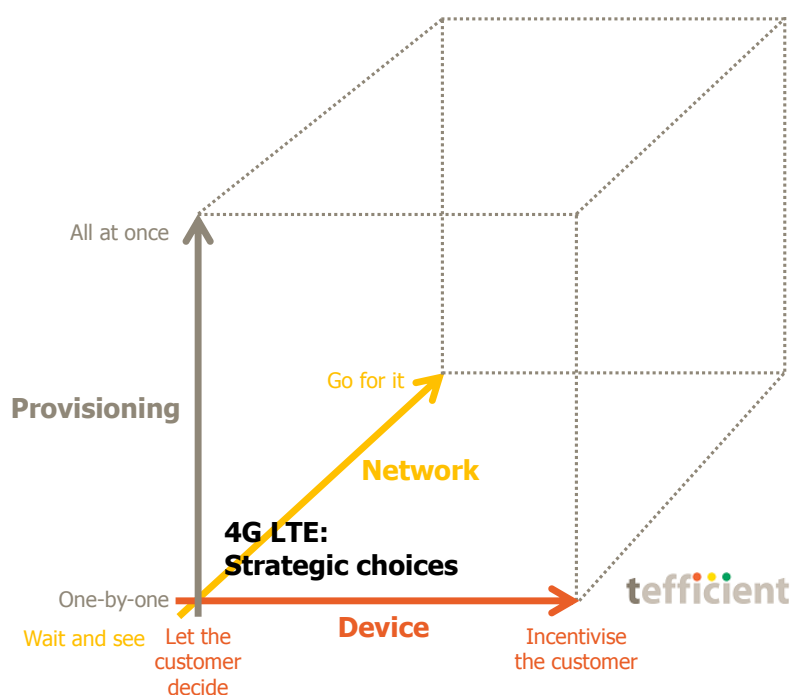


Examining the strategic choices of operators:

How 4G LTE became mainstream (for some)

Q3 2013 data from around the world



At *tefficient*, we've been having our ears to the ground for some time¹ picking up and summarising operator data on how 4G LTE adoption is developing globally. An absolute majority of operators who have launched 4G LTE still fail to report their 4G LTE customer number, their 4G LTE device penetration and their 4G LTE traffic level – but it's on its way up.

And for those that do report, the third quarter of 2013 represents a shift: No longer is 4G LTE a niche service for a few early adopters – instead it is mainstream. At least in parts of the world.

Three criteria need to be fulfilled to be able to count a user as a 4G LTE user: Device, Provisioning and Network. This analysis introduces *the 4G LTE cube* which visualises the strategic choices operators have when it comes to all three. So far, strategies differ very much – and they affect adoption strongly.

¹ See [Top LTE operators worldwide](#) and [Why mass marketing is inefficient when launching LTE](#)

What is a 4G LTE customer?

This may seem like a simple question, but it isn't that straightforward to answer.

In order for a cellular user to be a 4G LTE customer, the following criteria must be fulfilled:

1. The user must have a 4G LTE capable **device**
2. The user must be **provisioned** as a 4G LTE subscriber
3. The user must have access to a 4G LTE **network**

Let's examine the criteria one by one and look at the strategic choices operators have when it comes to each one of them.

The 4G LTE cube

Figure 1 introduces **the 4G LTE cube** in which operators can be positioned depending on their strategic choices when it comes to 4G LTE device, provisioning and network.

