Belgian Institute for Postal Services and Telecommunications

Impact study of 26 June 2018 regarding a fourth mobile network operator on the Belgian mobile market

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INTRODUCTION

1. The Belgian government wishes to maximise consumer welfare, in terms of price, quality and diversity of the supply in the telecom market. The government intends to take the most suitable measures to achieve this goal.

2. To that end, Vice-premier Alexander De Croo requested the BIPT, in a letter received on 15 June 2018, "to draw up a report on the status quaestionis of consumer welfare in the Belgian telecom market".

3. In his lettrer, the Vice-premier asked the following in particular:

   "The report should also provide a summary of the major difficulties regarding consumer welfare and of any possible measures to solve them. It is also important to identify the advantages and disadvantages and the side-effects of the various measures. The government wishes to understand the pros and cons of the various measures."

   "The report should provide a clear answer as to how the government can provide spectrum, in the very best possible way, for the benefit of users (consumer welfare maximisation) and, in particular, address the organisation of the auction and the telecom sector."

4. This report answers the above-mentioned requests. It investigates whether allowing the entry of a fourth operator in the Belgian mobile telephony market, by allocating additional spectrum, might have positive, and possibly negative effects on competition in that market.

5. Therefore, this report focusses on the government's request, based on the once-only possibility[1],offered by the spectrum policy, of allowing a new player to enter the market.

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1 A spectrum auction such as is now on the table, will not take place again in the next 20 years, given the fact that licences have a duration of 20 years and that there is little or no more room within this period for a redistribution of the spectrum portfolios. It is therefore impossible or very difficult to enter the market via spectrum within this period, unless the operators were to voluntarily trade spectrum.

6. It should be emphasised that the potential entry depends on the mechanisms of the mobile telephony market. Therefore, the government does not get to decide on the entry of a new player on the market. The spectrum policy restricts itself purely to the creation of opportunities in this market, in a context in which a level playing field is ensured by the way spectrum is allocated.

7. Furthermore, this report is not a general analysis of the telecom market and of all the possible measures to maximise consumer welfare. This would certainly require a much more extensive study. Several aspects of this matter have already been explicitly studied in the various analyses regularly carried out by BIPT (in cooperation with the Community regulators for media)[2].

8. The following is therefore a study on the relevant aspects of the Belgian mobile telephony market, including the competitive dynamics, the possibility to allocate additional spectrum and the possible impact of a fourth mobile network operator. Where this affects these questions, the impact on associated markets is also taken into consideration.

2 See, for example, the recent proposal of the CRC market analysis for the broadband internet and television broadcasting markets, by CRC. http://www.bipt.be/en/operators/press-release/161-notification-by-the-crc-to-the-european-commission-of-draft-decisions-regarding-the-broadband-internet-and-television-broadcasting-markets

Press release, 29 May 2018: "The European Commission authorises the CRC to finalise the analysis of the broadband Internet and television broadcasting markets", http://www.bipt.be/en/operators/press-release/162-the-european-commission-authorises-the-crc-to-finalise-the-analysis-of-the-broadband-internet-and-television-broadcasting-markets

1. DYNAMICS IN THE BELGIAN MOBILE MARKET

10. There are both MNO operators (Mobile Network Operator) and MVNO operators (Mobile Virtual Network Operator) active in the mobile market. An MNO has its own radio access network and spectrum licence. There are three mobile operators in Belgium: **Proximus**, **Orange Belgium** and **Telenet Group**[3]. These three operators have each rolled out three technologies: 2G, 3G and 4G[4].

11. An MVNO does not have its own network, as opposed to an MNO. MVNOs are therefore dependent on the network of one of the three MNOs. The most advanced MVNOs (known as "Full MVNOs") do have their own fixed network elements, but not their own radio network. Consequently, they are able to significantly differentiate their services from those of the operator whose network they are using. This means they can strongly influence the market's competitive dynamics.

12. Since Telenet's take-over of BASE, Lycamobile is currently the only remaining full MVNO of any significant size[5]. In 2017, this category of full MVNOs represented a market share of 4.8% of the number of SIM cards. In addition, there are another ten light MVNOs and mobile service providers taking a market share of 7.5%[6].

3 Telenet provided mobile services until 2017 over Orange's network (formerly Mobistar) as a full MVNO. On 3 February 2016, Liberty Global, owner of Telenet, received approval from the European Commission to take over mobile operator BASE. Telenet became then an MNO. The sale of MVNO Mobile Vikings to Medialaan was then a condition to ensure competition in the Belgian market.

4 A summary of the history of the allocation of mobile licences is shown in Annex 1.

5 By the end of 2017, Lycamobile had achieved a total of 571,051 active SIM cards. There are also smaller full MVNOs on the market, such as Vectone Mobile and Join Experience. From 2019, Medialaan will also function as a new full MVNO (see marginal15).

6 BASE Turk, Belgian Telecom, Carrefour Mobile, EDPnet, Ello mobile, L-Mobi Mobile, Scarlet, Dommel, United Telecom, Voo and Transatel.

1.1 Market shares and convergence

13. The table below shows the evolution of the market shares of the various MNOs and full MVNO Lycamobile[7].

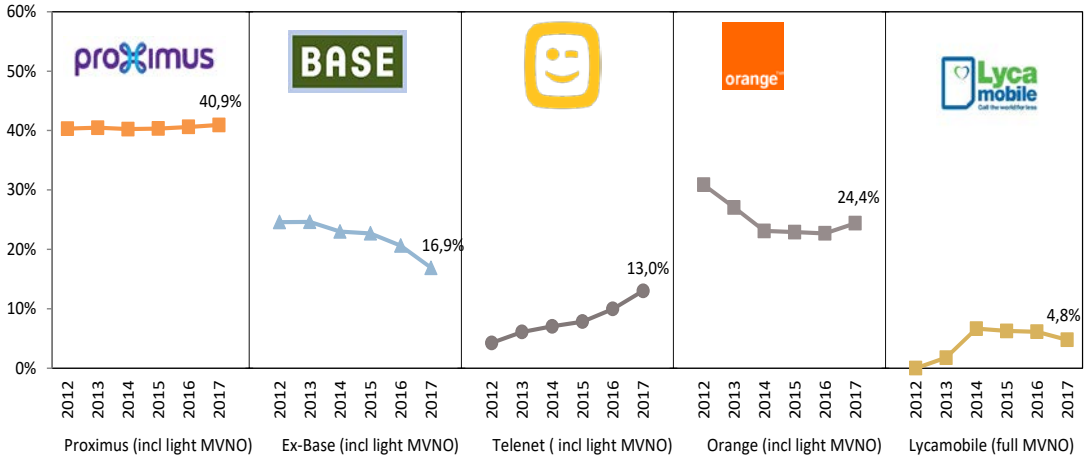


Figure 1: market shares in the mobile market based on SIM cards (source: BIPT)

14. Based on the number of active clients, Proximus is the market leader with a market share of 41%. BASE/Telenet follows (joint market share of 30%) and then Orange Belgium (24.4%). In terms of turnover, Proximus has a market share of 44%, Orange 31% and Telenet 25%. It should be mentioned here that the impact of the BASE/Telenet merger will not be fully felt until early 2019.

15. From 2019, Medialaan will also function as a new full MVNO. Their roughly 365,000 clients[8] will then migrate from BASE's network to Orange Belgium. This will give Medialaan, as a future MVNO, a virtual market share of 3%, in terms of number of active clients.

16. The aforementioned evolution of market shares therefore shows that there was an initial increase to be seen in recent years in the competitive dynamics. Full MVNOs

7 The market shares of BASE and Telenet are given separately for the clarity purposes. Up till 2017, Telenet was a full MVNO (on Orange's network) and BASE was an MNO. The takeover of BASE by Liberty Global made Telenet an MNO, and BASE now only a brand name.

8 Medialaan provides the mobile brands Mobile Vikings and Jim Mobile.

such as Telenet have acquired a significant market share since the arrival in the market of the mobile offer “King & Kong” in 2013. This caused the rather high prices for mobile data to drop (see section “*1.3 Price evolution on the mobile market*”).

17. A consolidation is currently taking place. Due to its takeover of BASE, Telenet will become the second largest MNO in terms of number of SIM cards, but remains the third operator in terms of turnover. Following this takeover, the market share of full MVNOs will fall from 15.3% to 4.8%.

18. Moreover, further consolidation cannot be ruled out. Telenet has already started the acquisition of operator SFR, which provides fixed broadband and broadcast services in the Brussels Capital Region.. Telenet has also reached an agreement with VOO, the brand under which the Walloon intermunicipal company Nethys and network operator Brutélé market their telecommunication products. To this day, VOO has been providing its mobile services over Orange's network. Thanks to this agreement, the Walloon brand will provide its mobile service from 2019 over Telenet's network. This will result in an estimated 200,000 mobile clients migrating from Orange's network to Telenet. A complete takeover of VOO by Telenet and/or Orange cannot be ruled out either. Both Telenet and Orange have already publicly shown their interest in such a takeover.

