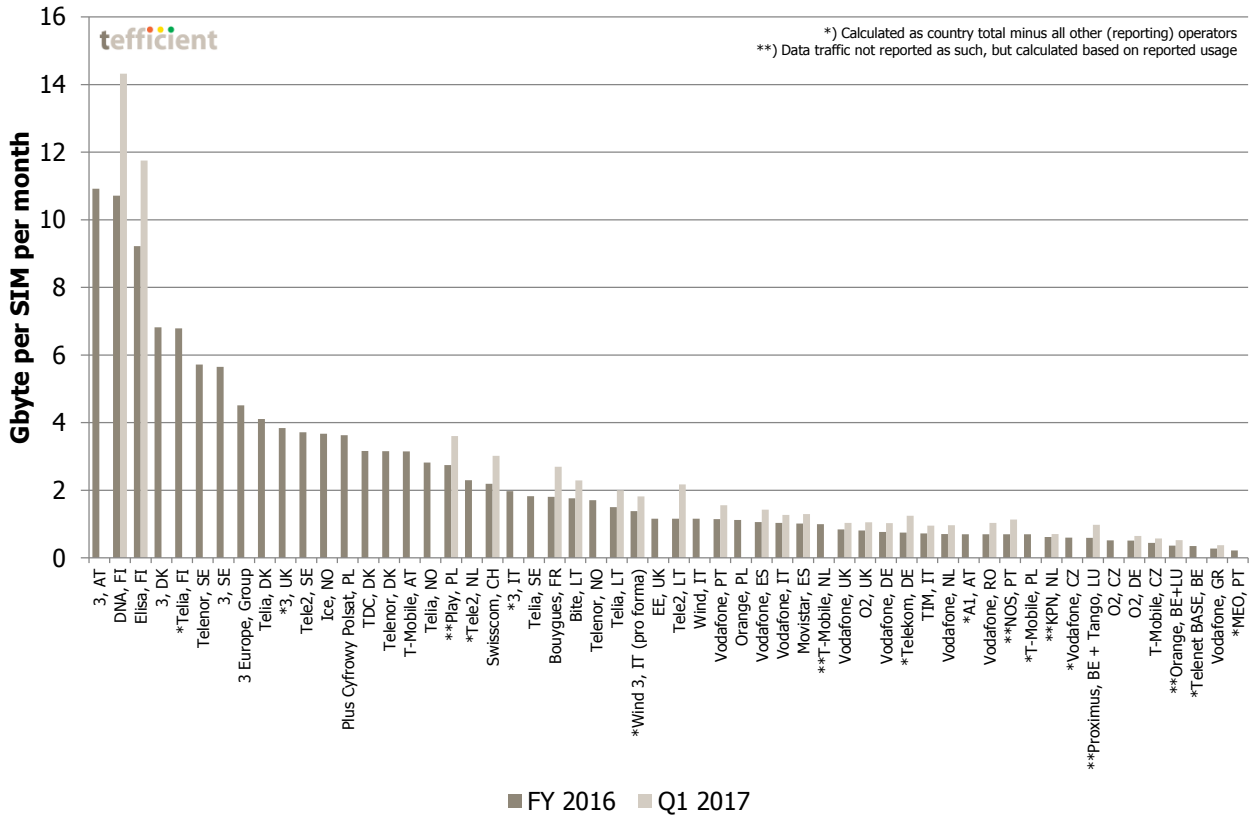

Figure 2. Average data usage per SIM per month – European operators

The remaining European operators have customers with significantly lower usage than the top three, but there are a number of operators that had an average usage above 3 GB per month in 2016. These operators are from the Nordic countries (Finland, Denmark, Sweden, Norway), from Austria, from Poland – and '3' from the UK.

But Europe has a long tail: Operators from five countries – **Portugal**, **Greece**, **Belgium**, **Czech Republic** and **Germany** – hold the ten lowest usage positions.

Asia and China: Data usage spans from 0.1 to 8.6 GB per SIM per month

Taiwanese and Korean operators lead the Asian/Chinese ranking, see Figure 3. We already touched upon Taiwan Mobile and FarEasTone in the global comparison. Their competitor, the fixed line incumbent **Chunghwa**, ranks as number four with 4.7 GB, beaten for third place by the Korean challenger **LG Uplus** whose customers averaged 5.7 GB in 2016.

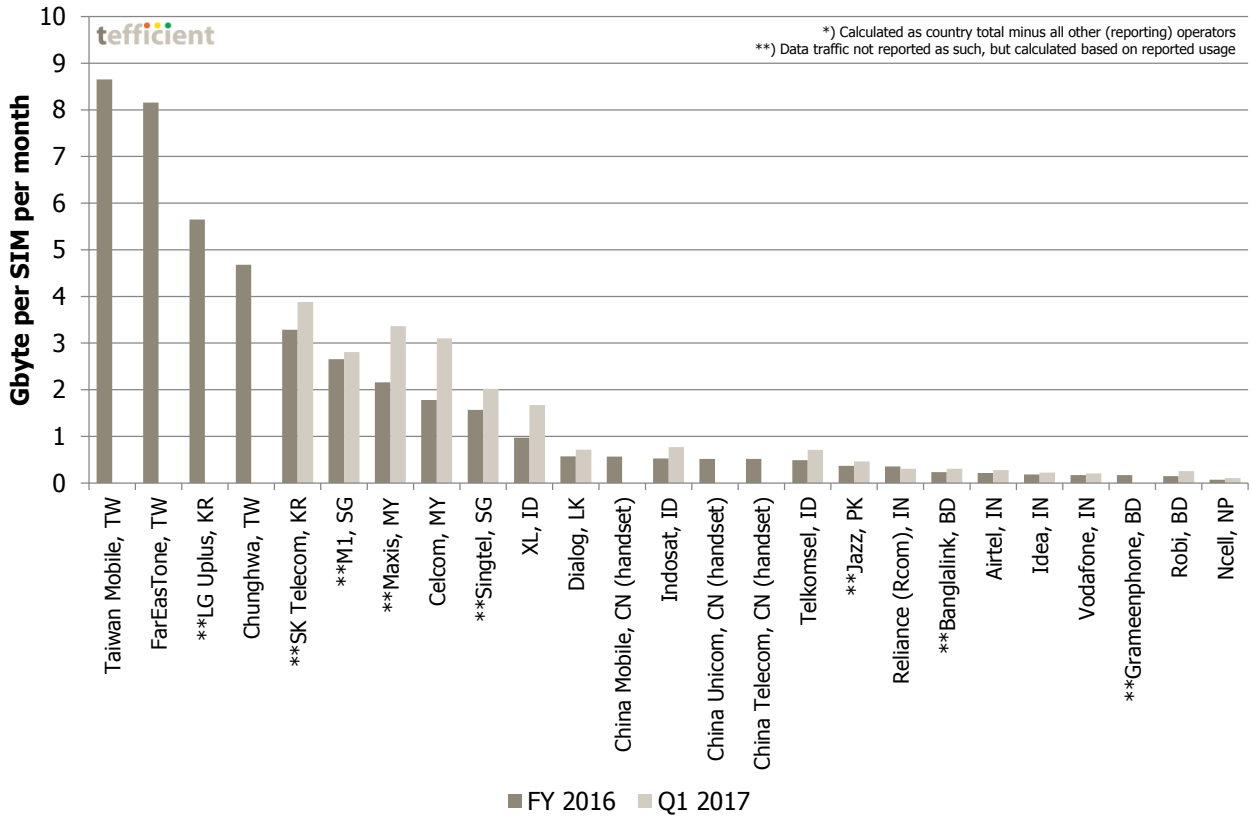

Figure 3. Average data usage per SIM per month – Asian and Chinese operators

SK Telecom is fifth with 3.3 GB, followed by Singapore's **M1** with 2.7 GB. The two Malaysian operators **Maxis** and **Celcom** are trailing – but if you instead look at the Q1 2017 bars, you can see that the two Malaysian operators have experienced fast data usage growth and passed M1 in Q1 2017.