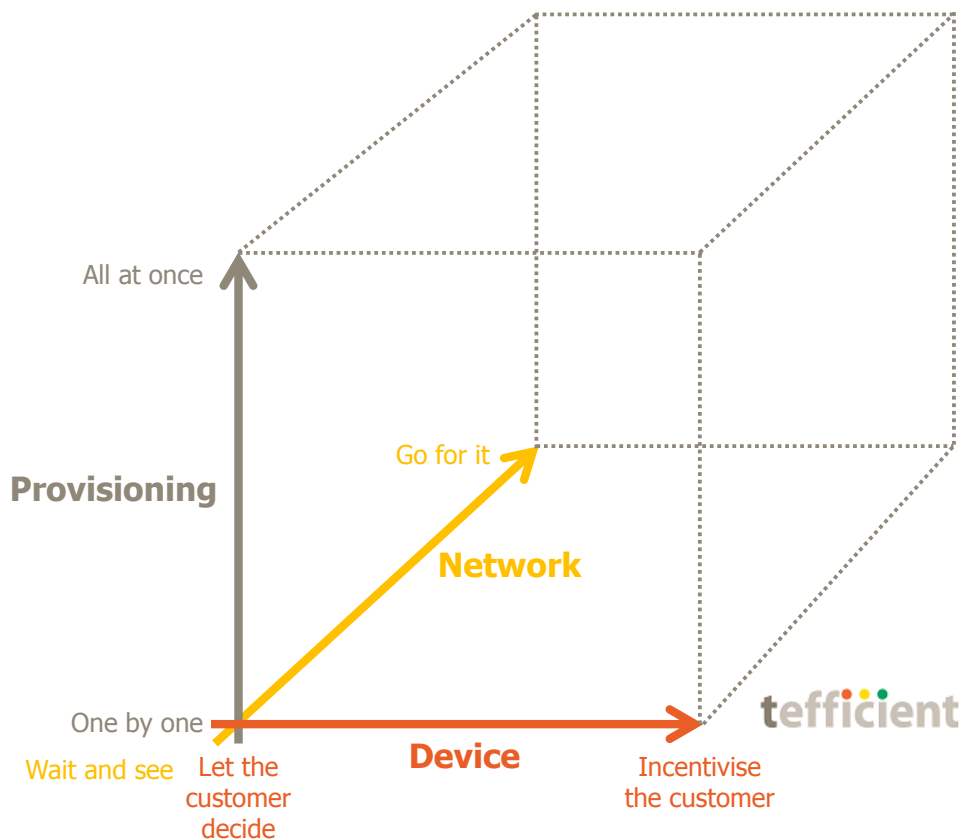


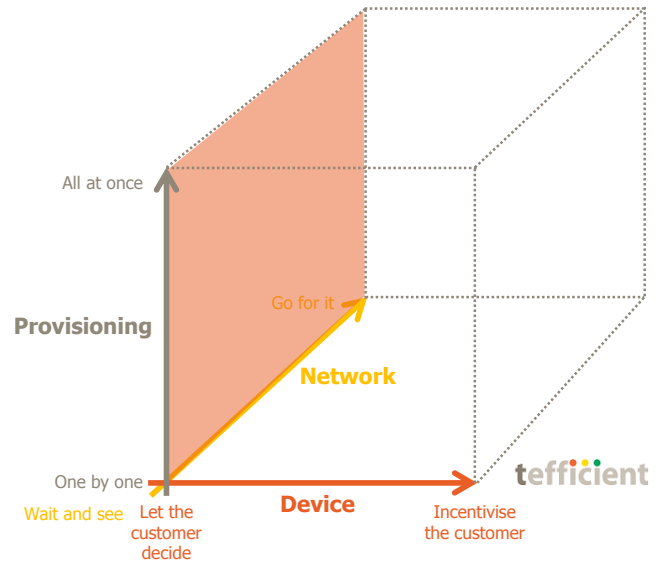
Figure 1. The 4G LTE cube with associated strategic choices

Criterion 1: Device

Strategic choice D₀: Let the customer decide

As reported in [Why mass marketing is inefficient when launching LTE](#) providing 4G LTE capable devices could be costly for mobile operators – as in many mature markets heavy handset subsidisation is in use at the same time as 4G LTE capable devices are the most expensive available – based on high specs combined with a typical relative shortage in supply.

If waiting for the user to make an active purchase decision in favour of a 4G LTE device, adoption will be delayed because of the price premium. The operator then risks having an underutilised 4G LTE network which isn't providing any return on investment – just to realise that further investments are needed in 3G networks.

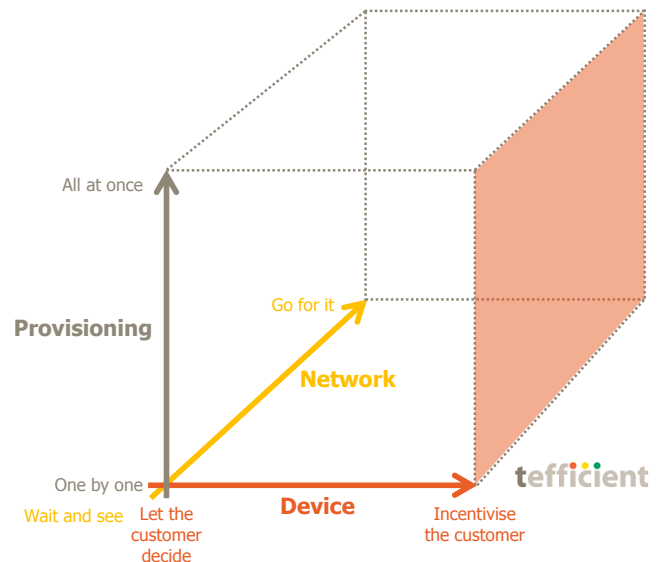


In large parts of Europe, the fact that the iPhone 5 didn't support the typical European 4G LTE bands came as a shock for operators. Bound to volume and price agreements with Apple, operators had to sell large volumes of subsidised iPhone 5 handsets pushing the break-even point of their 4G LTE investments forward and instead having to expand 3G capacity.