19. The market for telecommunications services is characterised by an increasing convergence. The end user purchases more and more different telecommunications services within the co-called multi-play offers or 'packs'[9]. This increases the popularity of multi-play products with mobile components. In 2017, "quadruple-play offers" (broadband, television, fixed telephony and mobile services) represented 29% of service sales, versus only 4% in 2012.

9 Bundled products combining mobile products are sold together with other telecom products (broadband Internet, television and/or fixed telephony) by the same operator.

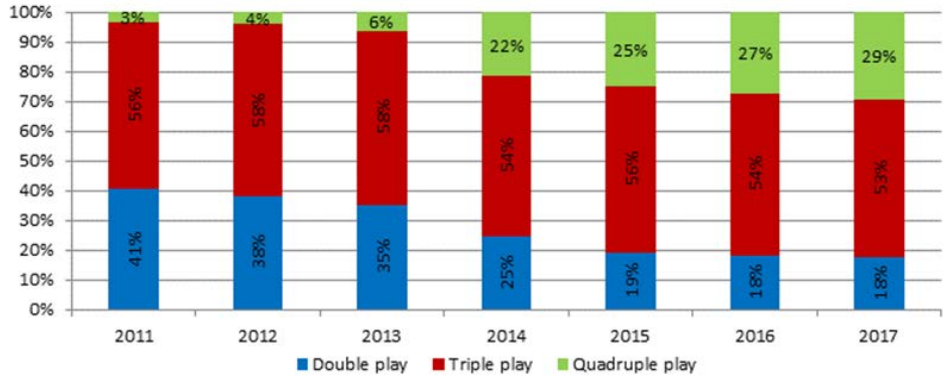


Figure 2: share of fixed broadband subscribers with broadband in a bundle (source: BIPT)

20. However, it should be noted that, despite this increasing trend towards bundled offers, mobile telephony is still largely purchased alone: 71% of clients purchase mobile telephony separately. Concerning other telecommunications products, such as broadband Internet and broadcasting services, for example, the trend towards bundled offers is further developed, as shown in the figure below. This means that the evolution towards bundled products is only just beginning, concerning telephony, and that it will further develop in coming years.

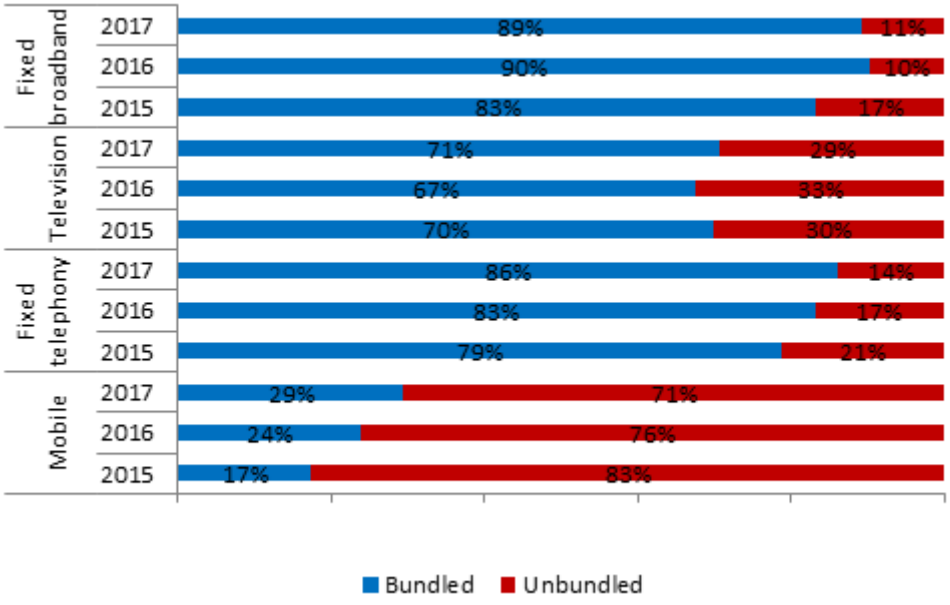


Figure 3: share of clients for bundled and separate services among the total number of clients for various telecom services (source: BIPT)

21. The volume of SIM cards sold in a bundle with a fixed service grew by 36.4% in 2017, from 1,614,706 clients to 2,202,673 clients. The major part of the net growth

of around 588,000 was realised by BASE/Telenet (58%). Orange's share of the net growth was 30% and Proximus grew by 12%.

22. That means that Telenet achieved the biggest increase for these products, increasing its market share for bundles with a mobile component by 8 percentage points to 19%. Thanks to its entry in the fixed markets for broadband Internet and broadcasting[10], Orange achieved a market share of 8%.

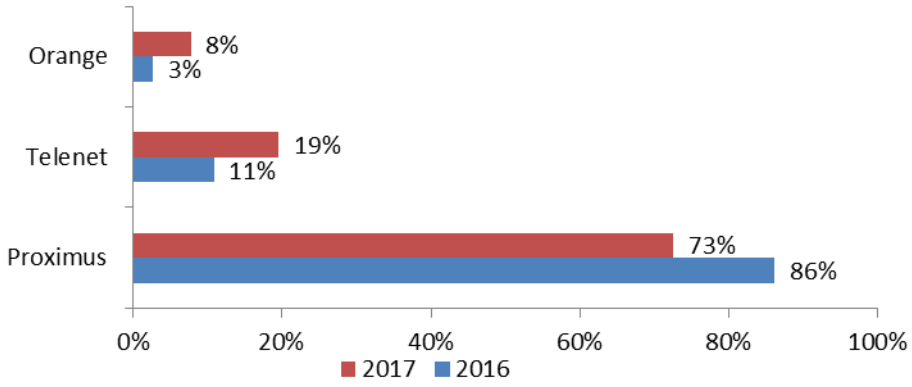


Figure 4: share in the volume of residential bundles combining fixed and mobile services (2-play, 3-play and 4-play bundles with a mobile component) (source: BIPT)

23. This increasing popularity of multi-play offers among end users is making it necessary for mobile operators to offer bundled products in order to remain competitive in the mobile market. To illustrate this, Annex 3 contains a few examples of commercial strategies making it more difficult for operators offering only mobile products (mobile-only players) to compete in the end user market for mobile telephony.

[10] Orange provides these fixed products via the regulated offer on Telenet's network; see also section "*3.1.2 Market regulation in the related* wholesale markets".

24. Getting access to the associated fixed networks is therefore essential to mobile players. Only Proximus and cable operators Telenet and VOO[11] have a fixed network at their disposal. Without regulation of these networks for fixed products, it is likely that a mobile operator who has no fixed network will no longer be able to offer combinations of fixed and mobile products. The existing and future regulation of these associated fixed wholesale markets is therefore extremely relevant for competitiveness on the mobile market. It will be further discussed in section "*3.1.2 Market regulation in the related wholesale markets*".

1.1.1 Conclusion market shares and convergence

25. The mobile market is characterised by competition through infrastructure between three mobile operators. The Belgian mobile market is therefore not characterised by significant competition problems. Up till now, the MNOs have made commercial access agreements with the MVNOs.

26. There is however a consolidation movement going on. The merger between Telenet and BASE has meant the disappearance of an important full MVNO, which represented between 8% and 10% of the market, and which had made the market more dynamic with its entry.

27. In addition, the mobile telephony market is characterised by a rising convergence, in which mobile telephony is increasingly purchased in a bundled offer, together with broadband Internet, fixed telephony and/or broadcasting products. Access for mobile operators to the associated fixed networks (whereby only Proxiums and cable operators Telenet and VOO have a fixed network at their disposal) is therefore necessary if mobile operators are to remain competitive in the mobile market.

1.2 Churn and ARPU

28. The **churn** observed, the percentage of the average number of disconnected SIM cards, amounted to 18.4% of the average number of SIM cards in 2017[12]. This is a

11 VOO is the brand under which network operators Nethys and Brutélé market broadband Internet and broadcasting products. VOO also acts as an MVNO, over Orange's mobile network. In 2019, this mobile product will be provided over Telenet's mobile network.

12 The mobile churn rate is calculated as the percentage of the number of SIM cards disconnected from the mobile network annually, compared to the average number of active SIM cards for the same period.

slight rise compared to 2017[13]. This churn is significantly higher than that of broadband Internet services (8.5% in 2016)[14] and of multi-play offers.[15] The higher churn can be explained by lower switching costs for mobile telephony. For example, when switching broadband Internet services, a change of modem is needed.

