

# 5G Outlook in Europe

A Northstream opinion  
2019

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# Executive summary

## *What is the current status in the “race” to 5G?*

As of June 2019, 5G NR deployments have started across several developed countries in Asia, the US and Europe. So far, the **South Korean** mobile network operators (MNOs) have made the most substantial progress, having reached 2,000,000 5G subscribers already roughly four months after rollouts began. In the US, the main contender for achieving the largest population coverage in the quickest time is the **future new T-Mobile after the merger with Sprint**, which we believe is likely to also take the final hurdle. Meanwhile, **European** operators, while having commenced rollouts in a number of countries, mostly do not have similarly ambitious targets. Currently, deployments are rather focused mainly on larger cities and, in some countries, fixed wireless access (FWA).

## *Is Europe overall ready for 5G?*

One argument made by European regulators and MNOs is that it makes more sense to **wait and learn** from their Asian and American peers before ramping up 5G deployments themselves. They would then be able to catch up once the time is right, buoyed up by the good amount of mid-band spectrum they would then have obtained. However, this viewpoint neglects two important aspects. First, the fact that **US operators will remain capable of continuously outspending their European counterparts** by virtue of their higher ARPU levels. Second, while mid-band spectrum is more available in Europe than in the US, assignments are **not well-coordinated** across country borders and some auctions have ended up with **hefty price tags and asymmetric allocations** across operators. Europe overall can therefore be said to be at a **risk of falling behind** other developed regions when it comes to rolling out 5G.

## *What rollout pace can we anticipate and what would be the potential consequences of being behind?*

Northstream has conducted a study in which we have modeled the 5G rollout on mid-band spectrum in terms of population coverage for the respectively largest operator across seven countries: US, Japan, Germany, France, Italy, UK and Spain. For the US, we have additionally modeled Sprint and then the new T-Mobile, after their probable merger. Our findings show that while the new T-Mobile and Japan can be expected to lead in deployment pace, the **European countries will overall be the slowest**, coming in after the largest operator in the US. This result is related to the aforementioned higher spending power of American MNOs.

This lag will eventually lead to many European enterprises **getting access to the newest mobile-related technologies and innovations at a later stage** which, in turn, is expected to limit their own innovation capabilities. European consumers will then also be able to use the newest services only later and/or to a lesser extent than those in other developed markets, which will keep **their total spend on mobile-related offerings at an overall lower level**. Ultimately, GDP growth in Asia and the US can then be anticipated to benefit more from 5G than in Europe.

## *What can be done on the regulatory level to put Europe on the right track to 5G?*

Ultimately, policymakers in Europe ought to facilitate 5G deployments in two major ways. First, spectrum and infrastructure policies need to be adjusted to **alleviate financial burdens on MNOs, improve cross-border coordination and reduce regulatory hurdles to site build-outs**. Second, the practices on **new entrants and market consolidation** should be reviewed in order to create market players that can roll out and run networks in the most economical manner.

# 1. The race to 5G

In April 2019, all three South Korean mobile network operators (MNOs), SK Telecom, KT and LG Uplus launched what they marketed as nationwide 5G New Radio (NR) networks, i.e., networks that use a new radio interface designed to deliver 5G. While “nationwide” does not yet mean everyone in the country, their numbers are impressive nonetheless, with, e.g., KT targeting more than 80% population coverage by end-2019<sup>1</sup>. The South Korean operators have been remarkably fast in deploying massive numbers of 5G base stations (more than 85,000 already by April<sup>2</sup>) and have reached 1,000,000 5G subscribers faster than with 4G<sup>3</sup>, as well as a threefold increase in average monthly per-user data consumption for those users<sup>4</sup>. This steep uptake has been significantly facilitated by the timely availability of large chunks of mid-band spectrum and corresponding 5G handsets in South Korea.

Meanwhile, in the US, operators Verizon, AT&T and T-Mobile have launched 5G NR networks on mmWave spectrum in selected cities, while fourth-placed operator Sprint has also kickstarted its 5G offering, eyeing larger-scale deployments by using its 2.5 GHz spectrum holdings. T-Mobile and Sprint have recently pledged to cover 97% of the US population within three years if their merger does get the go-ahead<sup>5</sup>. Simultaneously, there is a national strategy to ensure leadership in 5G. A main pillar of that

strategy is the FCC’s *5G FAST Plan*. “FAST” stands for “Facilitate America’s Superiority in 5G Technology”, and the plan is intended to accomplish three things: Flood the market with flexibly usable spectrum, speed up site approvals, as well as lower costs and modernize regulations to incentivize more fiber deployment.