The three Chinese operators **China Mobile**, **China Unicom** and **China Telecom** are mid-ranked with 0.5-0.6 GB per month. Note though that all three exclude data-only from their reported data traffic.

A country with very fast data usage growth is **Indonesia**. Axiata's **XL** is having twice the usage (1.0 GB) of the two larger competitors **Indosat** and **Telkomsel**, but all three operators have had significant growth between 2016 and Q1 2017.

There's been much written about the turmoil in the **Indian** operator market lately, but the average data usage of the reporting Indian operators – Reliance (RCom), Airtel, Idea and Vodafone – is still low: 0.2-0.3 GB per month. The new entrant **Jio** isn't reporting, but the growth reported by TRAI, the regulator, in country traffic could suggest that Jio's average usage is as high as 10 GB, i.e. 50 times higher. It is obvious that Jio's free introductory offer is explaining much of the difference.

RoW: Data usage spans from 0.2 to 2.2 GB per SIM per month

The rest of world ranking combines North American, Latin American and Russian operators with operators from MEA and reporting international groups, see Figure 4.

It is a pity that none of the US or Canadian operators report their data traffic or usage. The only sample in Figure 4 is **Verizon**, based on a smartphone usage number reported as early as April 2016. It's likely that other US carriers, such as T-Mobile and Sprint would have higher data usage – but it is not reported.

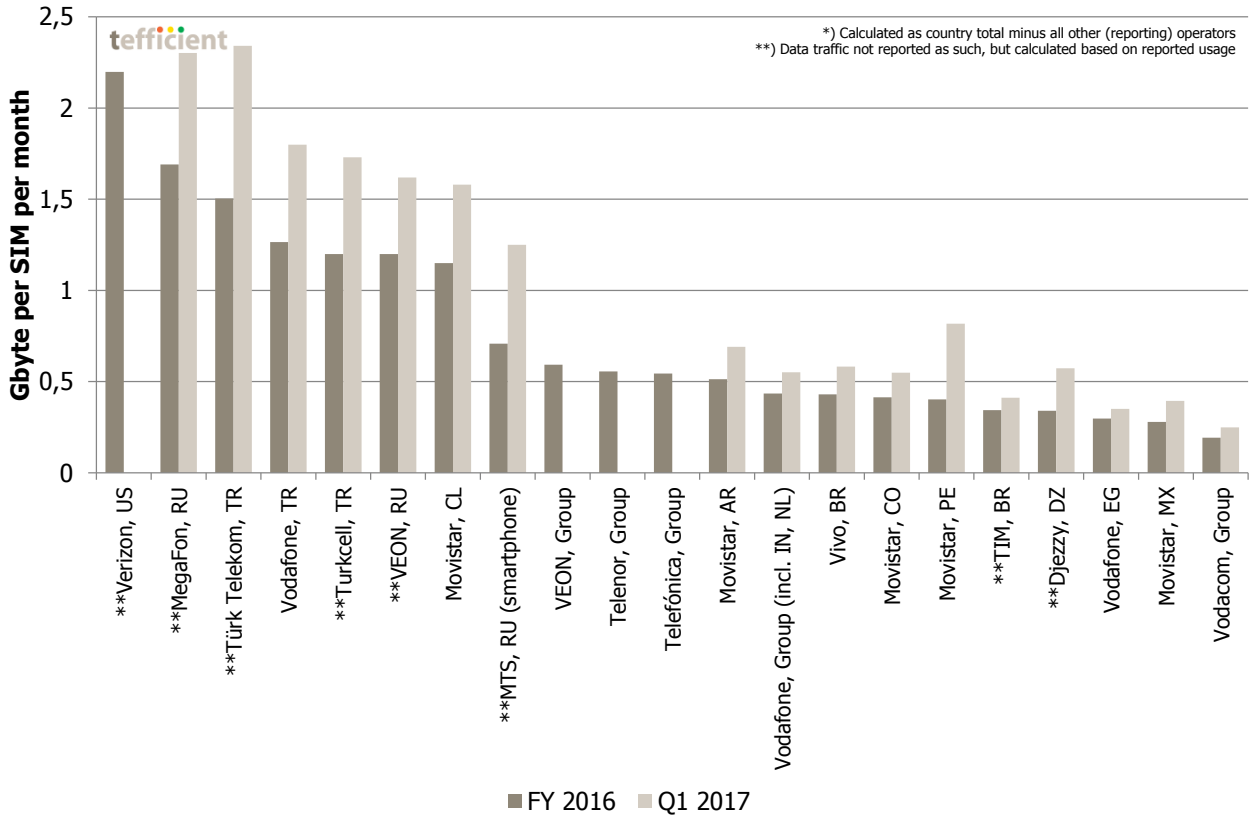

Figure 4. Average data usage per SIM per month – RoW operators

Russian and Turkish operators have high average usage. If we look at the Q1 2017 figures, we can also see that it is growing fast.

The groups – albeit with quite different geography – are mid-ranked with an average usage around 0.5 GB per month. The Latin American operators have – with the exception of Chile – low average usage. **Movistar Peru** has though had good growth so far in 2017.

Last-ranked Vodacom Group is very much dominated by **South Africa** and is our only case of sub-Saharan operators in this analysis.

Data traffic spans from 11 to 5681 PB

We have seen that the data usage varies much between customers of different operators in different countries. If we instead compare total data traffic, the spread will be even wider, see Figure 5.