Strategic choice D₁: Incentivise the customer to switch to a 4G LTE device

The alternative is to make sure customers favour 4G LTE by subsidising capable devices much more than 3G devices. Apart from the fact that this is cost inefficient and at the expense of operator margin, it has in some cases proven to be *ineffective* when these subsidised 4G LTE devices end up with users that were attracted by the price but not having an actual need – or even living in areas where there is no 4G LTE coverage.

For more on this, see [Why mass marketing is inefficient when launching LTE](#).

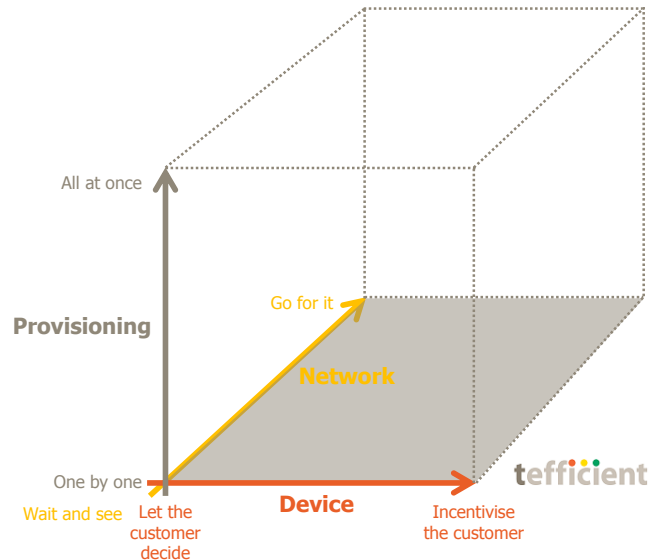


Criterion 2: Provisioning

Strategic choice P₀: Price 4G LTE at a premium, provision customers one-by-one

In markets like e.g. the UK, 4G LTE services are premium-priced compared to 3G. This is delaying adoption since there might well be users out there having a 4G LTE capable device without having a 4G LTE provisioned SIM. Another reason is of course that any customer will have to change to a new 4G LTE contract, something that typically is delayed by a combination of binding and notice periods on the running 3G contract. The benefit with this strategy is of course the revenue upside – and a high possibility to make sure that subsidised 4G LTE devices are tightly coupled with the signing of a suitable 4G LTE contract to ensure payback.

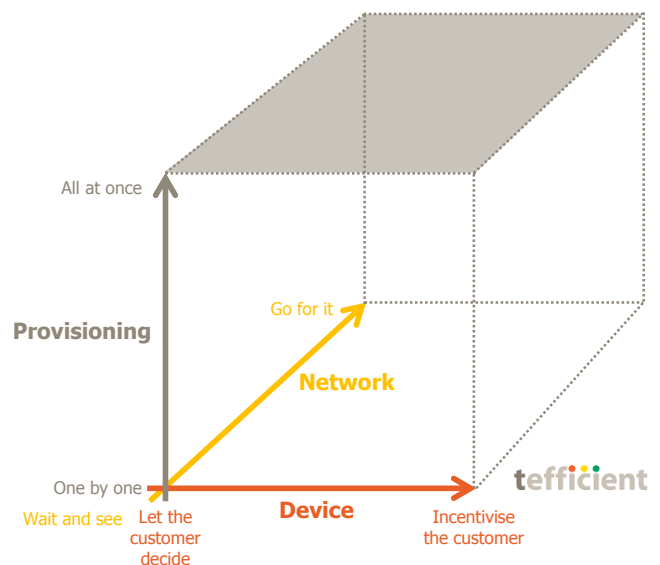
Many European operators have gone for the 4G LTE premium approach – the best example is perhaps **EE** who built a whole new brand around its 4G LTE offering and is migrating its Orange and T-Mobile customers onto EE. Another example is **Swisscom** who, in its Infinity plans, *solely* differentiate pricing based on data throughput – thereby making 4G LTE equal to the highest priced plan option. Some other European operators use a mix of volume and throughput based pricing, where 4G LTE throughput comes with higher data volumes – and a price premium. And there are those that include *mandatory* content in 4G LTE plans: **SFR** with e.g. Canalplay or Napster and **Vodafone** UK with Sky Sports and Spotify. Explains the price premium – and promotes data usage – but not for all.