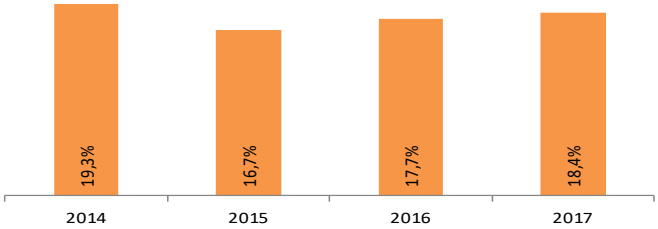


Figure 5: churn rate SIM cards (source: BIPT)

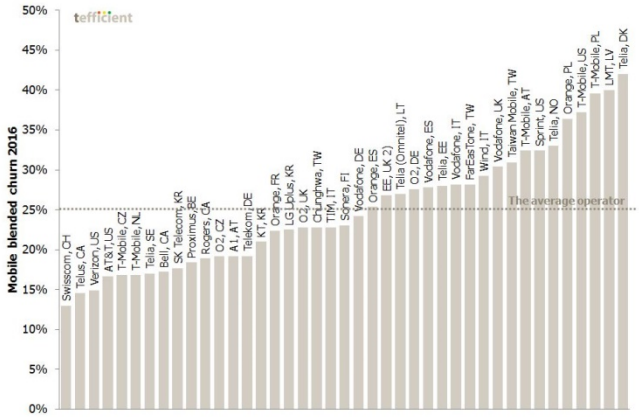


Figure 6: churn comparison between European operators (source: Tefficient – March 2017)

13 It is worth noting that both prepaid (subject to stronger fluctuations) and postpaid SIM cards are included in this calculation.

14 Source: operators data, BIPT

15 An average of 12% of the households that purchased unbundled services cancelled these services in 2016. The frequency with which 2-play households cancel services is, with 11%, lower than for the households that purchased unbundled services. Regarding triple-play and quadruple-play, the churn rate is the lowest, at 8% and 5% respectively.

29. The average yield per client from mobile retail services, the mobile ARPU, has remained relatively stable in recent years. It slightly rose , from 17.4 to 17.7 euros per month for Proximus and Telenet/BASE in 2017, due to an increase in use.

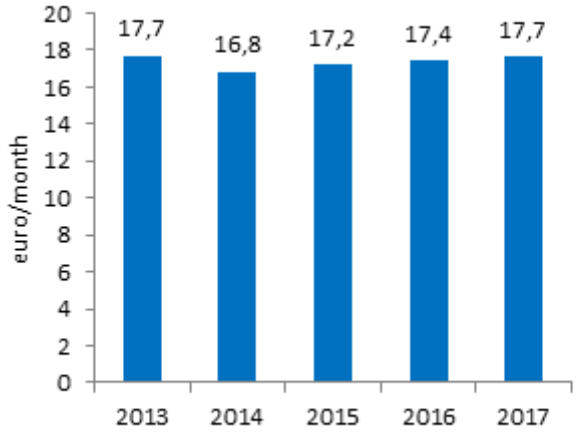


Figure 7: mobile retail ARPU per month, not including interconnection (source: BIPT)

30. A report drafted by BEREC[16]reveals that the ARPU in the Belgian mobile market is higher than the European average (by a little more than 3 euros), in line with that of the Netherlands and between that of Germany (lower ARPU) and France (higher ARPU). The figures below show that there is no clear-cut connection between the level of the ARPU in a market and the number of mobile operators in that market.

16 International Roaming BEREC Benchmark Data Report April 2017 - September 2017

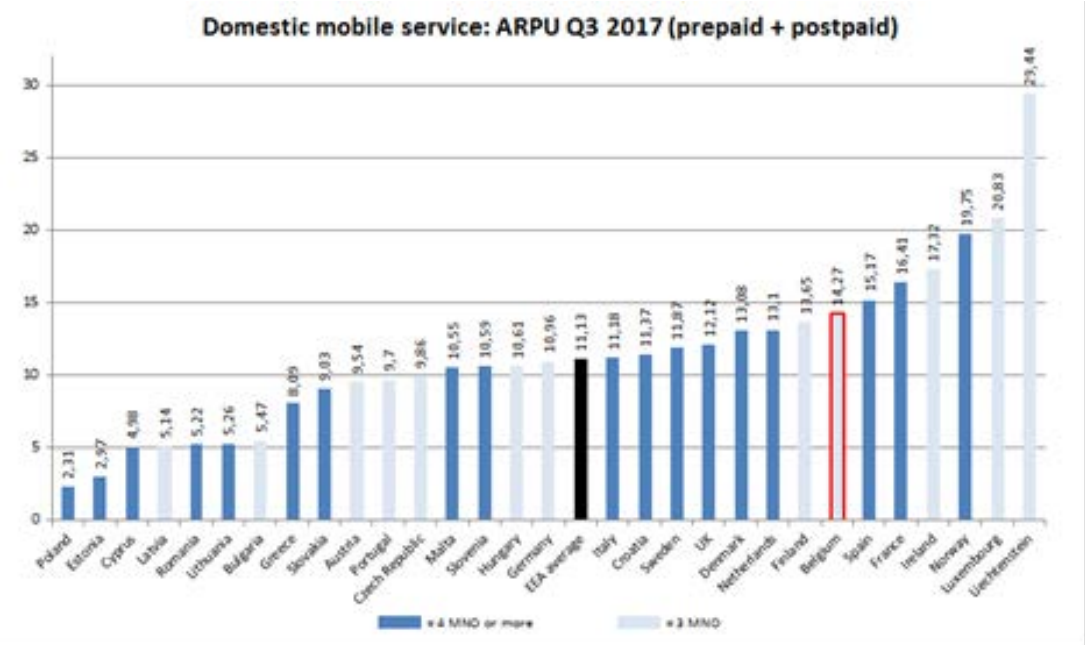


Figure 8: comparison mobile ARPU in EU (source: BEREC)

31. The average yield per user has remained stable in recent years and is in line with that of our neighbouring countries, despite the presence of a fourth operator in the Netherlands and France. It is important to mention that not only the price effect, but also the volume effect, is relevant to the level of the ARPU.

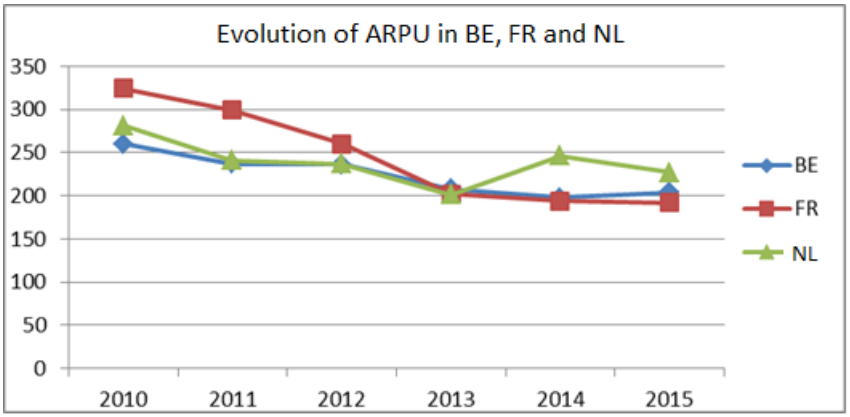


Figure 9: ARPU evolution in Belgium, France and the Netherlands (source: European Commission)

1.2.1 Conclusion Churn and ARPU

32. The churn for mobile telephony is greater than for other telecommunications services such as broadband Internet and bundled products. This is an indication that mobile clients switch providers more easily. The higher churn can be explained by lower switching costs.

33. The average yield per user has remained stable in recent years and is in line with our neighbouring countries.

1.3 Price evolution on the mobile market and international price comparison

1.3.1 Price evolution in Belgium

34. Prices of mobile telephony services in Belgium have been showing a downward trend for many years and across all profiles, as illustrated in the graph below (-16% compared to Jan. '14)[17]. This is in contrast to the price evolution of the fixed products, in which the price rise is significantly to substantially higher than the evolution of the general consumer price index. However, prices of mobile telephony services stabilised in the period from mid-2015 to mid-2017.

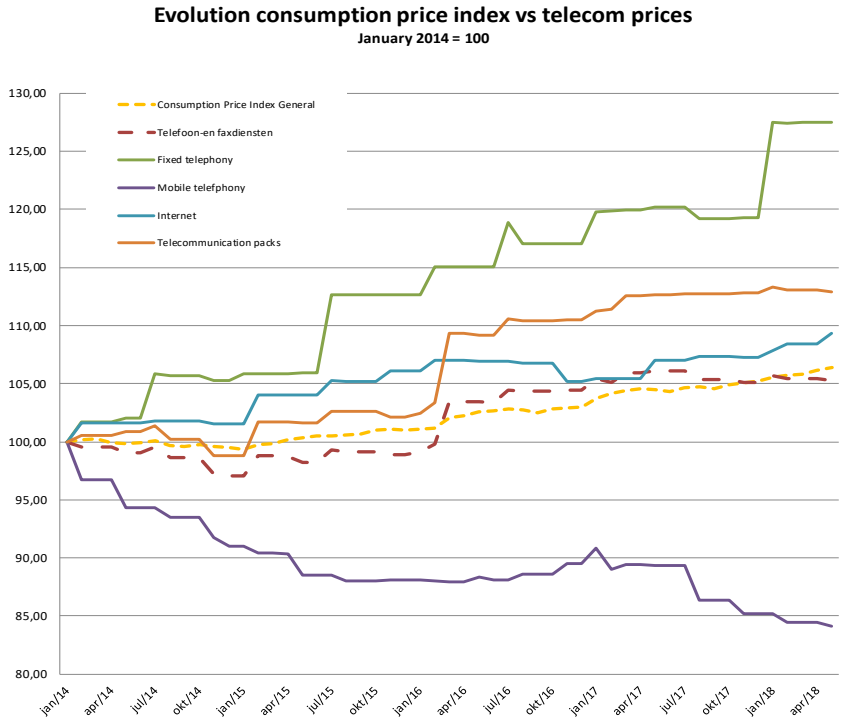


Figure 10: price evolution in telecom compared to the consumer price index (source: FPS Economy, Price observatory)

17 Since 2006, prices of mobile services in Belgium have fallen by roughly 60%.

35. In the period from January 2014 to May 2018, prices in the Netherlands and Germany fell by 45% and 6% respectively[18]. The current price level in France is more or less the same as it was in 2014. However, since 2012, the year in which a fourth mobile operator entered the market, the price level in France has fallen by 27%. The biggest fall was in 2013, compared to 2012.