In China, the three MNOs announced their 5G CAPEX plans in April 2019. And while those expenditures ended up being lower than expected, China is nonetheless anticipated to become one of the main 5G markets, with operators assumed to invest between USD 200-350 bn between 2020 and 2030<sup>6</sup>. Commercial 5G is expected to be launched in China in October 2019<sup>7</sup>.

Europe, on the other hand, has been rather reserved when it comes to taking pioneering action on 5G. Spectrum auctions in several large European markets have been poorly designed (cf. UK, Italy, Germany) or have not even taken place yet (e.g., France, Poland). In Italy and Germany, auctions did conclude toward the end of 2018/in June 2019 but ended up costing the MNOs so much that the speed and quality of actual 5G rollouts in terms of achieving robust networks with a high population coverage may very well suffer. In Germany, a new entrant was furthermore allowed into the market, who will not be able to achieve substantial coverage on its own.

<sup>1</sup> Source: <https://www.ericsson.com/en/cases/2019/korea-telecom-has-switched-on-5g>

<sup>2</sup> Source: <https://www.telegeography.com/products/commsupdate/articles/2019/04/09/south-korean-initial-5g-coverage-reportedly-clustered-in-major-cities/>

<sup>3</sup> Source: <https://www.lightreading.com/mobile/5g/kt-claims-400k-of-south-koreas-1m-5g-subs/d/d-id/752146>

<sup>4</sup> Source: <https://www.mobileworldlive.com/asia/asia-news/data-use-surges-on-korea-5g-networks/>

<sup>5</sup> Source: <https://venturebeat.com/2019/05/20/fcc-chair-backs-merger-after-t-mobile-and-sprint-pledge-97-u-s-5g-coverage-in-3-years/>

<sup>6</sup> Source: <https://www.printedelectronicsworld.com/articles/16958/is-5g-slowing-down-in-china>

<sup>7</sup> Source: <https://www.theverge.com/2019/8/5/20754503/zte-axon-10-pro-5g-china-release-date-news-features>

Out of all European operators, so far Vodafone in the UK, Italy, Germany, Spain, Romania and Ireland, Deutsche Telekom in Germany, Telecom Italia in Italy, EE and 3 in the UK, Swisscom and Sunrise in Switzerland, Elisa in Finland, T-Mobile in Austria, Digi in Romania as well as Monaco Telecom in Monaco have launched commercial 5G networks as of the time this report was written. While this does seem like a lot, most of these MNOs have restricted their 5G launches to a relatively limited number of larger cities. The 5G launched by 3 in the UK, T-Mobile in Austria and Sunrise in Switzerland, on the other hand, is so far used to deliver fixed wireless access (FWA) services. Only Swisscom, whose 5G network in April went live across 54 Swiss towns currently appears to have ambitious rollout plans for mobile 5G akin to those in South Korea and the US in terms of population coverage, targeting 90% as soon as by the end of 2019<sup>8</sup>.

Therefore, we observe that, when compared to Asia and the US, European regulators and operators overall seem to have taken on more of a “wait-and-see” approach. This begs the question: Can Europe be left behind in 5G? And if so, what negative consequences would this actually entail for European countries and what could be done to prevent or at least mitigate them?