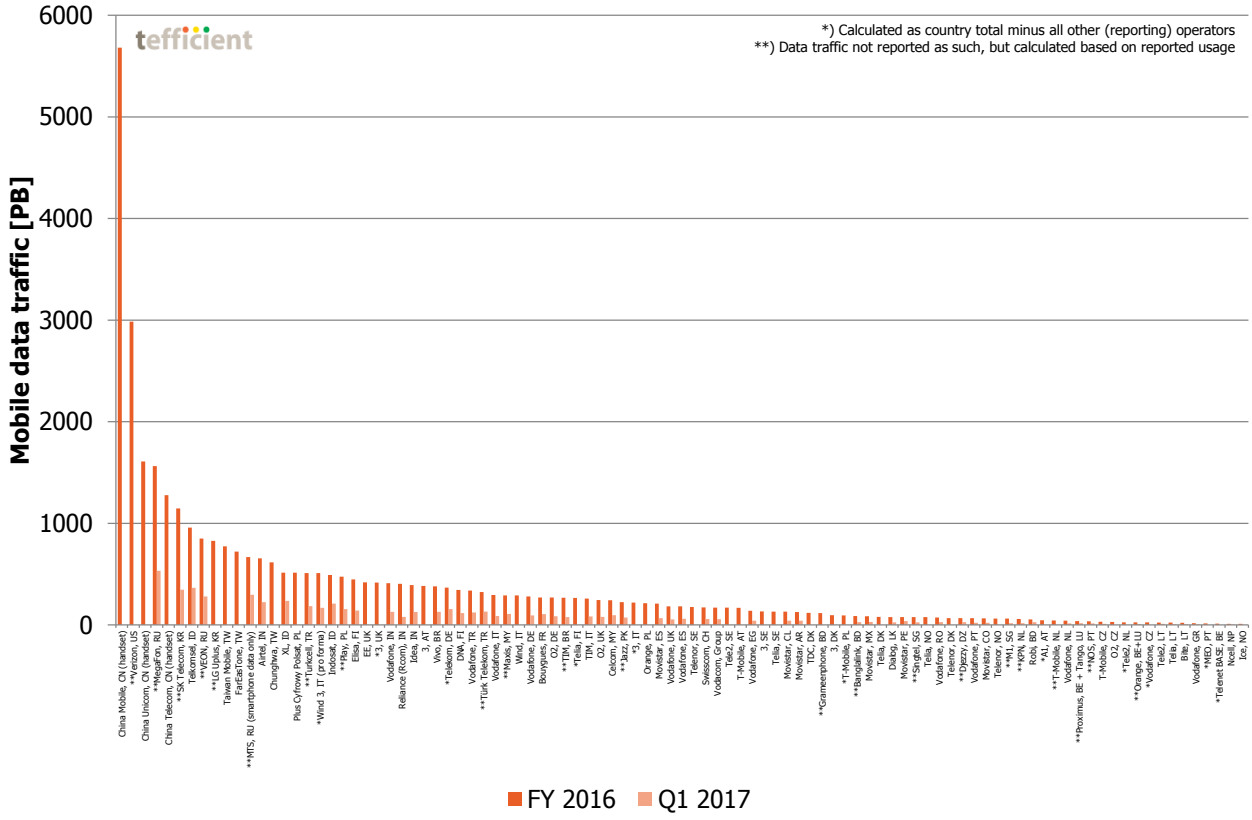

Figure 5. Total data traffic – all operators

Gold China Mobile with 5681 PB in 2016

Even though China Mobile – the operator with the world's largest subscription base (849 million in December 2016) – just includes handset data in its reported mobile data traffic, it is anyhow, by far, the largest traffic volume in the world. Noticeably, China Mobile uses the home-grown Chinese TD-LTE standard for 4G having built 1.5 million such base stations (of a total of 3 million base stations including 2G and 3G).

Silver Verizon USA with 2986 PB in 2016

As said, Verizon doesn't report data traffic and our figure is calculated based on a single smartphone usage indication given in April 2016. The world's largest operator in revenue is anyhow becoming number two in the world in total data traffic.

Bronze China Unicom with 1608 PB in 2016

Like its larger competitor China Mobile, China Unicom is also just reporting handset data. When it comes to 4G, China Unicom (as well as fifth-ranked China Telecom) uses the 'regular' FDD-LTE standard having built 740000 such base stations.

Other operators that are highly ranked are **MegaFon** from Russia, **SK Telecom** from Korea and **Telkomsel** from Indonesia.

Europe: Data traffic spans from 11 to 514 PB

Now to the European breakdown. Since the highest ranked European operator just is number 16 in our global rank, we could conclude that the European countries are less populated than the global leaders. This is only partly true, though: Korea is having a population of 51 million and Taiwan 24 million – less than Europe's largest country Germany's 81 million. Yet Germany is behind Korea and Taiwan in mobile data traffic.

The largest European operator when it comes to mobile data traffic carried in 2016 isn't German either. It is instead **Plus/Cyfrowy Polsat** from Poland, see Figure 6.

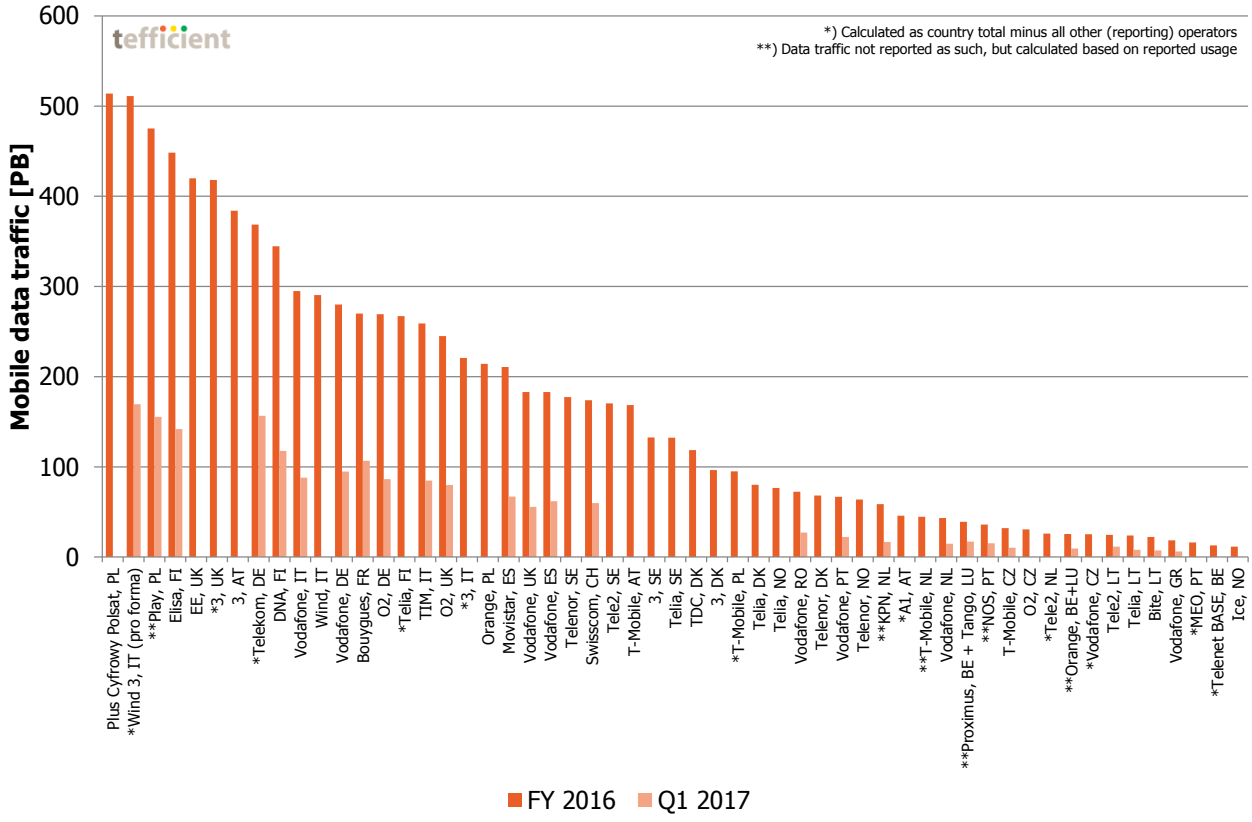

Figure 6. Total data traffic – European operators

Similar to '3' in Austria (that we described in the previous section), Plus/Cyfrowy Polsat has bet much on **data-only** propositions for fixed broadband replacement. Typically these come with 50-100 GB caps, but these do not (currently at least) apply to pure 4G.

Third-ranked **Play** is also Polish and has a similar approach as Plus/Cyfrowy Polsat. The more premium plans are marketed as 'unlimited' but are throttled after a certain (high) cap. This applies to both data-only and smartphone plans.

The second-ranked operator, **Wind 3** from Italy, didn't exist during all of 2016 – the JV was started in November – so this is the pro-forma position of Wind 3. You will find Wind and '3' as stand-alone entities further down in the ranking. It was instead **Vodafone** Italy (ranked 10) that carried the most mobile data of the Italian stand-alone operators in 2016.

Finland is just having 5.5 million inhabitants, but **Elisa** is still ranked as number 4 in Europe having carried more data in 2016 than any operator from Germany (81 Mpop) and from the UK (65 Mpop). Even though there's just one French operator, **Bouygues** (ranked #13), in Figure 6 – simply because the others aren't reporting – the total traffic in France isn't high enough for any of the other French operators (Orange, SFR, Free) to challenge Elisa's position even though there are 67 million inhabitants in France. Elisa's competitors **DNA** and **Telia** are ranked number 9 and 15 respectively.

Europe's largest operator in number of SIMs – **O2 Germany** – is ranked as low as number 14.

Asia and China: Data traffic spans from 12 to 5681 PB

It should come as no surprise to anybody that the three largest carriers in Asia/China are the three Chinese operators **China Mobile**, **China Unicom** and **China Telecom**. As there is no significant difference in data usage per subscription between the three, their ranking follows the subscription market share.