36. Based on BIPT's international price comparison study (see below), it is reasonable to conclude that the prices of profiles with a data component of 1 or 2 GB are characterised by a downward trend in Belgium and the neighbouring countries. The costs linked to a profile with a usage of 1 GB data have fallen more significantly in Belgium since 2012 than in neighbouring countries. Compared to 2016, the Belgian prices for the profile in question have however risen again by 19%.

37. The costs of a profile including a usage of 2 GB data have fallen less significantly in comparison (certainly compared to the situation in Germany), which has led to a deterioration of our country's position. Belgium's ranking has consequently fallen from the penultimate position in 2016 to the last position in 2018[19].

18. Source: Eurostat. The method used to calculate the index figures varies from one country to another. Since 2014 in Belgium, for mobile telephony, the most consumed products per profile and per provider are considered. The actual client numbers and migration percentages from old to new tariffs are also used in Belgium. This means that the method used in Belgium is more in line with the consumer's actual expenditure.

In the Netherlands, only the tariffs of new, still to be taken out, subscriptions are monitored, whereby the cheapest rate is considered, in principle (taking into account the duration of the contract). In France too, the cheapest rate per profile and per client is monitored. In these neighbouring countries, it is assumed that the consumer will immediately switch to cheaper tariff plans. The fall in Germany is measured against the year 2015, since there are no records for that country from before that time.

19 It is worth noting that this study does not take into account any offers serving a restricted client base, which could be less expensive. However, their extremely limited market share makes their effect on the general price level negligible.

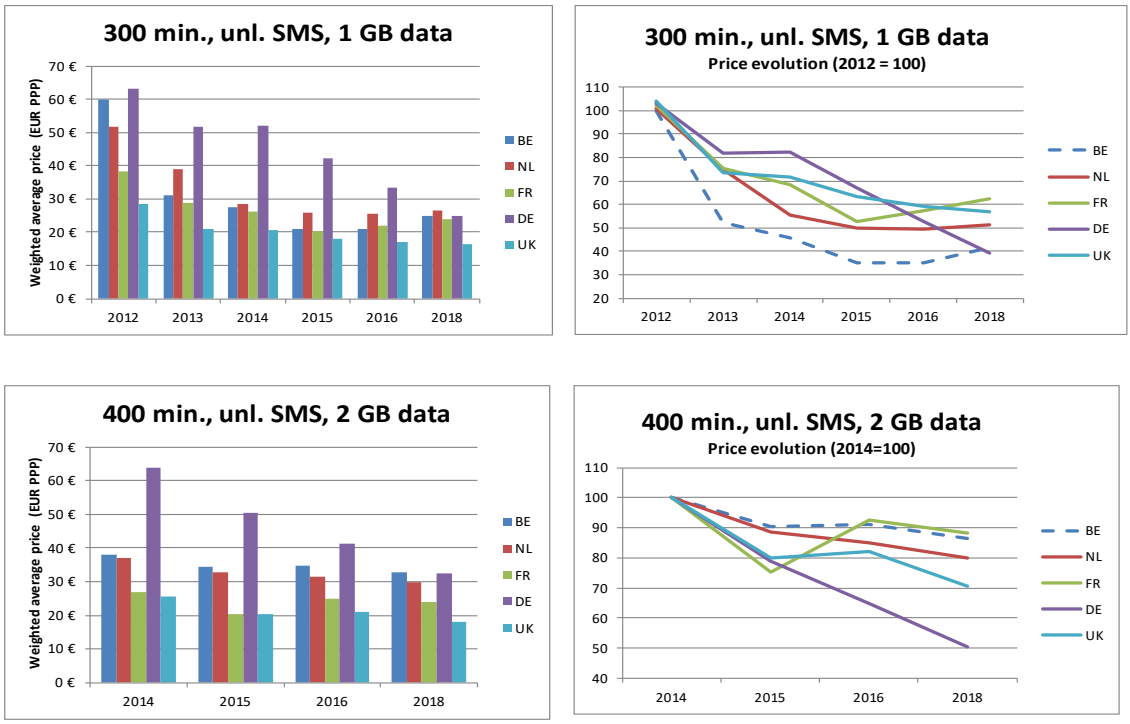


Figure 11: mobile offers compared by profile to neighbouring countries (source: BIPT benchmark price study - data June 2018)

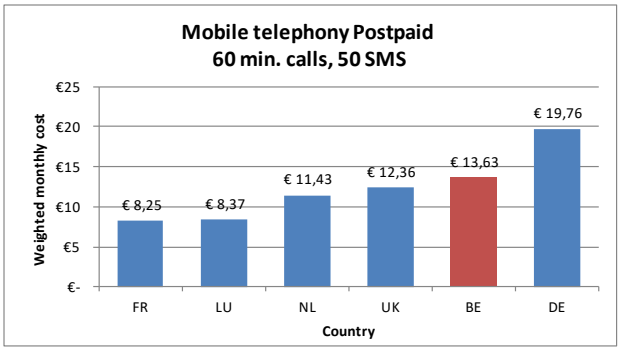
1.3.2 International price comparison

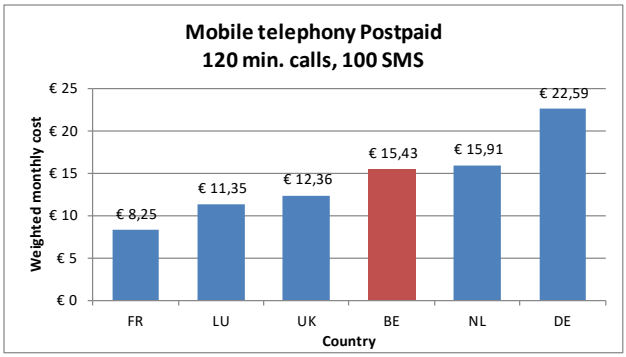
38. A benchmark study, in which the BIPT compares Belgian postpaid tariffs with those of neighbouring countries[20] reveals that as far as 'light profiles' (characterised by no or very low data use) are concerned, Belgium is in third or fourth place in the group of six countries that were the subject of the analysis. Belgium is the second most expensive country when it comes to the very lightest profile.

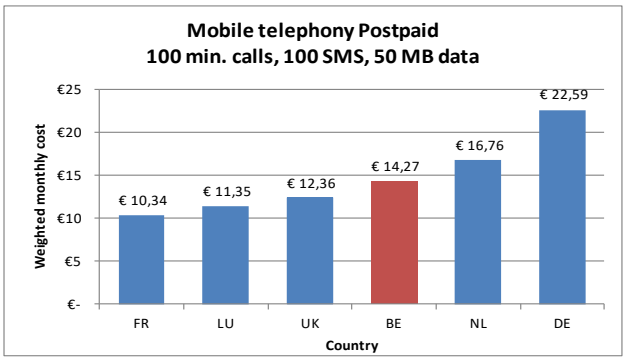
39. Concerning the heaviest profiles, with a data component of 2 GB and 10 GB (which has only been included in the analysis since 2018), Belgium is at the last and penultimate position in the ranking, as illustrated in the graph below. For the profile with a data component of 1 GB, Belgium joins the Netherlands and Germany in the group of countries in which the price is significantly higher than in the other

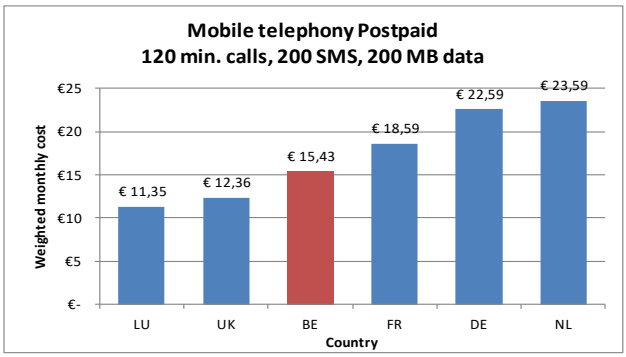
20 Data collected in June 2018. Results calculated according to the method used in the BIPT's benchmark price study as applied in the period 2012-2016.