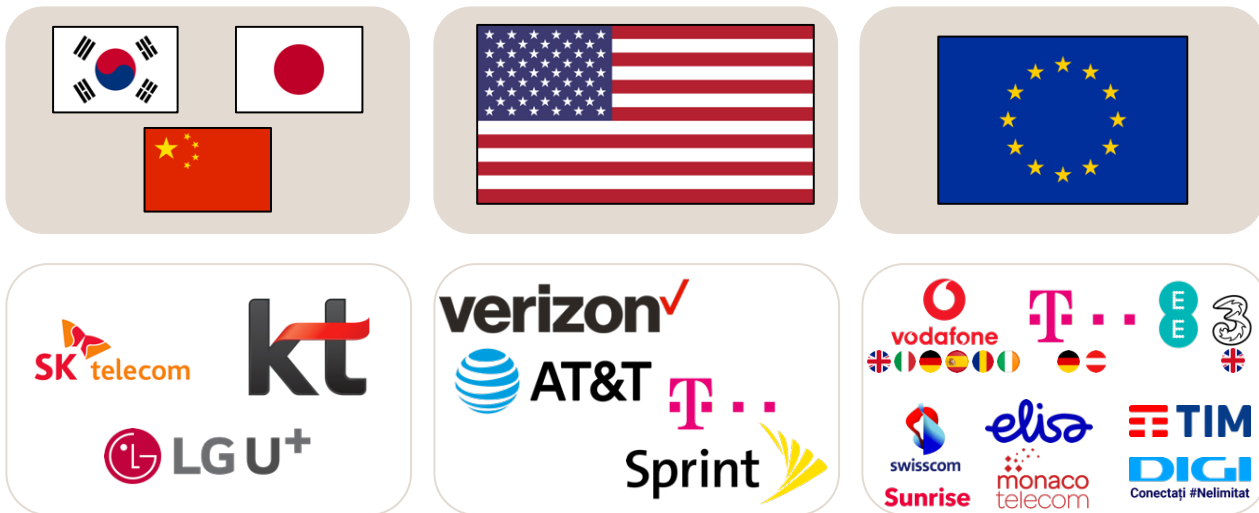


Figure 1 Overview of MNOs that so far have commercially launched 5G NR across Asia, the US and Europe

<sup>8</sup> Source: <https://www.swisscom.ch/en/about/news/2019/04/17-erstes-5g-netz-live.html>



## 2. Europe's 5G readiness

### *Is Europe all set and ready for 5G?*

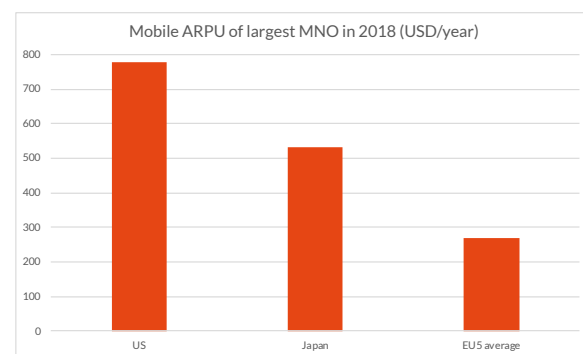
The restrained approach toward 5G in Europe has partly stemmed from the belief that it is wiser to wait until 5G has matured both from a technological and a use case point of view before ramping up investments. European operators also want to learn from their Asian and American counterparts before scaling up 5G themselves. The need for 5G in Europe may not even be as high as, say, in the US, as existing 4G networks are not as loaded and FWA is of lower relevance. So, could it be as simple as waiting, getting smarter and then catching up to the others once the time is right?

European MNOs certainly do have an advantage over their mmWave-restrained peers in the US (at least the two larger ones) when it comes to spectrum holdings: The crucial 3.5 GHz (“mid-band”) range was identified for 5G by the European Commission as early as 2016 and corresponding spectrum has been or is being cleared in many countries. Our research furthermore indicates that leading European operators would have to carry out much fewer upgrades and build a lot fewer new sites to serve urban and suburban areas with speeds of 50 Mbps than the big MNOs in the US (cf. *Section 3*). Consumer prices for mobile broadband are also lower in Europe than in the other regions which one could expect to speed up end-user adoption. All good then?

### *Lower ARPU levels in Europe limit mobile CAPEX*

Well, not quite. To begin with, low prices may be good for consumers, but they naturally limit the revenues of European MNOs and thus their ability to keep up with their American and Asian counterparts when it comes to network CAPEX. The focus of European regulators during the past decades has invariably been to assure for

strong competition within the national markets in order to keep consumer prices for mobile broadband as low as possible. This has arguably been achieved, as the corresponding ARPU levels in Europe are roughly 50-65% lower than those in the US and Japan<sup>9</sup> (see *Figure 2*). Total mobile revenues in Western Europe declined by 4.6% in the last ten years, while they increased by 3.6% in the US and 2% in Japan, respectively, during the same timeframe<sup>10</sup>.



*Figure 2 2018 Mobile ARPU for each country's largest MNO (EU5: Germany, France, Italy, UK, Spain)*

<sup>9</sup> Source: Ovum

<sup>10</sup> Source: Ovum

The origin of the problem for European operators thus lies in these substantially lower ARPU levels that they are able to generate. This leads to a situation in which MNOs in Europe are constantly outspent in mobile CAPEX by their peers in the US and Japan on a per-capita basis<sup>11</sup> (see *Figure 3*). The resulting gap is expected to widen even further as we enter the 5G era.

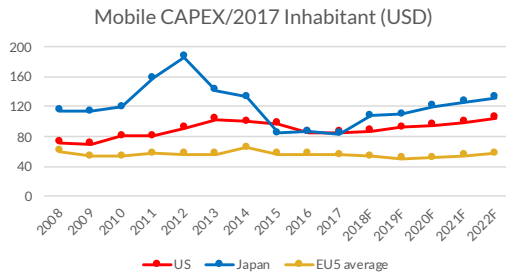


Figure 3 Mobile CAPEX/2017 population 2008-2022

At the same time, the CAPEX-to-revenue ratios of European operators are currently at historically high levels and are higher than those in, e.g., the US and Japan<sup>12</sup> (see *Figure 4*). And yet this is still not enough to make up for the gap in CAPEX invested per inhabitant.