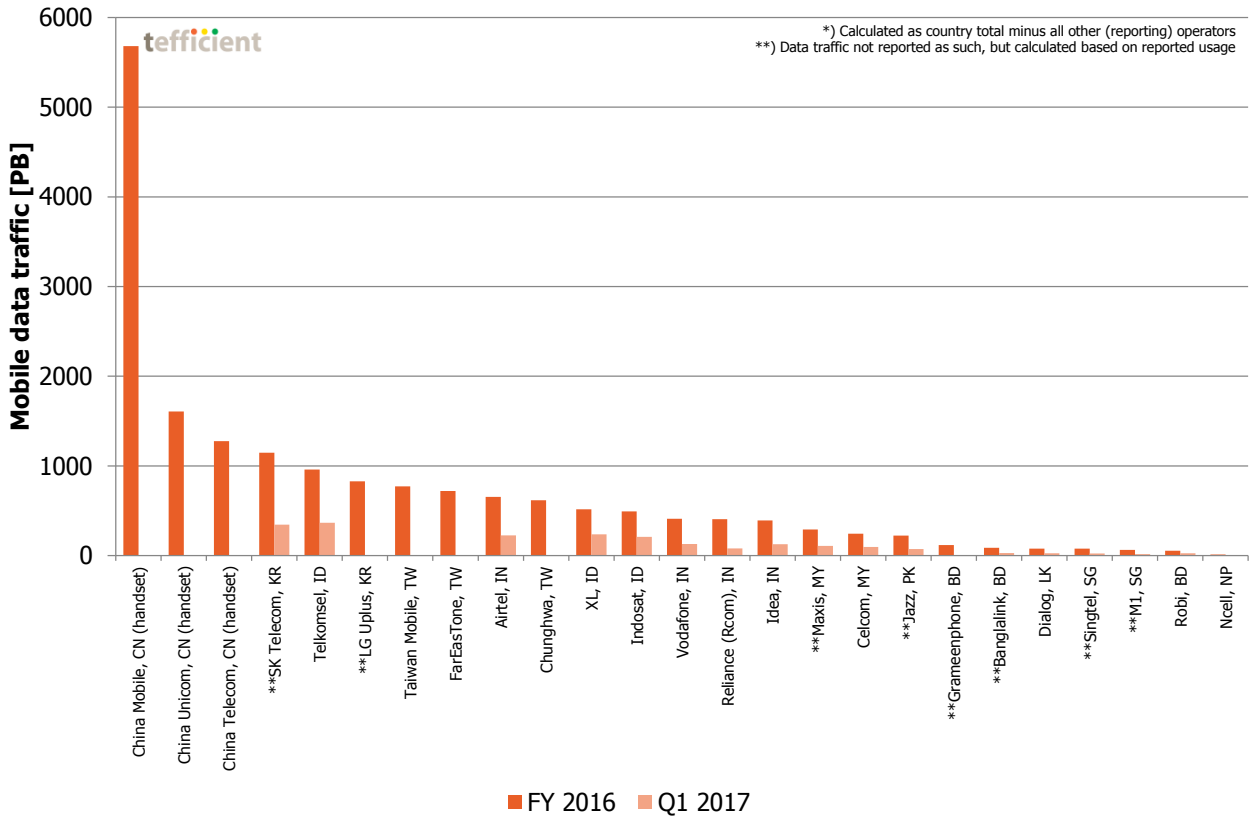

Figure 7. Total data traffic – Asian and Chinese operators

The Korean market leader, **SK Telecom**, follows as number 4. The Korean challenger **LG Uplus** is number 6 due to a lower subscription base; Uplus' usage per SIM is actually higher.

Telkomsel from Indonesia – with 170 million subscribers – is number 5 and the three largest Taiwanese operators Taiwan Mobile, FarEasTone and Chunghwa rank 7, 8 and 10.

The largest reporting Indian operator, **Airtel**, ranks as number 9 even though Airtel has about 270 million subscriptions. The newcomer **Jio** isn't reporting its traffic but hasn't anyhow been in operation the whole of 2016 (operations commenced in September). It is very likely that Jio currently has a higher total traffic than Airtel even though the subscriber count "just" is 100 million. Have in mind, though, that many of these subscribers have been attracted by Jio's free launch proposition. **Vodafone India** (#13) and **Idea** (#15) are in the process of merging and their combined data traffic would be larger than Airtel's.

RoW: Data traffic spans from 66 to 2986 PB

Figure 8 collects operators from the rest of the world, but also a few reporting international groups.

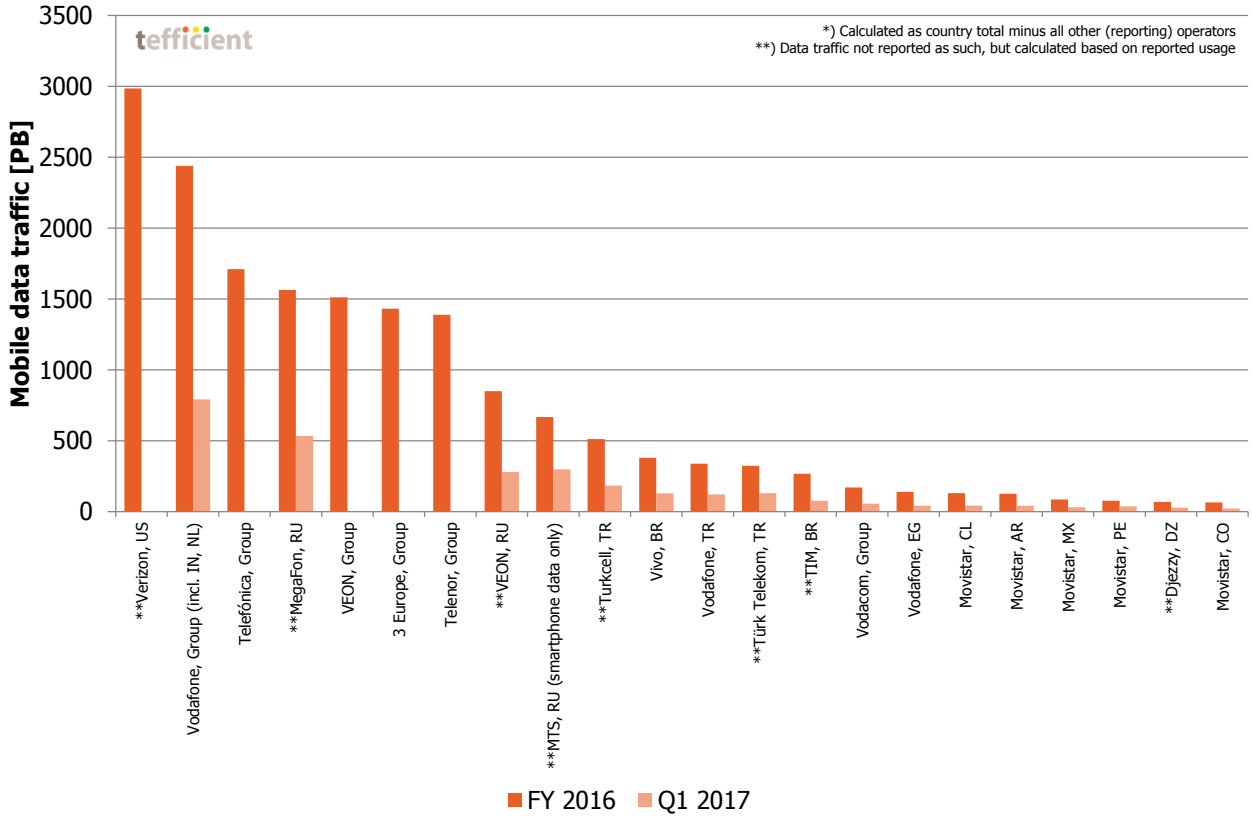

Figure 8. Total data traffic – Rest of world operators

Based on the conservative assumption described in the previous section, **Verizon** was a larger carrier of mobile data in 2016 than the whole of the **Vodafone Group** (ranked number 2). Verizon was also larger than the whole of **Telefónica Group** (#3).

Russian operator **MegaFon** (#4) is an international giant in mobile data. Even though MegaFon's local competitors VEON (ex-VimpelCom) and MTS are also large, MegaFon is larger. This can be attributed to MegaFon's acquisition of the 4G data-only specialist Yota back in 2013.

The Latin American operators are generally – with the exception of Chile – having low average data usage and end up in the bottom half of Figure 8.