Strategic choice P₁: “A Mbyte is a Mbyte”, so all customers can be provisioned at once

US operators are in contrast to most European operators not charging a premium for 4G LTE compared to 3G. It’s not about how *fast* you consume your Mbytes, it is still just about *how many* Mbytes you consume. Another example is **3** UK who has promised to make 4G LTE available to all customers – unlike EE, Vodafone and O2 – when they launch in December.

This approach has some merit in its potential to rapidly grow 4G LTE adoption. From one day to the next all 4G LTE capable devices out there – operator provided or not – are simply enabled. The higher throughput of 4G LTE is also helpful in the sense that the customer experience is improved, making the user consume more Mbytes and **reaching the cap earlier**. There is, in other words, a revenue upside for all those operators that have implemented volume based caps. This upside might well be as significant as in strategic choice P₀ above, which forces customers to take up a new, premium priced, 4G LTE subscription. Tele2 Sweden reported that during Q3 **58%** of their consumer customers bought additional data when a cap was reached.

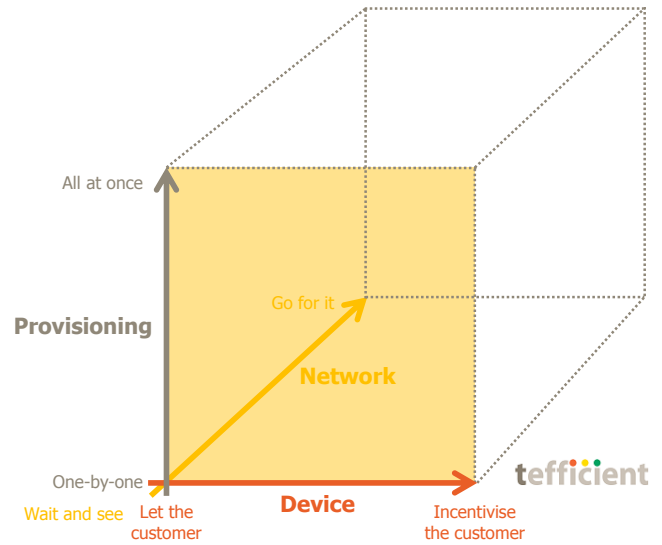


Criterion 3: Network

Strategic choice N₀: Wait and see

The financially constrained operator will minimise the 4G LTE rollout and attempt to balance it with the device adoption and the pricing & provisioning strategy. Competition will be monitored closely – and in some cases operators will seek to explore network sharing options before really starting any wider-area rollout of 4G LTE.

France is a good example of this where operators, burdened by the disruptive entry of Free Mobile, seem to have waited for someone else to take the first step into 4G LTE. Operator focus has been to develop and become competitive with web-only/SIM-only offers which never carry any handset subsidy and consequently aren't incentivising customers to buy 4G LTE devices. At the same time, 4G LTE network sharing agreements are being negotiated.

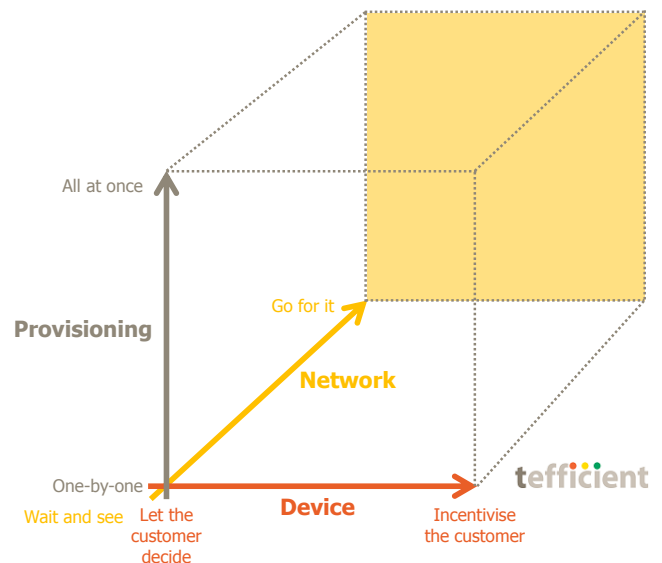


Strategic choice N₁: Go for it

Verizon of the US is perhaps the best example of this strategic choice. They decided – early – that 4G LTE is their future and that sustainable leadership is created by being first to market. European operators might argue that Verizon, being CDMA based, didn't have much choice than to leave CDMA behind. There is some merit in it, but Verizon's strategy not to look back and as rapidly as possible duplicate the 3G coverage has clearly strengthened Verizon's leadership position further. AT&T is today not much behind Verizon in actual 4G LTE coverage, but the *perception* is different.