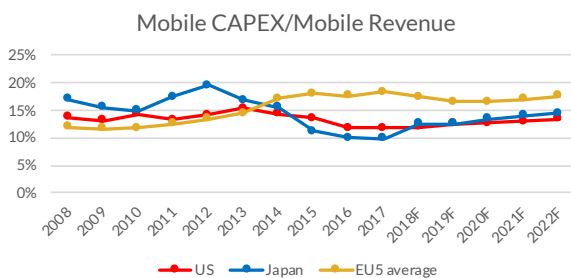


Figure 4 Mobile CAPEX/Mobile Revenue ratios 2008-2022

Whether or not it is more expensive to roll out 5G in the US due to immature technologies, thinner grids and a lack of mid-band spectrum becomes a lot less relevant once one has acknowledged that US operators will always be able to outspend their European peers simply by having a higher CAPEX budget to begin with. We further believe that it is incorrect to assume that European MNOs could eventually catch up once technology has matured and prices fallen. Network investments are not carried out in one go and grids require continuous upgrades to retain their quality and

stay competitive, which is why the illustrated gap cannot be easily closed.

One usual alternative for European operators to increase their top line is to merge with a competitor. Yet, competition authorities in many markets have been opposed to consolidation, worrying about the price increases that it could lead to. In some markets in which mergers were allowed and the number of MNOs went from 4 to 3, a new fourth entrant was let in not too long after that (cf. Italy, Germany). While this policy has impeded the emergence of financially stronger operators in Europe, a different approach has been chosen in the US. Provided the merger between T-Mobile and Sprint is finally approved<sup>13</sup>, the US operator market is on the verge of eventually seeing the creation of a third strong telco<sup>14</sup>. This new T-Mobile will be able to effectively compete with Verizon and AT&T both financially and from a spectrum holdings perspective.

### *Varying and costly spectrum assignment in Europe*

Even the advantage of having mid-band spectrum available in Europe is watered down by a plethora of involved national regulators who each have their own timelines, as well as by delayed, lengthy and costly spectrum auctions (e.g., Italy, Germany). Consequently, actual larger-scale rollouts are likely to get pushed to 2020 at the earliest in many European markets. Italy's spectrum auction resulted in a whopping USD 0.40/MHz/pop for mid-band spectrum, while the one in Germany dragged on for three months before finally finishing in June 2019 after almost 500 bidding rounds<sup>15</sup>. The eventual amount of spectrum purchased by each of the four German MNOs ended up being not too different from what they had bid for roughly 400 rounds prior. Therefore, the auction led to a price inflation of more than EUR 4 bn which could have been invested into network rollout CAPEX. Deutsche Telekom has stated that the total auction proceeds (roughly USD 7.4 bn) could have financed the build-out of some 50,000 new sites<sup>16</sup>.

In both Italy and Germany, a flawed auction design was a major problem, as the regulators decided not to release the full amount of spectrum in the 3.5 GHz range and/or had chopped the auctioned spectrum blocks unevenly (in Italy, two blocks of 80 MHz and 20 MHz, respectively). This eventually forced the MNOs

<sup>11</sup> Source: Ovum

<sup>12</sup> Source: Ovum

<sup>13</sup> We believe a final approval to be likely, despite the ongoing lawsuit of several US states against it; the corresponding trial is currently scheduled to start on October 7, 2019. Source: <https://www.rcrwireless.com/20190624/carriers/four-more-states-join-lawsuit-opposing-sprint-t-mobile-us-merger>

<sup>14</sup> In the US, too, another player – Dish – will become the fourth nationwide operator as part of the merger approval, by being allowed to acquire/receive access to business, infrastructure and spectrum assets from Sprint. However, we believe that this should not substantially hamper the new T-Mobile's ability to become a strong

third telco next to Verizon and AT&T, not least because it will still have competitive spectrum holdings and a comparably large customer base.

<sup>15</sup> Source:

[https://www.bundesnetzagentur.de/\\_tools/FrequenzXml/Auktion2019\\_XML/497.html](https://www.bundesnetzagentur.de/_tools/FrequenzXml/Auktion2019_XML/497.html)

<sup>16</sup> Source: <https://www.rcrwireless.com/20190614/5g/germany-completes-5g-spectrum-auction>

to fiercely fight for whatever remaining spectrum that they still could get. Meanwhile, US operators and the FCC have realized the importance of mid-band spectrum and are now working overtime to get as much of the 3.7-4.2 GHz range released as soon as possible. Furthermore, the often debated CBRS band is now also being considered to deliver 5G, with services currently expected to begin in 2020<sup>17</sup>.