Revenue per GB spans between 1.2 and 48.4 EUR

In our country report, we have focused on mature markets. The way we calculate revenue per gigabyte – *total* mobile service revenue per carried gigabyte – will resonate to mature markets where operators generally aren't attempting to monetise voice and SMS based on usage. Instead they have made voice and messaging allowances unlimited and included them in a flat fee.

In *maturing* markets, usage-based monetisation is still used to a much higher degree. This is true also for voice and messaging. With our calculation, one might conclude that the operators ending up with the highest effective revenue per gigabyte would thus be operator from maturing markets. Figure 9 is though showing that this is *not* the case.

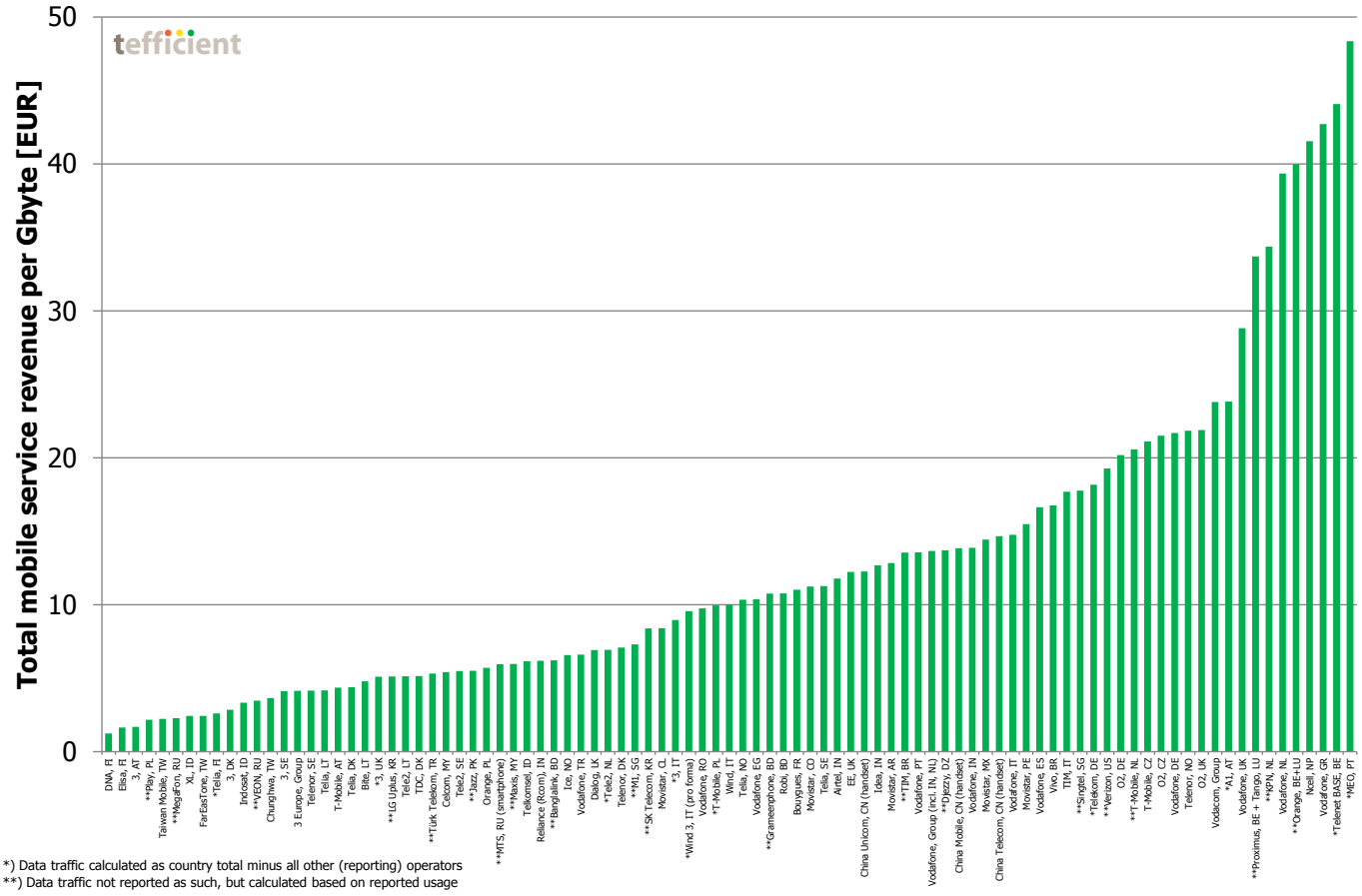

Figure 9. Total mobile service revenue per gigabyte – all operators[2]

We will – for readability reasons – soon break down Figure 9 in Europe, Asia/China and RoW, but let's first look into a disclaimer with regards to operators marked with * or **.

[2] That also report mobile service revenue

When reporting mobile data traffic, take inspiration from Vodafone and Telefónica

All graphs in this analysis carry this legend:

*) Data traffic calculated as country total minus all other (reporting) operators
**) Data traffic not reported as such, but calculated based on reported usage

There are a number of operators globally that, in their regular easy-to-use Excel sheets, report their **total mobile data traffic** quarter by quarter. Of the larger operators groups, **Vodafone** and **Telefónica** are two good examples. We encourage all operators to follow their example.

Some operators are instead reporting – or occasionally indicating – **data usage**. These are the operators marked with **. The problem here is that most operators aren't defining what a user is – sometimes it is all users, sometimes "active data users" (whatever that is), sometimes smartphone users, sometimes branded smartphone users, sometimes postpaid users. Typically these usage numbers are stated to impress, i.e. they are representative only for a smaller, high-usage, segment of the subscriber base. An exception to that operators reporting usage isn't reporting the number of users is **VEON** Group that reports the usage per mobile data customer *and* the number of such mobile data customers (which is a subset of the total customer base).

The majority of operators are still not reporting anything, though. Orange Group, Telia Company and Telenor Group are examples of it. And, of course, all North American carriers. In some cases, country regulators are helpful in reporting a breakdown per operator. But in most cases, the country regulator is just reporting a total. In such occasions – and if also all other operators report data traffic or at least usage – we have calculated the country residual and assumed that this traffic equals that of the non-reporting operator. These are the operators marked with *.

It's not necessarily so that a regulator and the reporting operators use exactly the same definition when reporting data traffic. Traffic via MVNOs can disturb the comparability. Where the error risks to be the largest, though, is in countries where the country residual has been assigned to a *-marked operator while, at the same time, one or several of the other operators are **-marked operators, i.e. have not explicitly reported the total data traffic but some type of usage.

So if any operator (*-marked or **-marked) is unhappy with its calculated data traffic, the solution is simple: Start to report your total mobile data traffic.

Having explained this, let's now in Figure 9 identify the operators that get the lowest total mobile service revenue per gigabyte in the world:

1. **DNA**, Finland – 1.2 EUR
2. **Elisa**, Finland – 1.6 EUR
3. **3**, Austria – 1.7 EUR
4. **Play**, Poland** – 2.2 EUR
5. **Taiwan Mobile**, Taiwan – 2.2 EUR
6. **MegaFon**, Russia** – 2.3 EUR
7. **XL**, Indonesia – 2.4 EUR
8. **FarEasTone**, Taiwan – 2.4 EUR
9. **Telia**, Finland* – 2.6 EUR
10. **3**, Denmark – 2.8 EUR

With the exception of XL from Indonesia, all these operators are active in high data usage markets where they have usage leadership positions. Even though **XL** (with 1.0 GB per SIM and month in 2016) is the local usage leader, 1.0 GB isn't high internationally, so it is instead the low revenue in Indonesia that explains the position.