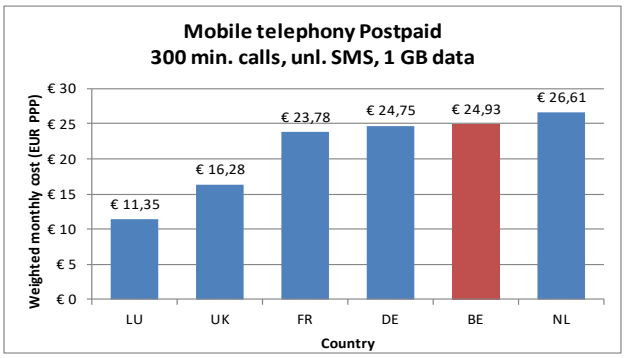
two frontrunners. Belgium is the penultimate country for this profile. The prices per country in the BIPT comparison are based on the average of each operator's cheapest tariff plan, weighed according to their market share. A PPP [21]correction was then applied. The figures below show the results per country for each profile.

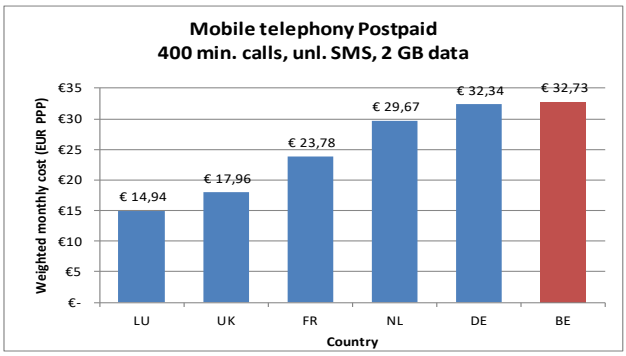












21 Purchasing Power Party, a benchmark which compares purchasing power between countries.

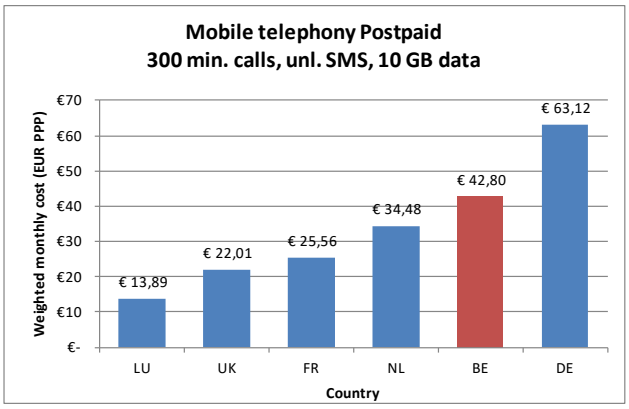


Figure 12: price comparisons with neighbouring countries in the mobile market (source: BIPT)

40. The "Mobile Broadband Prices in Europe 2017" study, based on data collected in February 2017 and commissioned by the European Commission, shows that as far as mobile telephony with a data component is concerned, Belgium is significantly cheaper than the EU-28 average for the two lightest profiles with data components of 100 and 500 MB. For baskets with a data component of 1 to 2 GB, the price level in our country is roughly the EU-28 average. This study takes only into account the cheapest offers in the market and only from the 3 main network operators.

41. The table below gives an overview of the selected Belgian offers as compared to the EU-28 average. Since this study compares only the cheapest offers per country in a certain cluster, it is less representative of the market as a whole. This can be seen in the figure below, in which not a single offer by Proximus appears, even though this operator has the largest market share. The result of the study is a snapshot, based on tariff plans that were in place in the first quarter of 2017. Since then, new products are available in the fast-evolving mobile market which contain larger, or unlimited, data components.

Basket	Price in EUR/PPP (VAT incl.)	EU28 average	Difference with EU average	Offer
Basket 1: 100MB and 30 calls	7,49	14,11	-47%	Orange Colibri
Basket 2: 500MB and 100 calls	13,64	17,62	-23%	Base 15
Basket 3: 1GB and 300 calls	23,00	23,62	-3%	Base 25
Basket 4: 2GB and 900 calls	30,88	31,39	-2%	Orange Panthère
Basket 5: 2GB and 100 calls	23,00	23,93	-4%	Base 25
Basket 6: 5GB and 100 calls	30,88	31,80	-3%	Orange Panthère

Figure 13: selected offers from data set for Belgium in comparison to the EU-28 average in 2017 (source: European Commission)

42. The numbers below can also be derived from the study commissioned by the European Commission. It shows Belgium's position compared to neighbouring countries. Regarding the heavier profiles, Belgium positions itself as being relatively expensive compared to those same countries.

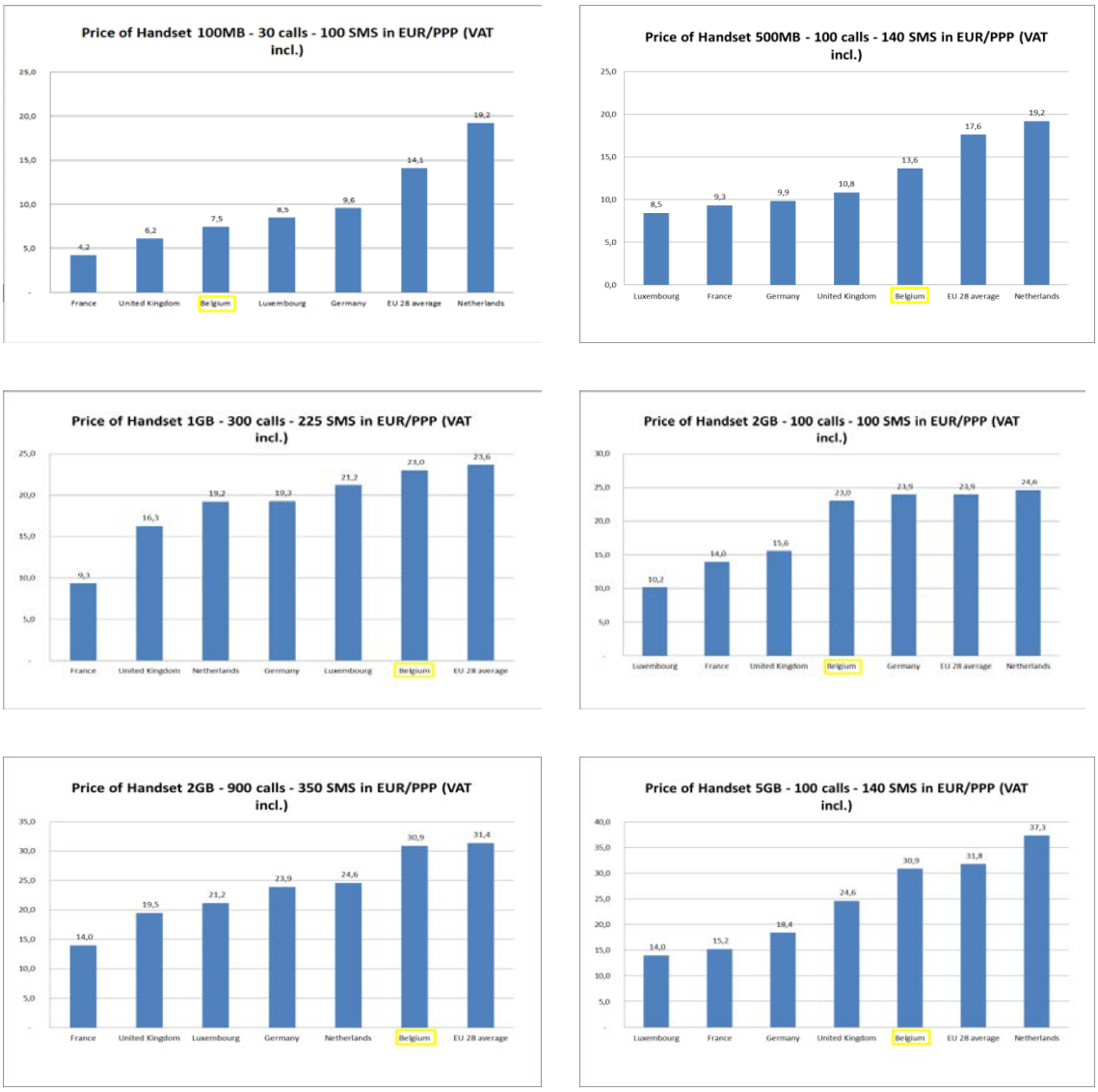


Figure 14: selected offers from data set for Belgium in comparison to the EU-28 average in 2017 (source: European Commission).