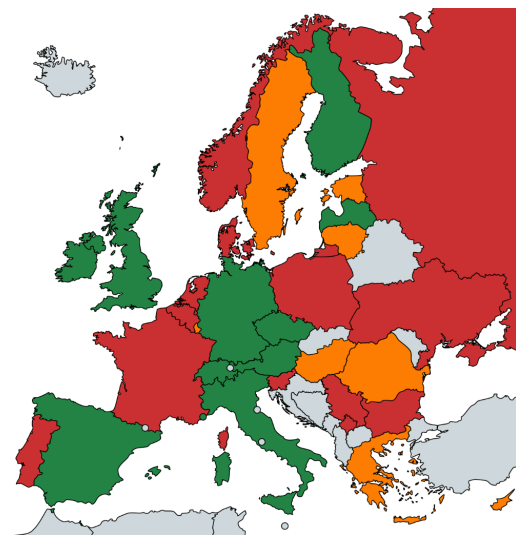


Figure 3<sup>18</sup> European countries by (expected) award time of (some) mid-band spectrum licenses for 5G to MNOs. Green: By Q2/2019; Orange: By end-2019; Red: 2020 and later; Grey: No clear information.

### *Europe risks falling behind*

Northstream believes that the underlying problem in Europe is a structural one and has to do with the different developments of the European vs. the American/Asian markets over the past decades. Because of these inherent structural disadvantages, European MNOs find themselves trapped in a vicious circle which leads them to continuously underinvest in their networks, irrespective of whether those are branded as “5G” or not. As stated before, we believe that it is virtually impossible to make up for a lag in investments in one swoop, which is why the “wait-and-see-strategy” that is frequently applied by regulators and operators in Europe will ultimately lead European mobile networks to be left behind in their development.

In order for Europe not to become too much of a laggard in the race to 5G, policymakers would have to move toward resolving these structural hurdles. Changes in regulatory policy regarding spectrum release and consolidation would be necessary means to improve Europe’s competitiveness vs. the US and Asia in the mid- to long-term.

<sup>17</sup> Source: <https://venturebeat.com/2019/03/20/cbrs-alliance-plans-u-s-5g-service-on-global-3-5ghz-band-in-2020/>

<sup>18</sup> Map created with mapchart.net ©



### 3. 5G rollout pace and impact

#### *Modeling the 5G rollout across seven countries*

In the preceding section, we have discussed how the problems around lower APRU levels and spectrum assignment are leading Europe to fall behind in developing 5G networks when compared to Asia and the US. In order to illustrate what this delay could actually mean in terms of timeline, Northstream has conducted a study in which we have modeled a theoretical 5G rollout on mid-band spectrum<sup>19</sup> in terms of population coverage for the respectively largest operator across seven countries: US, Japan, Germany, France, Italy, UK and Spain. The latter five ones are encapsulated as “EU5”. In the US, we have additionally modeled the case of the future new T-Mobile separately due to Sprint’s extensive 2.5 GHz spectrum holdings.

#### *5G rollout pace across the regions*

For each operator, their available mid-band spectrum, estimated mobile CAPEX budget used for 5G deployment<sup>20</sup>, customer base as well as existing grid have been considered in a scenario in which subscribers consume 50 GB of data per month on average and the minimum end-user speeds to be achieved are 50 Mbps in urban and suburban as well as 30 Mbps in rural areas. Furthermore, based on operator, regulator and auction announcements so far, we have modeled Q3/2019 as starting point for the rollout for Sprint by itself and Q1/2020 as the quarter by which we expect the merger to be completed and thus the new T-Mobile to take over. Q1/2020 has also been set as starting time for Japan as well as for three out of the five EU5 countries. Q3/2020 is assumed for the largest US operator.