The operators that get the *highest* total mobile service revenue per gigabyte in the world are:

1. **MEO**, Portugal* – 48.4 EUR
2. **Telenet BASE**, Belgium* – 44.0 EUR
3. **Vodafone**, Greece – 42.7 EUR
4. **Ncell**, Nepal – 41.5 EUR
5. **Orange**, Belgium & Luxembourg** – 40.0 EUR
6. **Vodafone**, Netherlands – 39.4 EUR
7. **KPN**, Netherlands** – 34.4 EUR
8. **Proximus**, Belgium & **Tango**, Luxembourg** – 33.7 EUR
9. **Vodafone**, UK – 28.8 EUR
10. **A1**, Austria* – 23.8 EUR

In this group of revenue per gigabyte maximisers, it is four – Vodafone Greece, Ncell Nepal, Vodafone Netherlands and Vodafone UK – that report their total mobile data traffic. For the other six, there is a risk of a calculation error as just described in the grey text box. Still, with the exception of A1 Austria and possibly MEO, the fact that also other operators of the same countries clutter in the top makes it is plausible that the top list *is* representative for the countries in which operators get the highest revenue per gigabyte: Belgium, Greece, Nepal (due to very, very low usage) and the Netherlands.

In the country report, you can also identify Belgium and the Netherlands as the two country markets (of the covered) with the highest revenue per gigabyte. As commented in that report, Greece would likely also be there – if 2016 data would be available from the Greek regulator.

We conclude that there is a **39-fold difference** between the operator with the highest revenue per gigabyte and the operator with the lowest.

Europe: Revenue per GB spans between 1.2 and 48.4 EUR

Figure 10 shows the European breakdown. Since European operators dominated both the bottom and top of the chart, the spread is as large as in the global view.

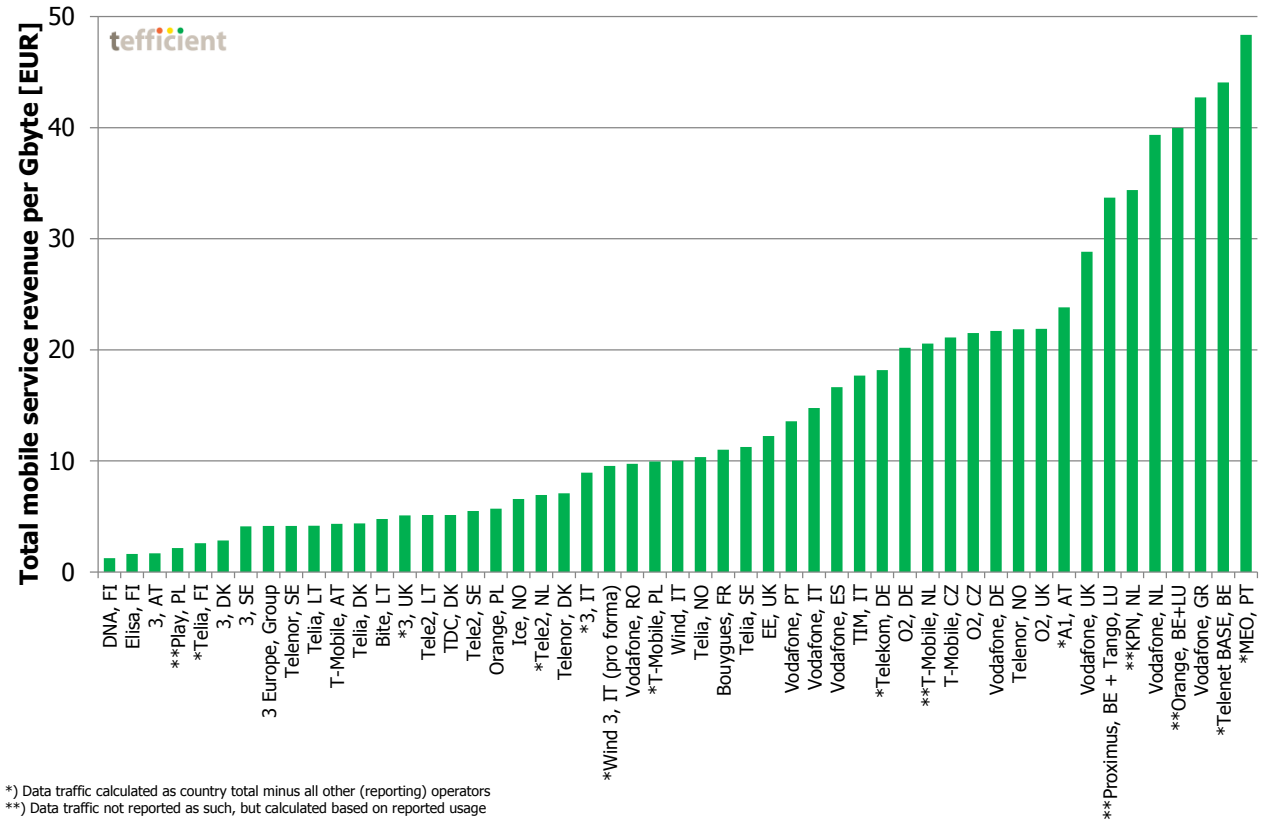

Figure 10. Total mobile service revenue per gigabyte – European operators

The position of '**3**' is important to point out: In each European market where it operates – Austria, Denmark, Sweden, the UK and Italy[3] – '3' has revenues per gigabyte which are lower than *all* of its local competition.

It's thus fair to say that '3' has done a lot to improve the competitiveness of many European markets when it comes to mobile data. At the same time, 3 Group has been allowed (by the European Commission) to consolidate several European markets; Austria, Ireland and Italy have all gone from four to three[4] MNOs based on initiatives taken by 3's owner **CK Hutchison**. The exception is the UK where the European Commission turned down 3's request to merge with O2.

[3] No data exists for 3 Ireland

[4] Italy will come back to four MNOs as a result of the remedies agreed with the EU: Iliad (owner of French operator Free) will use assets sold by 3 and Wind as basis for a new fourth MNO

Asia and China: Revenue per GB spans between 2.2 and 41.5 EUR

Figure 11 shows the Asian and Chinese operators. Taiwanese and Indonesian operators are having the lowest revenue per gigabyte whereas the mobile operators in **China** (based only on handset data) and **India** dominate the upper half. The latter is interesting given all the discussions following Jio's free data launch in September 2016.