43. The OECD also carried out an international benchmark price study concerning mobile telephony and Internet[22]. Belgium was ranked most expensive for all three profiles studied (low, medium and high). It should be noted that the three profiles contained an extremely heavy telephony component, bearing in mind that multiple minutes are charged per call (between 2 and 8 minutes, depending on the destination). The absolute amounts can therefore be higher per country than in other studies. This OECD price comparison is further discussed in Annex 6.

44. Despite a fall in unit prices for data in recent years, Belgium is still lagging in the field of offers with high data allowances. It is therefore hardly surprising to see that the price per gigabyte (price/GB) in Belgium is one of the highest in the European Union.

45. This does mean that the Belgian mobile operators still have enough room for growth towards offers of 'unlimited data' and have the opportunity to compete in this area with other operators. The Dutch telecom regulator ACM confirmed in early 2018 that offers of unlimited data seem to strengthen competition in the mobile sector, and also that the growth of mobile data use in the Netherlands is speeding up[23].

1.3.3 Conclusion of the price analysis

46. In general, prices of mobile telephony services have been showing a **downward trend** in Belgium for years now, as they have in many other European markets. Despite this downward trend in prices, Belgian prices are not always low in an international context, not least where consumption profiles containing a heavy data component are concerned. There is certainly room for Belgian operators to grow towards offers with a very heavy data component or 'unlimited data'.

47. However, based on the **BIPT study**, it appears that Belgium is positioned as **average to rather expensive**, compared to **neighbouring countries** as far as the **lighter profiles** are concerned (those with no, or a relatively limited data component). Concerning the **heaviest profiles** with a data component of 2 GB and

22 OECD (Organisation for Economic Cooperation and Development), Mobile broadband basket http://www.OECD.org/sti/broadband/broadband-statistics/. For Belgium, these consist solely of the tariff plans of Proximus and Orange, which makes the result less representative compared to the BIPT and EU studies.

23 https://www.acm.nl/en/publications/accelerated-growth-mobile-data-consumption-unlimited-data-plans

10 GB, Belgium occupies the **last and penultimate position** in the rankings of the six benchmark countries (closely followed by Germany). In the context of this study, the results were determined on the basis of the average of the cheapest tariff plan of each operator, weighed according to their market share, what aids representativeness. The conclusion of this BIPT study, regarding prices, has the biggest influence on the manner prices should be evaluated.

48. The "Mobile Broadband Prices in Europe 2017" study determined in a **broader European context** that Belgium comes out as cheap in the lightest profile category. Concerning the consumption baskets for mobile telephony with a data component of 1 to 5 GB, our country positions itself around the EU-28 average. This study takes only the cheapest offer of the market, per country, into account. It can also be deduced from this report that Belgium, concerning heavier profiles, positions itself as being relatively expensive compared to the neighbouring countries.

49. Belgium was ranked most expensive for all three profiles studied (low, medium and high) in the OECD study. It took account of only the tariff plans of the two largest operators in each country.

1.4 Qualitative aspects

1.4.1 Coverage

50. Concerning LTE[24] coverage, Belgium scores excellently with a third place. Although Belgium dangled around the middle group until not so long ago, it has risen in just a few years to be one of the frontrunners in Europe.

24 Long Term Evolution, the fourth generation of mobile Internet.

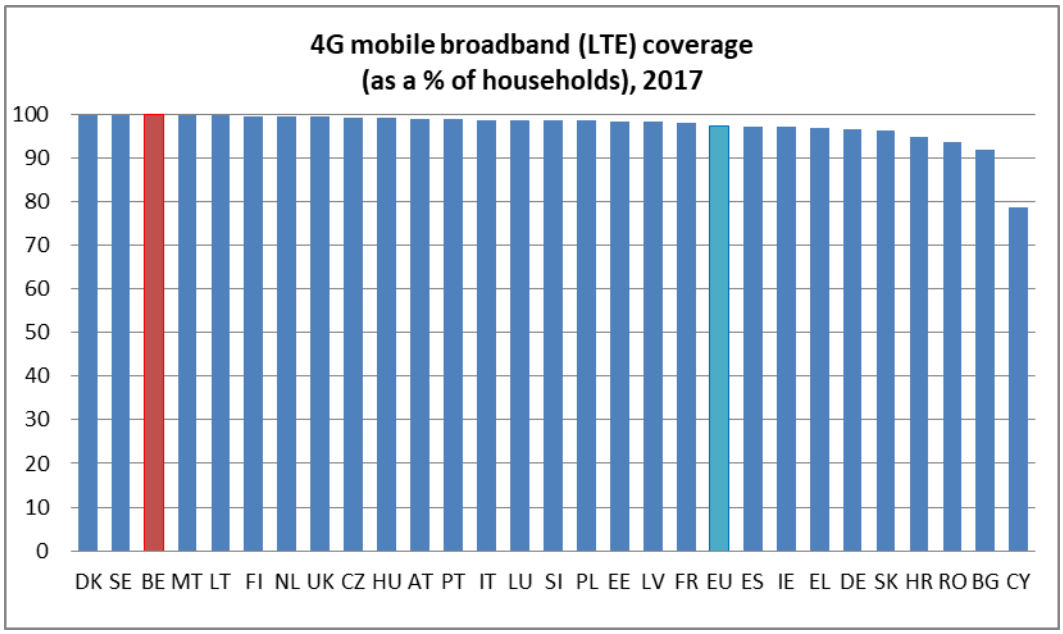


Figure 15: 4G mobile coverage per country (source: European Commission, Digital Agenda Scoreboard, key indicators)

51. Combined with three strong results in terms of percentage of fast to very fast connections, on the basis of the fixed networks, this good 4G coverage puts Belgium in third place in Europe concerning the "connectivity" aspect of the DESI.

52. In recent years, the operators have made substantial investments, stimulated partly by the transparency measures carried out by the regulator regarding the quality of the networks and partly by the effective spectrum management, in particular the management of the 800 MHz band. For example, Telenet was obliged to catch up in the last two years, after BASE had put investments low on the agenda for some years.

1.4.2 Speed and quality

53. The three Belgian mobile operators are calling upon the Commsquare company to carry out tests along the road, to compare the quality of client experience with their networks. Among the quality indicators measured are the percentage of uninterrupted calls, the average download speed, the average transmission speed and the percentage of streaming videos that can be watched without interruption.

54. The graphs in Annex 5 illustrate the experienced quality with the three Belgian operators, compared to that established in the French market, where there are four mobile operators[25]. These studies of the experienced quality in Belgium showed a high level of quality. Unlike France, the regulator in Belgium has not yet carried out these studies. Nevertheless, the three operators are calling upon the same company and the regulator will organise a measurement campaign along the road, aided by this company around September 2018.

55. The results are confirmed by a study carried out by OpenSignal[26], which identified Belgium as a country with both good download speed and good coverage, compared to other EU Member States. The same OpenSignal study shows in the graph below that the latency on Belgian G4 networks is lower than in other Member States. The lower the latency (the speed of response to setting up a connection), the better the network. This will become even more important in the future, with the rolling out of 5G networks (see section "*2.2 Future technological evolution of 5G*").

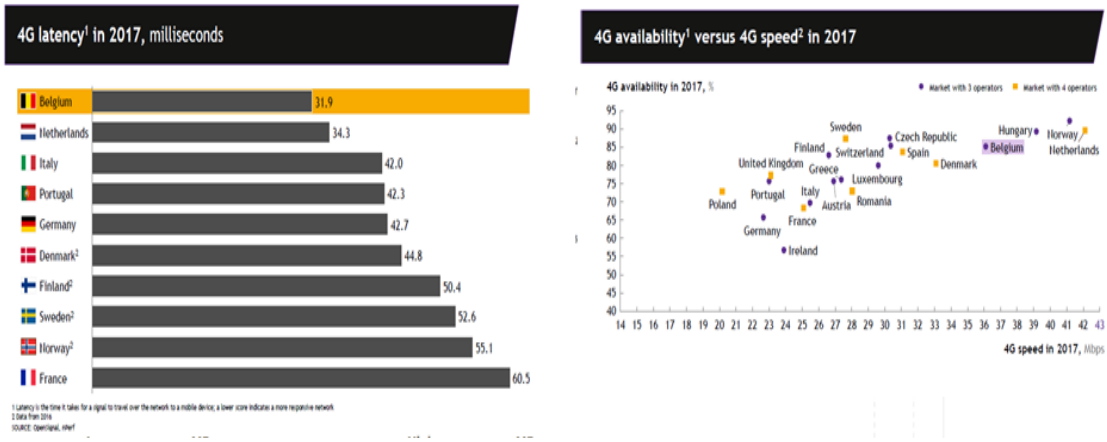


Figure 16: 4G quality in Belgium (source: OpenSignal)

25 Given that the tests are being carried out by two different companies, a complete comparability of the indicators must be ruled out. Nevertheless, the definition of the indicators is the same for both countries. Source for Belgium: Commsquare, 2018. Source for France: Arcep, Les mesures de 4GMark, 2018.