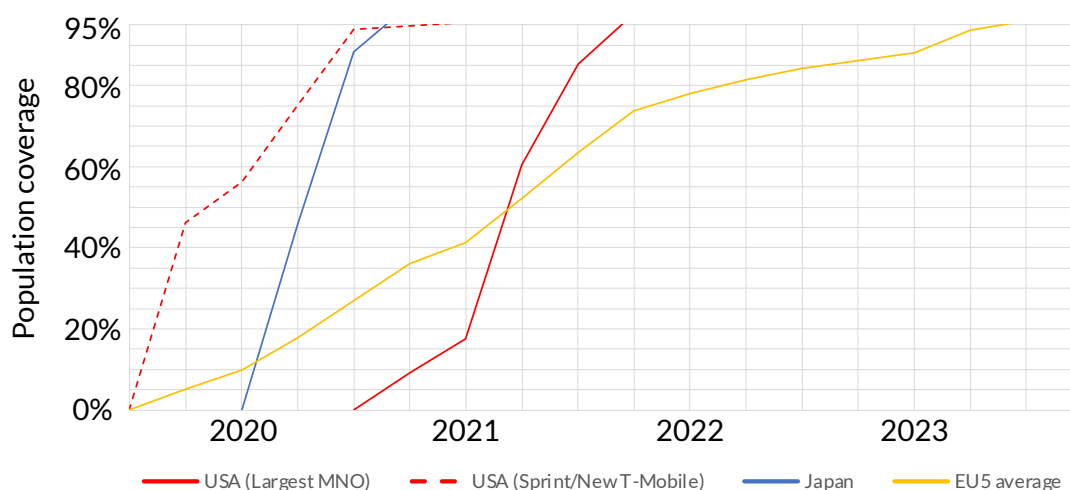


Figure 6 Projected 5G NR roll-out pace on mid-band spectrum

<sup>19</sup> For the largest US operator, it is assumed that until spectrum in the 3.7-4.2 GHz range becomes available, the CBRS band (PAL) will be used for 5G. Furthermore, in the model, the mid-band spectrum is primarily assumed to be used for NR, which is what we believe to eventually happen. This may deviate from current initial deployments (e.g., Sprint) in which much of the spectrum still goes to LTE.

<sup>20</sup> For all MNOs, it is assumed that a maximum of 30% of total mobile CAPEX are spent on this rollout. However, it may be less in actuality, which is why the real-life results in terms of achieved population coverage per MNO/country and quarter may be lower than those calculated by the model.



*Figure 6* above makes it quite apparent that Sprint/the future new T-Mobile is ahead because of their earlier starting time and large amount of mid-band spectrum. It should also be noted that, in the case of Japan, aside from their substantial amount of mid-band spectrum, it is their disproportionately denser existing grid that enables them to deploy at an overall faster pace. One can further observe that the EU5 are eventually slower in covering their populations than the largest operator in the US despite, e.g., the disproportionately higher densification that is required in the US in urban and suburban areas during the initial stages of rollout – which is something that we also have found in our study. Considering that the EU5 in our study are those European countries in which – for the most part – mid-band spectrum has already been assigned to MNOs as of writing this report (see *Figure 5*), it is fair to assume that Europe overall would be further behind than what is visualized in *Figure 6*.

Europe coming in last is related to the aforementioned ability of large US operators to steadily outspend their European peers. We believe that these operators will be more incentivized to invest in this rollout since they would a) not stand idly by as the new T-Mobile rushes too far ahead, b) there is a clear national agenda for the US to be a leader in 5G and c) the ARPU levels in the US have historically been growing (not least driven by the consolidation that was allowed to take place there) while those in Europe have been falling in past years, which gives US operators additional strength to invest and a more positive outlook for the future.

#### *Effects of lagging behind on consumers and enterprises*

Above and beyond the above projection, it is clear that one of the fundamental prerequisites for successfully digitalizing a society is to have a reliable, high-quality mobile network infrastructure in place. While the main contribution of 5G in this regard will – at least initially – be in the form of enhanced mobile broadband (eMBB) as discussed, we expect that more future-oriented use cases based on massive IoT (mIoT) as well as ultra-reliable and low-latency communications (URLLC) will eventually drive ancillary economic benefits. Examples of such use cases can include smart cities, industrial automation, augmented reality as well as remote health and elderly care. For instance, smart cities will include a vast array of applications that will lower costs (e.g., in electricity) for consumers, enterprises and municipalities, as well as boost demand for enabling products such as sensors.

Continuous underinvestment in mobile network infrastructure in the 5G era will eventually lead to many European enterprises getting access to the newest mobile-related technologies and innovations later and

hence restrain their ability to launch new services on a larger scale. As a consequence, consumers in Europe will be able to use the newest offerings later and/or to a lesser extent than their peers in the US and Asia which, in turn, will keep their willingness to pay for those services at an overall lower level. Hence, European MNOs are bound to continue generating lower revenues and the vicious circle starts anew. On top of being placed in a laggard position when it comes to purely mobile broadband-related innovation, European economies will then further be slower in adopting and benefiting from the aforementioned additional use cases.