In Europe, **Nordic operators** – especially Swedish – also went for the strategy to essentially overlay the 3G coverage with 4G LTE. In Sweden's case this was driven by **Telia's** early appetite for 4G LTE and by the network sharing JV formed between **Telenor** and **Tele2**. Given the early start, the 4G LTE customer take-up has however been disappointing. To a large extent this can be blamed on the high number of non-LTE capable iPhones around. The 3G networks are also among the world's best, making the incremental benefit going from 3G to 4G LTE smaller than elsewhere.

And then there is of course **Korea** and **Japan** where all operators have raced to roll out 4G LTE coverage as quickly as possible – while in parallel also rolling out operator Wi-Fi for mobile data offload.



4G LTE subscriptions

Figure 2 below compares the number of 4G LTE subscriptions in September 2013 of reporting² operators globally.

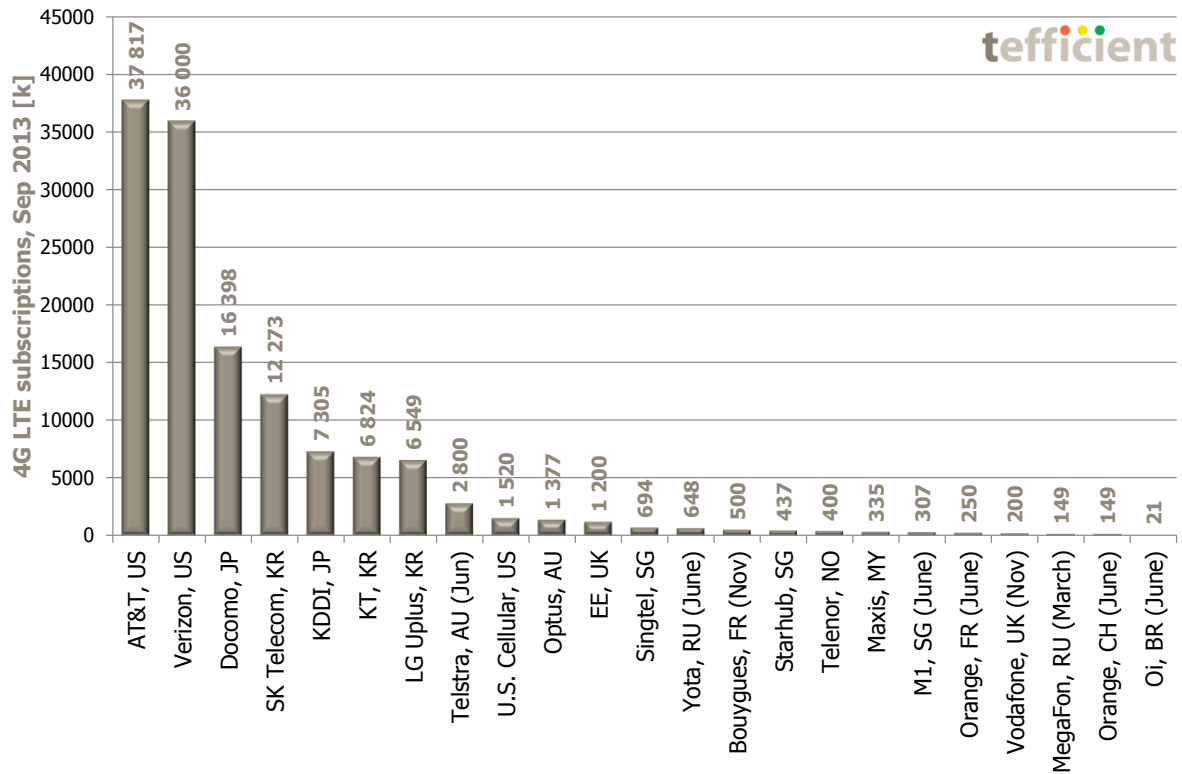


Figure 2. 4G LTE subscriptions of reporting operators September 2013 (if not stated differently)

If we trust that the reported numbers are comparable, **AT&T** has overtaken **Verizon** as the operator with the largest 4G LTE subscriber base in the world: 37.8 million.