26 https://opensignal.com/reports/2017/02/global-state-of-the-mobile-network

56. Belgium has managed to fall behind somewhat regarding mobile broadband Internet access compared to the other EU Member States. However, the figures from 2017 clearly show that Belgium has now closed that gap. That is particularly the case concerning the coverage of the 4G networks, for which Belgium now holds the third place in the European benchmark. Based on these figures on the experienced quality, and in combination with the figures on coverage at present, we can conclude that Belgium currently has 4G networks that offer its inhabitants Internet access which is experienced as being of a high quality, more or less throughout the entire territory. The comparison above shows that the quality is better than the one experienced by the French consumer.

57. Belgium is still lagging behind in terms of subscriptions to mobile broadband, although they did increase by 10% between 2006 and 2017. In addition to price per GB and availability of Wi-Fi, which are both greater in Belgium, these lower mobile broadband sales can be partly explained by the relatively lower numbers of smartphones users in Belgium (75%) compared to other European countries (European average: 80%).

58. Lastly, the 2017 survey shows that concerning the consumer's perception of the Belgian electronic communications market, 67% is satisfied with the tariffs offered by their mobile operator and 80% is reasonably to very satisfied with the quality of the service. Nevertheless, the average scores in 2017 are slightly lower than those of 2016.

1.4.3 Take-up

59. Remarkably, since 2018, Belgium has continued to lag behind the rest of the EU when it comes to the take-up of mobile Internet. The most recent numbers from 2017 show that subscriptions including mobile Internet represent 72% of the total registrations, whereas in France and The Netherlands it amounts to 88%.

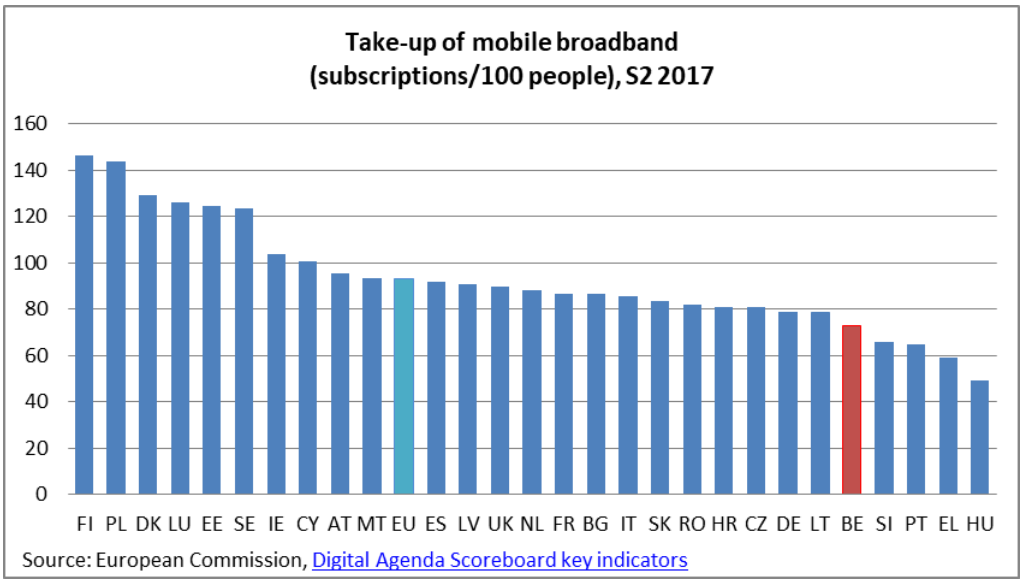


Figure 17: take-up of mobile broadband (source: European Commission)

60. It should be noted that the take-up of mobile broadband has increased by 10% in Belgium since 2017, as opposed to 4% at a European level. This means that Belgium can catch up.

1.4.4 Consumption

61. In the table below, we can see that the average Belgian had a mobile data consumption of 0.73 GB in the third trimester of 2017. This is significantly less than the European average (2.31 GB)[27].

27 International Roaming BEREC Benchmark data report April 2017 - September 18 (BoR (18) 31)

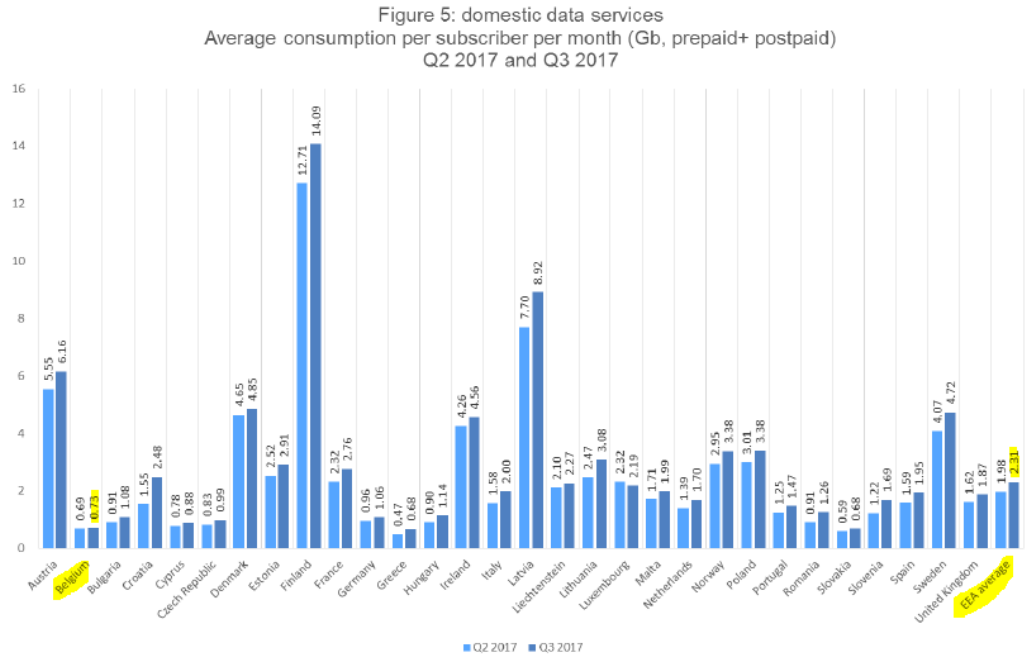


Figure 18: comparison of data consumption EU (source: BEREC)

62. This can be partly explained by the fact that Wi-Fi networks are available throughout almost all of our country, due to the extremely good coverage of fixed Internet and because the prices for mobile data are rather high for large users (see section "*1.3 Price evolution on the mobile market*"). This encourages users to use Wi-Fi connections instead of mobile data.

63. That extensive Wi-Fi coverage may also partly explain why Belgium may never be a frontrunner in mobile data consumption. The Netherlands, for example, where there is also an excellent Wi-Fi coverage, is similarly placed in this ranking. This situation is in contrast to that in a country like Finland, where only 75.1% of households have access to 30 Mbps (as opposed to 99% in Belgium), where much less time is spent on Wi-Fi networks and where the consumption of mobile data is higher (see figure 17 above). Large cities in Finland may have good Wi-Fi coverage but that is not at all the case in more rural areas where only 8.3% of households have access to an NGA network (as opposed to 91.5% in Belgium). It is therefore best not to put Belgium's position with regard to average consumption of mobile data first as a stand-alone objective. Neither can the consumption of Wi-Fi be found in the ARPU figures, since the use of Wi-Fi is mostly free.

64. We do however see that there is a positive link between the use of Wi-Fi and the price level. This means that the price per MB is probably higher in the countries where a lot of Wi-Fi is used, such as Belgium, the Netherlands and Germany.

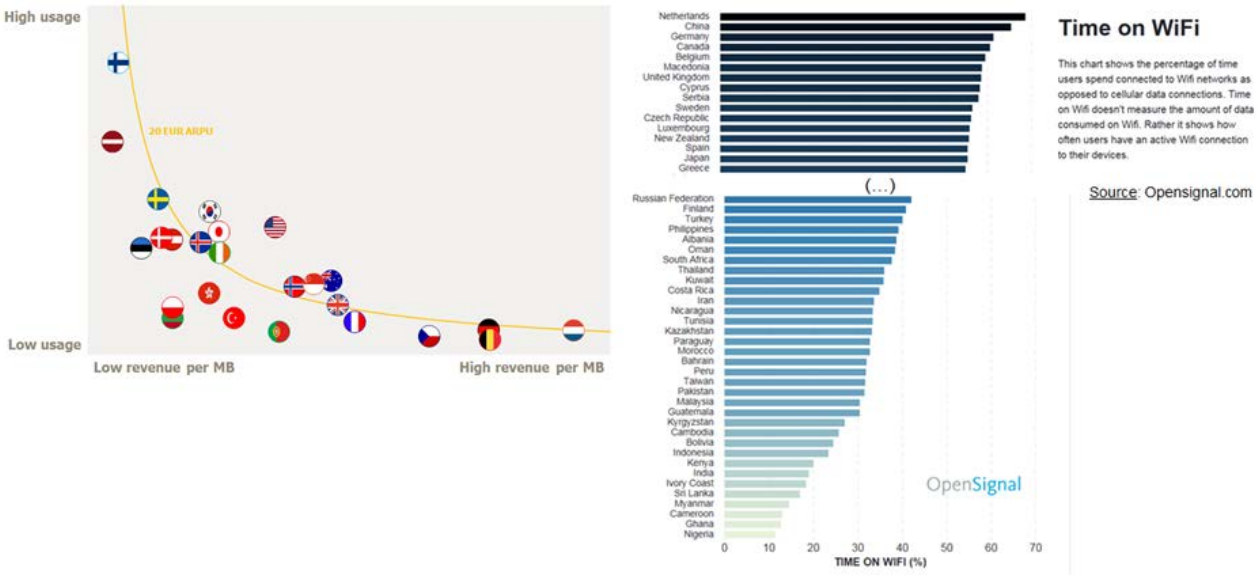


Figure 19: international comparison of revenue per MB (left) and Wi-Fi use (right) (source: OpenSignal)