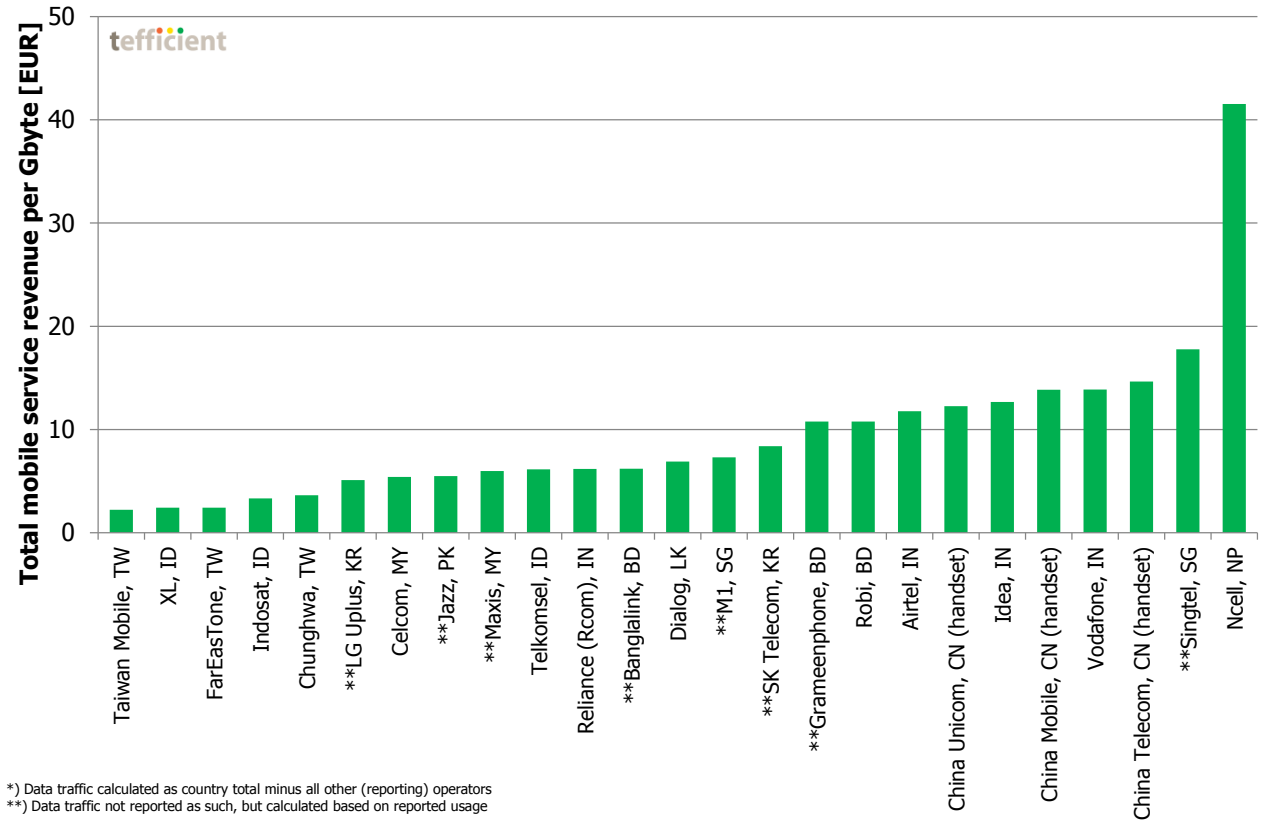

Figure 11. Total mobile service revenue per gigabyte – Asian and Chinese operators

We touched upon Ncell already – where very low data usage explains the position.

The difference between Singapore's **Singtel** and **M1** – which puzzles us – is likely to be found in how the two operators report data usage: Singtel is only reporting data usage per smartphone user – without reporting the number of such users. We made an assumption that the number of smartphone users equals the number of postpaid users. M1 is reporting usage both per postpaid smartphone and occasionally also per prepaid (smartphone?) user, but also here guidance on the number of such users is missing. Summing Singtel and M1 up makes the country residual (which should equal the third, non-reporting, operator StarHub) too small. Our country report shows that Singapore has the slowest growth in mobile data traffic of the 33 markets covered. In that perspective it's interesting to note that Singapore in the end of last year licensed a fourth mobile operator, TPG Telecom.

RoW: Revenue per GB spans between 2.3 and 23.8 EUR

Finally Figure 12 which shows the operators in the rest of the world alongside a few groups that separate out mobile service revenue in their reporting.

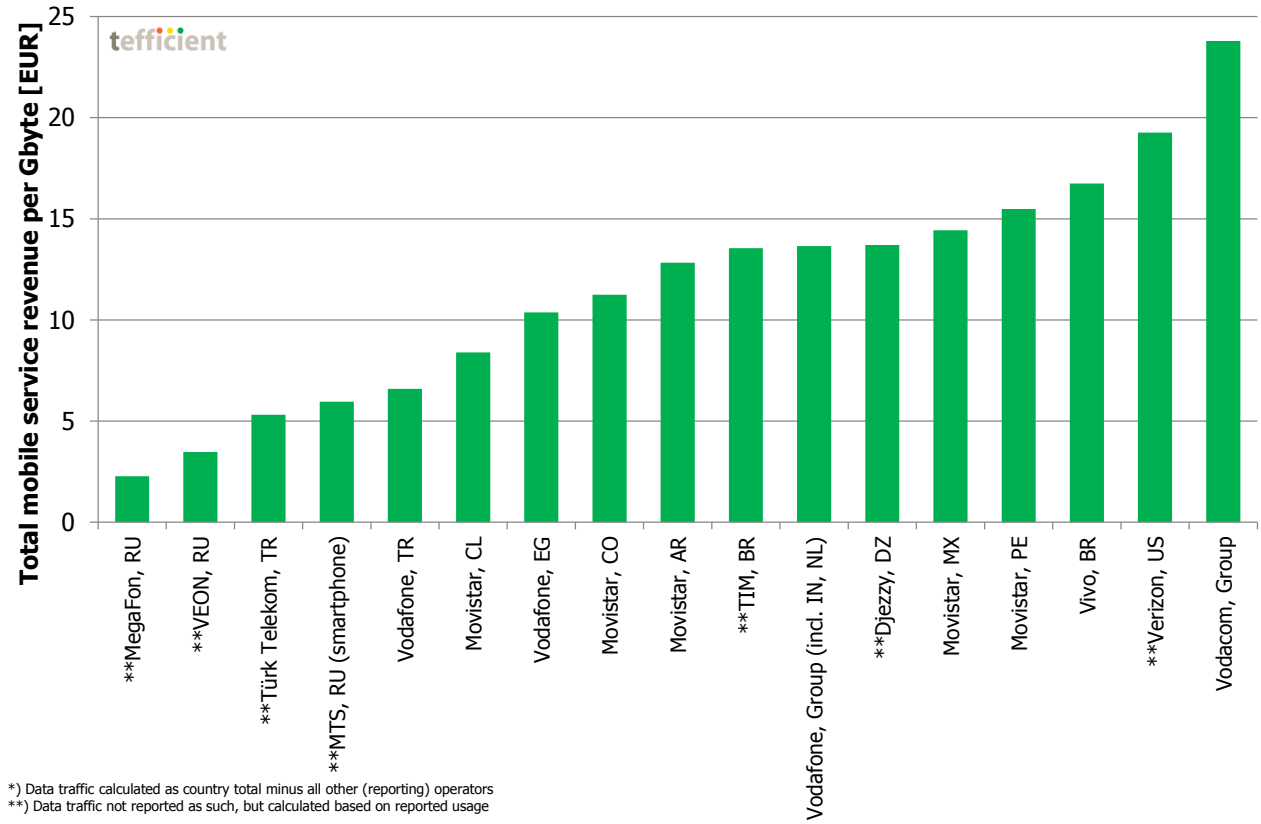

Figure 12. Total mobile service revenue per gigabyte – rest of world operators

Operators from Russia and Turkey have the lowest revenue per gigabyte whereas Latin American operators dominate the middle. Verizon is having the second-highest revenue per gigabyte in this RoW cluster, passed only by the South Africa-dominated **Vodacom** Group.

Let's put it all together

Let us now combine the revenue per gigabyte with the usage. Those of you that have read our data usage and revenue analyses before are familiar with the **revenue vs. usage** chart. But where it is normally populated with countries, it is for the first time now populated with operators, see Figure 13.