Since both AT&T and Verizon are P_1 operators – i.e. they have provisioned 4G LTE for everyone – we don't know for sure if all reported subscriptions are actually within the 4G LTE coverage areas. Perhaps the US figures should therefore more be seen as how penetrated the customer base is when it comes to 4G LTE devices.

In October, Verizon said that they cover 303 million people in the US with 4G LTE (which means that the rollout more or less is done as it matches 3G). At the same time, AT&T said that they covered nearly 250 million people. Combining this with the fact that Verizon has the largest overall customer base in the US it leads to the conclusion that AT&T might well – as reported – have more 4G LTE devices within their customer base than Verizon, but some of AT&T's customers that are counted as 4G LTE are still likely seldom on 4G LTE. AT&T might have used device subsidy to put 4G LTE capable handsets in the hands of customers outside of the current coverage area. If so, it could have been at the expense of AT&T's margin.

² Some are not regularly reporting it, but indicating it from time to time using e.g. penetration figures within e.g. postpaid

Docomo is the largest Asian 4G LTE operator with 16.4 million Xi customers. Japanese operators are – in principle – not charging a premium for 4G LTE compared to 3G (but the price comparison is not always easy to make).

The three Korean operators **SK Telecom** (12.3 million), **KT** (6.8 million) and **LG Uplus** (6.5 million) are among the largest in the world in 4G LTE in spite of a population of just 50 million (Japan has 128 million and US 314 million). Penetration levels – see next section – will explain why. Korean operators aren't charging any premium for 4G LTE.

The European operator with the largest 4G LTE base is **EE**: 1.2 million. As said, EE charges a premium for 4G LTE – yet it has the largest base. It indicates how much behind other *large* European countries like France, Italy and Spain are when it comes to 4G LTE.

4G LTE penetration

Figure 3 below compares the 4G LTE penetration of the *total* subscription base of reporting operators globally.

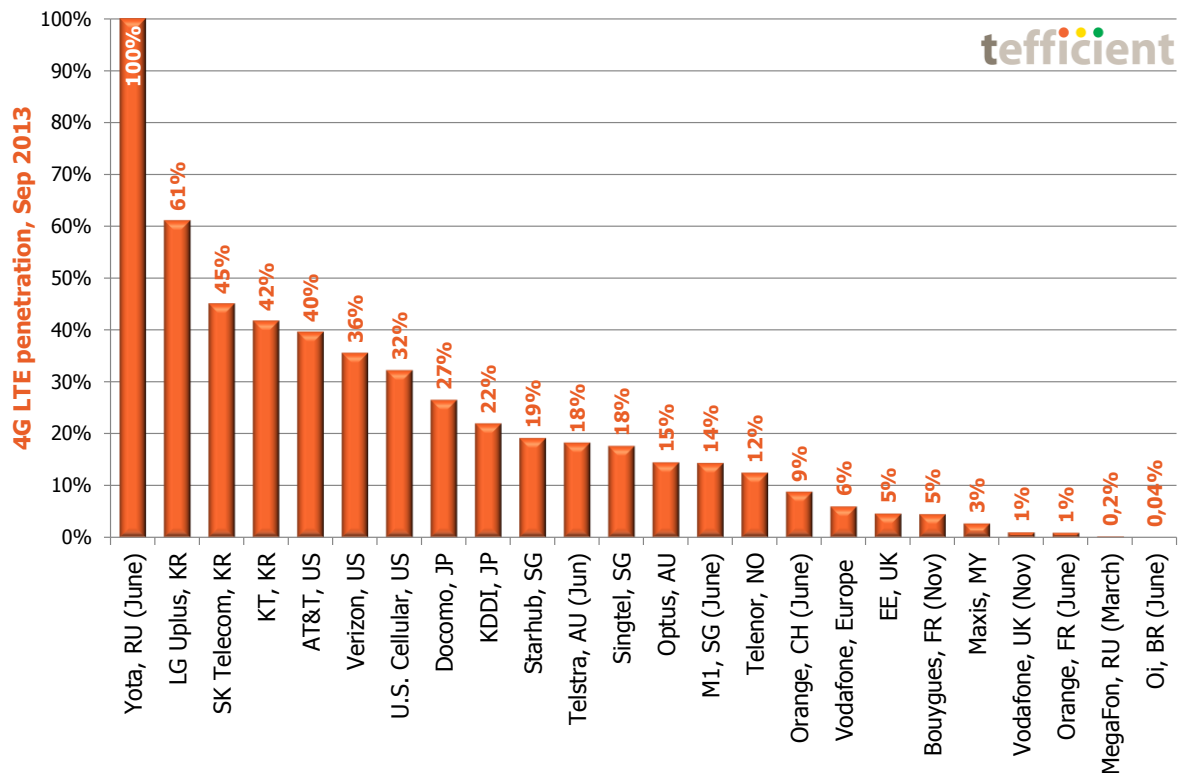


Figure 3. 4G LTE penetration of total subscription base of reporting operators September 2013³ (if not stated differently)