Ultimately, we would expect these lags to precipitate an unfavorable macroeconomic impact for Europe. Several recent studies have found a positive connection between the adoption of MBB in a country and GDP growth<sup>21</sup>, with results ranging between 0.2% (specifically for OECD countries) to 1.5% in additional GDP growth for every 10% increase in user penetration with MBB. It is a fair assumption to make that eMBB will continue to have at least a similar impact. Thus, with lower overall population coverage limiting the possible end-user adoption of eMBB, European countries are likely to lose out on some potential GDP growth because of insufficiently built-out mobile networks. One can then anticipate that the effect on GDP growth will become even stronger once 5G can enable use cases beyond mere eMBB such as the ones mentioned before.

#### *Europe needs to shape up*

Therefore, the argument as to why it matters where Europe ends up in the 5G race becomes quite a straightforward one. The way things stand right now, the nimbler players in Asia – most importantly South Korea but also Japan – have already started running at high speeds and the US with its stronger leg muscles (i.e., their CAPEX budgets) is warming up and eagerly looking for a pair of better running shoes, namely a sufficient amount of mid-band spectrum. Meanwhile, European players are tied up as if they are running a multi-legged race and only some of them even have any shoes on to begin with. And yet, Europe does show good physicals in the form of relatively dense network grids and the general availability of mid-band frequencies. What it now needs to not fall behind is better coordination and a consolidated team effort. This is where a change in policy-making on the side of the regulators needs to occur in order to facilitate a timely entry of European MNOs into the 5G era.

<sup>21</sup> Sources: Edquist et al., “How important are mobile broadband networks for the global economic development?”, 2018; ITU, “The

economic contribution of broadband, digitization and ICT regulation”, 2018, Northstream internal study.

## 4. Putting Europe on the right track to 5G



### *Mobile networks are similarly important as power grids*

Large-scale connectivity provided by mobile networks can be considered to have become a general-purpose technology as we are entering the 5G era. As such, one should look at mobile connectivity in a similar fashion as one would do with electricity grids or railroads. It has become an essential enabler of economic growth with spillover effects that go way beyond only the mobile or even the broader communications sector. With this in mind, it should become clear that public authorities ought to align the governance and incentivization around network build-out with the larger objective of maximizing macroeconomic benefits.

### *Spectrum and infrastructure policy*

To begin with, the way in which spectrum is currently assigned to operators in Europe is inconsistent. The price of mid-band spectrum in Italy (in USD/MHz/pop) was eight times higher than that in Spain. While mid-band spectrum auctions have achieved prices below 0.10 USD/MHz/pop in, e.g., Spain, Finland and Austria, those in the UK, Germany and Italy have passed that mark<sup>22</sup>.

Thus, some auctions still aim to extract as much money from operators as possible through auction setups which are not seldom problematic when it comes to overall spectrum size or distribution across blocks (cf. *Section 2*). Yet, both of those aspects matter. If disregarded, auctions can result in disproportionately high final prices, as has been seen in Italy and Germany, whose auctions both ended up at roughly EUR 6.6 bn/USD 7.4 bn. Given the fact that the build-out of 5G-

era networks will be a very costly venture as it is, it is counterproductive to squeeze the MNOs further by having them pay overly high prices for spectrum. Furthermore, the coverage obligations associated with the recently concluded spectrum auction in Germany indicate that the priority of European regulators may be pivoting from pure population coverage toward area coverage<sup>23</sup>. This would make an economical network build-out even more of a challenge for operators and thus further elevate the importance of less costly spectrum licenses.

Looking at the US's *5G FAST Plan* for further orientation<sup>24</sup>, it consists of three major objectives: a) making more spectrum available for the operators, b) updating infrastructure policies and c) revamping outdated regulations. On a), it is clear that Europe needs to work toward reducing the variations in mid-band spectrum across the EU member states both in terms of the ranges themselves and the timelines of spectrum assignment. Quite possibly, mandates would need to be moved from the national to the EU level to make this happen. Regulators should generally strive toward releasing all of the spectrum in the 3.4-3.8 GHz range to MNOs as soon as possible, rather than conducting several auctions or withholding chunks of that spectrum for other users. They should also ponder renewing spectrum licenses by default in order to alleviate operator uncertainty about the future. A 2018 study published by French operator Orange found that per-capita CAPEX increases significantly for every

<sup>22</sup> Source: [https://www.lightreading.com/mobile/5g/germanys-euro-6b-5g-auction-should-be-a-break-point-for-telecom/d/d-id/751720?src=lightreading\\_editorspicks\\_rss\\_latest](https://www.lightreading.com/mobile/5g/germanys-euro-6b-5g-auction-should-be-a-break-point-for-telecom/d/d-id/751720?src=lightreading_editorspicks_rss_latest)

<sup>23</sup> This opinion echoes that stated in "Expansive mobile" by Communications Chambers, May 2019. Among other things, the obligations require German MNOs to cover all federal highways and major railroads with at least 100 Mbps by the end of 2022. By the end

of 2024, seaports, important waterways and all remaining highways will also have to be served with 50-100 Mbps.