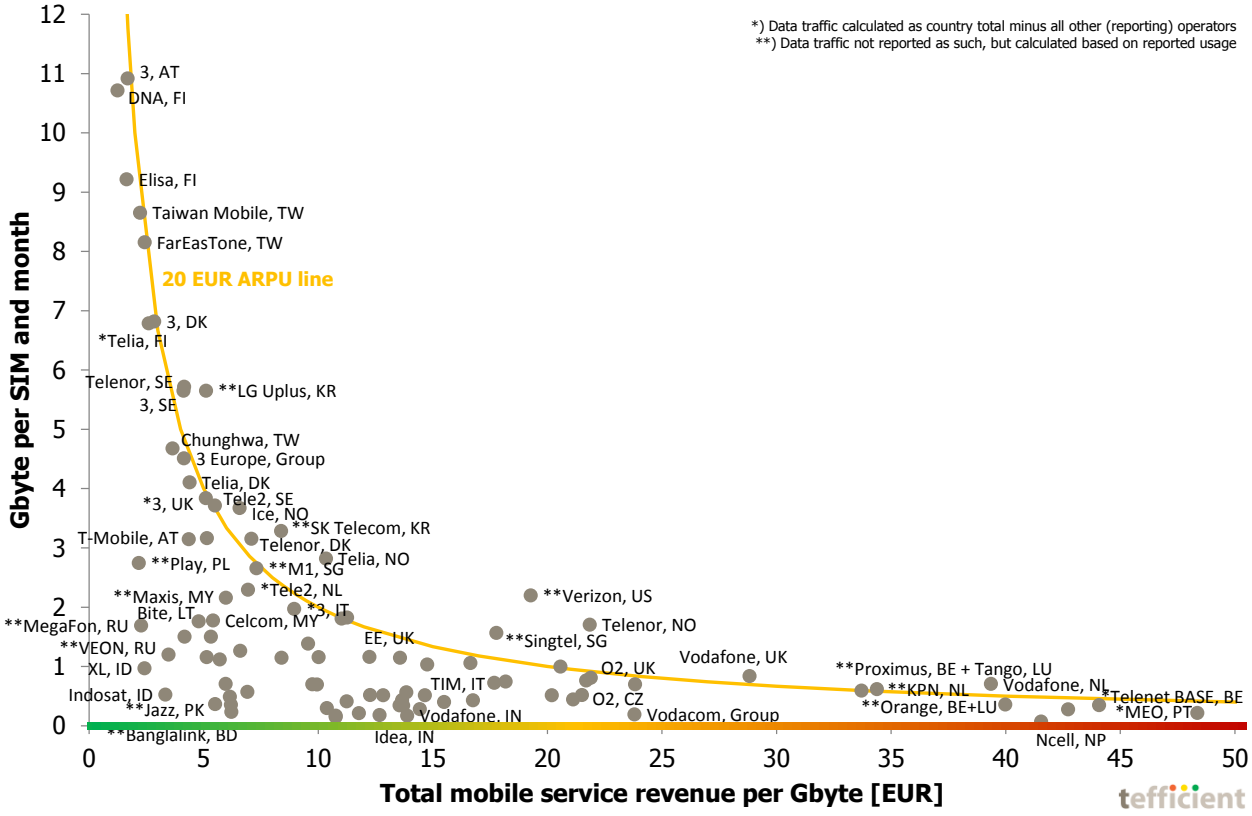

Figure 13. Mobile data usage vs. total mobile service revenue per Gbyte

With all those markers, we have only been able to highlight the operators that have more extreme positions. The amber line is not a regression line, but illustrates where 20 EUR of ARPU is earned.

Most mature markets operators operate with an APRU of around 20 EUR. Many operators in maturing markets clutter in the southwest or south parts of the chart.

One could criticise the chart for comparing the number of gigabytes with something that relates to it – the revenue per gigabyte. Our next chart, Figure 14, is therefore comparing the number of gigabytes with the revenue per subscription, i.e. the ARPU. And that is perhaps even more interesting.

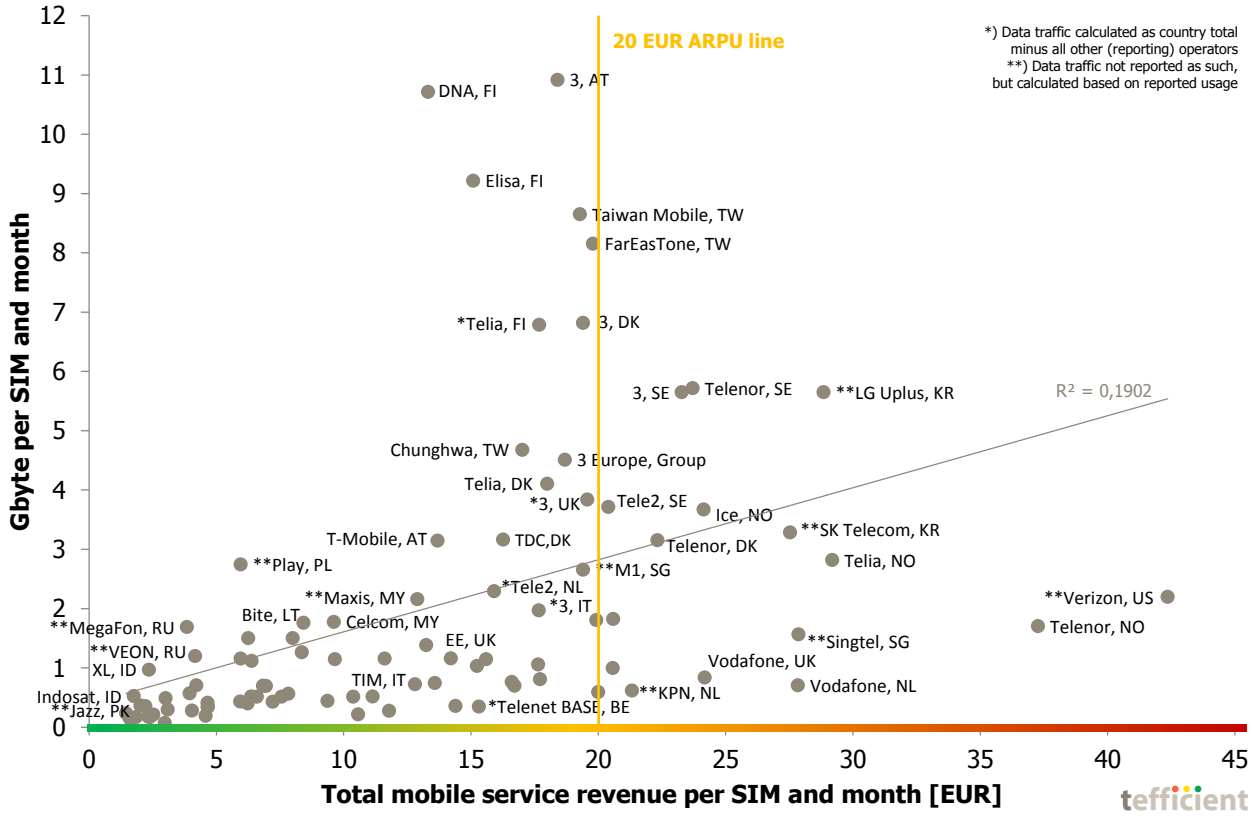

Figure 14. Mobile data usage vs. total mobile service revenue per SIM

Of the 93 operators in this sample[5], there are two – **Verizon** and **Telenor Norway** – that enjoy much higher total mobile service revenue per SIM than the other operators. It is interesting that this happens even though the mobile data usage isn't particularly high.

In contrast, there are a number of operators with just half that ARPU even though the average usage level is 3-5 times higher than Verizon/Telenor: **3** Austria and Denmark, **DNA**, **Elisa** & **Telia** from Finland and **Taiwan Mobile** & **FarEasTone** from Taiwan.

In general, there's a bit of hope in Figure 14, though: The grey regression line suggests that **operators with higher data usage have higher ARPU**.

To moderate this, one has to realise that the adherence to this line (shown by a R^2 value much below 1) is poor. And we should also remember that the line points to an international – not a national – trend: It is quite difficult to find national examples showing that operators with higher data usage enjoy higher ARPU. Quite often – like Figure 14 shows for e.g. the Netherlands, Finland and Norway – it is the opposite. It's the challenger operator that has the customers with the highest data usage and challenger operators tend to have lower ARPU than incumbents.

[5] All that report both mobile data traffic/usage and mobile service revenue

Conclusion

The viewpoint that the mobile data market is commoditised has become more prevalent in the last year. It's a view that many operators share.

Our analysis shows that this is just partly true: An absolute majority of mobile operators are getting revenues per gigabyte that signal **luxury goods, not commodity**.

We strongly believe that there's a **link between customer loyalty and high data usage**. And believe that what matters to the business performance of operators – today and even more so in the future – is boiling down to one thing: Customer loyalty.

We have said it before[6]: **Most mobile operators need to become more generous with data**. That's how you remain relevant and that's how you will keep your customers – because they love what they can do with data. And do not forget that Wi-Fi too is mobile data[7].

[6] E.g. in the conclusion of http://tefficient.com/unlimited-pushes-data-usage-to-new-heights/
[7] For inspiration, read: http://tefficient.com/upsell-and-loyalty-strategies-of-operators-using-public-wi-fi-as-customer-magnet/