³ Vodafone Group Europe has been added but is not shown in Figure 2 since it is a cluster of 14 countries

Russian 4G LTE-only operator **Yota** – which in October was acquired by MegaFon – is the obvious leader in penetration with 100%. If Yota would have been part of MegaFon already in September, MegaFon's 4G LTE penetration would have been around 1%.

So when it comes to operational stand-alone operators, the three Korean operators are the world leaders in penetration: **LG Uplus** with 61%, **SK Telecom** with 45% and **KT** with 42%.

After these operators follow the US operators (32-40%), the Japanese operators (22-27%) and the three Singaporean operators **Starhub**, **Singtel** and **M1** (14-19%) – alongside Australian operators **Optus** (15%) and **Telstra** (18%⁴).

The European operator with the highest reported 4G LTE penetration is **Telenor** in Norway with a modest 12%. Telenor falls into the P₀ category as they charge extra for full 4G LTE throughput (even though data volume is also increased).

All operators in Figure 3 with higher penetration than Telenor are P₁ operators, i.e. they *don't* charge any premium for 4G LTE. So if your intention is to grow 4G LTE penetration, you know which approach is most effective. What's best for revenue and margin can be debated.

4G LTE traffic

Very few operators report their 4G LTE data traffic (or indicate the 4G LTE share of total traffic). Table 1 lists those that do.

Operator	Share of total data traffic in 4G LTE September 2013	Total 4G LTE traffic, quarter to September 2013 (Terabyte)
Verizon, US	64%	n/a
Tele2, Sweden	⁵ 61%	n/a
Vodafone Group, Europe ⁶	⁷ 16%	13958

Table 1. 4G LTE traffic of reporting operators September 2013

In addition to Table 1, it should be mentioned that **Korea** as a country already in May 2013 had above **70%** of all data traffic from smartphones carried over 4G LTE (as reported by the regulator). Given the Korean 4G LTE penetration leadership, it is logical that the traffic share is high.

⁴ Telstra reports the cumulative number of 4G LTE devices sold – all might not necessarily be in operation still so penetration can be somewhat exaggerated

⁵ Read from a graph

⁶ Germany, UK, Netherlands, Turkey, Czech Republic, Hungary, Ireland, Romania, Italy, Spain, Greece, Portugal, Albania and Malta – but 4G LTE not yet launched in all 14 countries

⁷ "Now" which might mean end of September 2013 or Apr-Sep 2013

Verizon is already in the situation that 4G LTE capacity has [turned into an issue for them](#) in a few major markets – remedy is promised by year-end.

As to **Tele2** Sweden, they have not indicated their number of 4G LTE users since end of 2012 when penetration was at a low 4%. Through recent campaigns, penetration has likely increased a lot, but much of the 4G LTE traffic is driven by Tele2’s ambition to replace some fixed broadband with 4G LTE using dedicated 4G LTE routers. The traffic profile from these routers, who can connect several continuous users in home or small office environments, is obviously very different than a normal mobile user or even a dongle.

Mapping operators onto the 4G LTE cube

In Figure 4, we’ve mapped some of the reporting operators onto the 4G LTE cube. It attempts to demonstrate how widely different strategic choices operators have made when it comes to 4G LTE.

To exemplify, **EE** is in the right hand, bottom, corner ($D_1P_0N_1$) of the cube because of its clear ambition to drive 4G LTE adoption through high handset subsidy – clearly targeting existing Orange and T-Mobile customers as reported subscriber retention cost is high both in absolute terms, but also in relation to subscriber acquisition cost. At the same time, EE has been running ahead of all other UK operators in its ambition to build 4G LTE coverage – helped by Ofcom’s acceptance of EE’s spectrum refarming ahead of the 4G LTE auction. Lastly, EE has made 4G LTE a premium priced service, which requires individual provisioning.