<sup>24</sup> The following opinions echo those stated in "Expansive mobile" by Communications Chambers, May 2019.

additional year of license duration<sup>25</sup>. In what can be seen as a move into the right direction, the French regulator in the same year decided to reallocate (i.e., without an auction) the licenses across a number of spectrum bands starting from 2021, after current license periods have expired<sup>26</sup>. As for b) and c), potential national, regional and municipal obstacles to deployment need to be taken into account when nation-wide coverage obligations are imposed so as to avoid unnecessary problems for MNOs due to conflicting regulations.

### *New entrants and market consolidation*

Beyond spectrum policy, the low ARPU levels of European operators are likely to continue to restrain their investment options if markets remain unconsolidated and price pressure high. With the conclusion of the German 5G spectrum auction in June 2019, it has become clear that Germany, too, would go back to having four MNOs after having allowed Telefónica Germany to take over competitor E-Plus in 2014.

While letting in a new entrant does increase competition for the benefit of consumers, newcomer 1&1 Drillisch will have to rely on national roaming in areas in which it will not be able to build its own sites. It is also exempt from the relatively challenging coverage obligations that the incumbent operators are faced with. This approach effectively awards spectrum to an entity which will not be able to make full use of it on its own, and furthermore forces the incumbents to concede a major part of their competitive advantage – their existing grids. Instead, a more efficient assignment process would have either granted the licenses solely to such parties who are strong enough to meet the obligations by themselves or imposed the same obligations also on the new entrant, thereby assuring that the awarded spectrum is fully utilized.

Northstream is of the opinion that a policy change on this front is in order. Licenses should primarily be awarded to players who can meet the obligations in the most efficient manner. To foster the creation of such players, we believe that the recently approved merger between T-Mobile and Tele2 in the Netherlands should ideally be followed by further “4-to-3” movements in other European countries. It is our opinion that operators in markets which are characterized by three similarly strong players will have higher capabilities of keeping up with network and general technology investments and will overall be able to generate healthier returns in the long-term. This, in turn, is pivotal in order to assure for a) a high-quality European mobile network landscape and b) low data prices going

forward, both of which will ultimately be for the benefit of the end user. Consumer welfare in the mobile communications and broader digital arena is consequently closely tied to the ability of operators to sustainably invest in new technologies which boost quality and reduce unit prices.

### *Putting Europe on the right track to 5G*

With the advent of 5G, mobile communications will evolve into a general-purpose technology that will impact the relative competitiveness of national economies. To ensure further economic growth, timely and continuous investment in mobile network infrastructure is imperative so that innovation can occur and consumers, enterprises and also governments (that is, through increased tax revenues) benefit. In Europe, regulators and policymakers on both the national and EU level need to play their part by implementing policies that facilitate the build-out, maintenance and upgrading of mobile networks. In more concrete terms, we call on authorities to act on the following:

- Increasing cross-country coordination to accelerate and tighten the time schedule for spectrum releases
- Updating spectrum assignment processes to reflect the financial pressure on European MNOs and provide them with incentives to invest
- Re-evaluating the regulatory policies to balance between pro-competition and pro-growth/quality measures

If these efforts are successful, the resulting macroeconomic benefits of 5G will be significant and will play a key role in enabling Europe to attain and retain a competitive position as a global innovation hub in the future.

<sup>25</sup> Source: <https://www.orange.com/fr/content/download/46429/1361572/version/4/file/license-mobile-investment.pdf>

<sup>26</sup> Source: <https://www.arcep.fr/actualites/les-communiqués-de-presse/detail/n/new-deal-mobile-4.html>





## ABOUT NORTHSTREAM

Northstream is a boutique consulting firm dedicated to serve domestic and international clients. We have put our competence, passion and efforts at the intersection of business and mobile technologies, providing strategies handcrafted for each client's unique business and competitive dynamics. We are proud to say that we come highly recommended by many of the most successful players in the ecosystem of a connected world. We typically work with:

- Business strategy development and planning
- Technology and product assessment
- Strategic sourcing of systems and services
- Reorganization and transformation
- Market analysis and due diligence

Northstream was founded in 1998. With our common cultures of collaboration and client-centricity, we are a dedicated team of industry professionals partnering with our clients to deliver transformative outcomes for a new digital world.

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