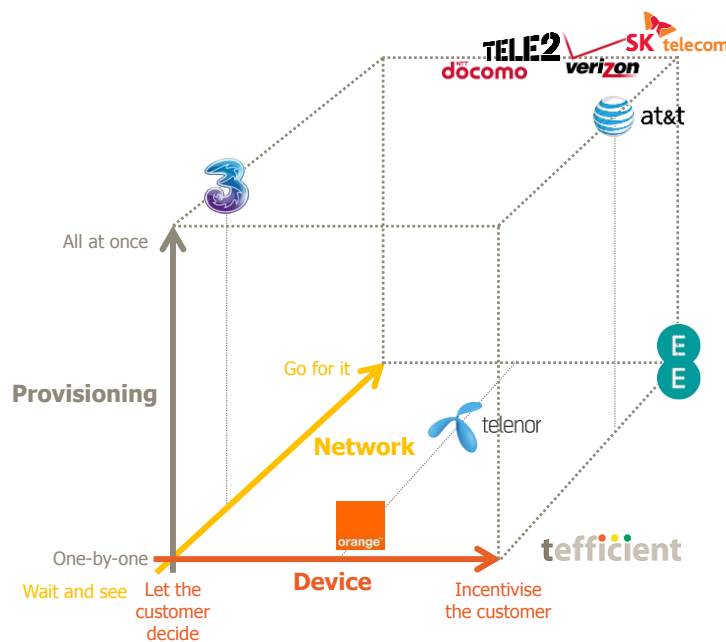


Figure 4. A few of the reporting operators mapped onto the 4G LTE cube⁸

Verizon is on the back plane of the cube – further back compared to AT&T – due to its early rollout start and its leadership in coverage. To compensate, **AT&T** has likely used more handset subsidy, resulting in a

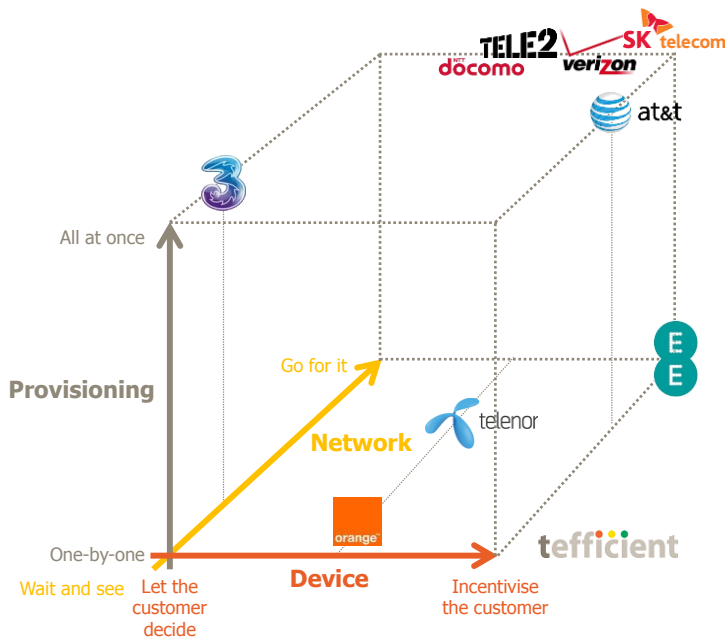
⁸ 3 refers to 3 UK, Telenor to Telenor Norway, Orange to Orange France and Tele2 to Tele2 Sweden

higher 4G LTE penetration in spite of its smaller coverage area. That's why AT&T in the cube is indicated to have incentivised the customer to a larger extent than Verizon. Both operators are providing 4G LTE without a premium, so ending up in the top of the cube.

A few other examples are also shown. **If you are an operator, you might want to consider your own position – and ask if you have sufficient distance to your competitors.**

Conclusion

The global leadership in 4G LTE continues to be in Korea, Japan and the US – where 4G LTE actually has become mainstream. Singapore and Australia is on the edge of mainstream. In Europe, some operators are eventually getting more vocal about rollout achievements while reporting on customer numbers and traffic is still very patchy.



The **4G LTE cube**, as introduced in this analysis, visualises how different operator strategies really are.

The cube can help us to understand why European 4G LTE numbers are small: After having financed a large share of the initial smartphones for their customers, European operators – given the macroeconomic situation – want to avoid having to do it again and are thus **waiting for their customers** to make the right decision and buy a 4G LTE device without too much financial incentive.

The second reason is that many European operators – in contrast to Asian and American – have decided to **charge a**

premium for 4G LTE even when data volumes are capped.

The last reason is the fact that in Central and South Europe **4G LTE network deployment** has begun very recently.

Hopefully the “build it, and they will come” idiom will apply, but this analysis shows that a gentle push speeds things up.