1.4.5 Conclusion qualitative aspects

65. Belgium may have fallen behind in terms of coverage of the networks facilitating access to mobile broadband between 2010 and 2016, but the figures for 2017 show that Belgium has now caught up. That is particularly the case concerning the coverage of the 4G networks, for which Belgium now holds the third place in the European benchmark. The figures show that Belgium currently has at its disposal 4G networks which make Internet access possible across more or less the entire territory, and with a very good quality of client experience.

66. Moreover, studies show that the quality of client experience with mobile networks in high in Belgium. The download speed in Belgium is estimated at 43 Mbps on average, and an estimated 98% of video streaming is launched without interruption. Moreover, the level of quality established in Belgium is higher than in the French market[28], which has four mobile operators.

28 An important difference with the situation in France is also that, apart from there being 4 players in the market, the average monthly volume of downloads is significantly higher than in Belgium.

67. In 2017, 72% of the population had subscribed to mobile Internet, which is a lower percentage than in other Member States. The take-up of mobile broadband however rose in Belgium by 10% in 2017, as opposed to 4% at a European level. This would suggest that Belgium can catch up, even if the excellent finely-meshed Wi-Fi network in Belgium continues to take up part of the volume of consumption. Measures need to be taken to further stimulate the obstacle-free take-up of this service. That might mean measures regarding the supply, such as an expansion of the data included and a reduction in the prices, together with measures regarding the demand, such as raising awareness in the population about the benefits of mobile Internet. It should be noted that the latter measures have had merely a marginal impact on usage up till now.

2. SPECTRUM

2.1 Introduction concerning spectrum use

68. Mobile operators use a number of frequency bands. Not all frequency bands have the same propagation characteristics. The lower the bands, the better the propagation of the waves and the greater the zone a transmission site can cover.

69. The low bands (below 1000 MHz) are used to realise a coverage of the entire territory. The high bands (above 1000 MHz) are mostly only used where additional capacity is needed.

70. It is therefore important for a mobile operator to have frequencies in both the low and the high bands at their disposal.

71. The figure below shows the current distribution of the spectrum among the 3 existing operators. A historic summary of allocated licences can be found in Annex 1.

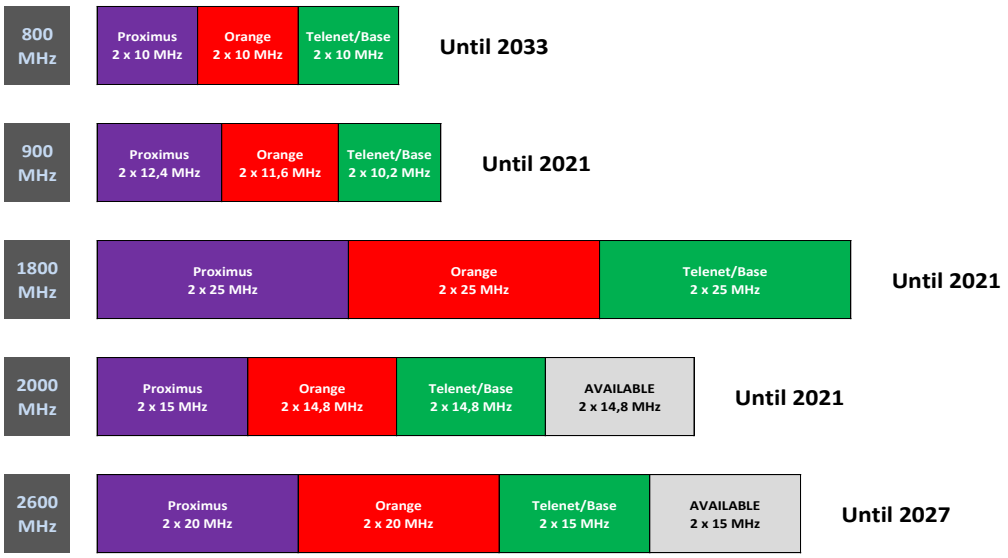


Figure 20: summary of the current user rights (source: BIPT)

72. Spectrum is still available in the 2000 and 2600 MHz bands. Very little use is made in Belgium of the 2600 MHz band, even the part allocated to the mobile operators. Therefore, the arrival of a fourth operator does not have to cause problems regarding the availability of sufficient spectrum above 1 GHz[29] (see below).

73. The table below shows which technologies are being rolled out in which bands.

Technology	Bands used for coverage	Bands used for capacity
2G	900 MHz	1800 MHz
3G	900 MHz	2000 MHz
4G	800 MHz	1800 MHz 2000 MHz 2600 MHz

Figure 21: technology per band (source: BIPT)

74. It should be noted that 2G and 3G technologies will disappear in time[30]. The 900 MHz band can then be used for 4G and 5G. In the Netherlands, for example, Vodafone has announced the end of its 3G network by January 2020.

75. It should also be noted that a fourth player would not roll out a priori 2G and 3G networks. However, a fourth player would a priori be obliged to roll out a 4G and a 5G network.

76. Regarding the licence situation of each band, the following distinctions should be made:

- Ongoing licences:
    - 800 MHz (30 MHz duplex[31] for the three MNOs) till 2033;
    - 2600 MHz (55 MHz duplex for the three MNOs) till 2027.

29 1 GHz = 1000 MHz.

30 There is at present no consensus about when 2G and 3G will disappear. 3G will most likely disappear before 2G.

31 1 MHz duplex is equal to 2 x 1 MHz. Paired spectrum is used for the FDD modus (Frequency Division Duplex); one band for the downlink and one band for the uplink.

- Bands that will be auctioned again until 2041:

    - 900 MHz (35 MHz duplex);
    - 1800 MHz (75 MHz duplex);
    - 2000 MHz (60 MHz duplex).

- New bands for 20 years:

    - 700 MHz (30 MHz duplex);
    - 1400 MHz (90 MHz SDL[32]);
    - 3600 MHz (400 MHz TDD[33]).

77. Citymesh and Gridmax are the only operators who have been allocated a band in the 3600 MHz band. This refers to the 40 MHz which is applicable in some municipalities.

2.2 Future technological evolution of 5G

78. 5G is the extension of earlier standards for mobile technology, such as 3G, LTE[34] (4G), LTE advanced (4G+) and 4.5G. 5G can also be said to be a trend breaker[35]. This technology is not merely a continuation of earlier standards, it can make possible new kinds of mobile data use that were previously impossible.

79. This technology ensures not only more performing and broadband speech and data connections, it can also digitise and interconnect various economic and social sectors[36]. 5G technology will therefore bring us heterogeneous solutions. This could be important in the event of a new player entering the market. It will enable new players to develop innovative and differentiated products not yet present on the market.

32 An SDL band (Supplementary Downlink) is a non-paired band, combined with a paired band, for additional downstream capacity.

33 Non-paired bands are used for TDD modus (Time Division Duplex); the same band for both the downlink and the uplink.

34 Long Term Evolution.

35 5G will be standardised on an international level by the ITU and 3GPP. In principle, the 3GPPP will work out the technical norms which answer the objectives established by the ITU. In Europe, the CEPT should be mentioned, since it has also established a roadmap for 5G. The European Commission is also very involved and has developed a 5G Action Plan.

36 In the context of 5G, these sectors are referred to as "verticals". This applies to the automotive industry, security services, the energy sector, healthcare sector, the media, etc.

80. A study by Arthur D. Little[37] emphasises these new possibilities offered by the roll-out of 5G. That will be in relation to new use cases/business models:

"The potential for success is also high – driven not just by possible differentiation and market share gains, but also by rolling out successful use cases and being pioneers and trusted partners in the building of new ecosystems.

We expect 5G to support the strategic shift of telecom operators from being predominantly providers of high-speed connectivity, to becoming true enablers of next-generation ecosystems. Some telecom operators are taking a strategic lead in 5G deployment – announcing their future plans with "big bets", which will impact the course of future 5G roll-out and the development path for the technology."

81. The study illustrates how operators can develop differentiated and innovative products thanks to 5G technology, each with their own business model and specific target group. The figure below shows a few examples of existing roll-out possibilities.

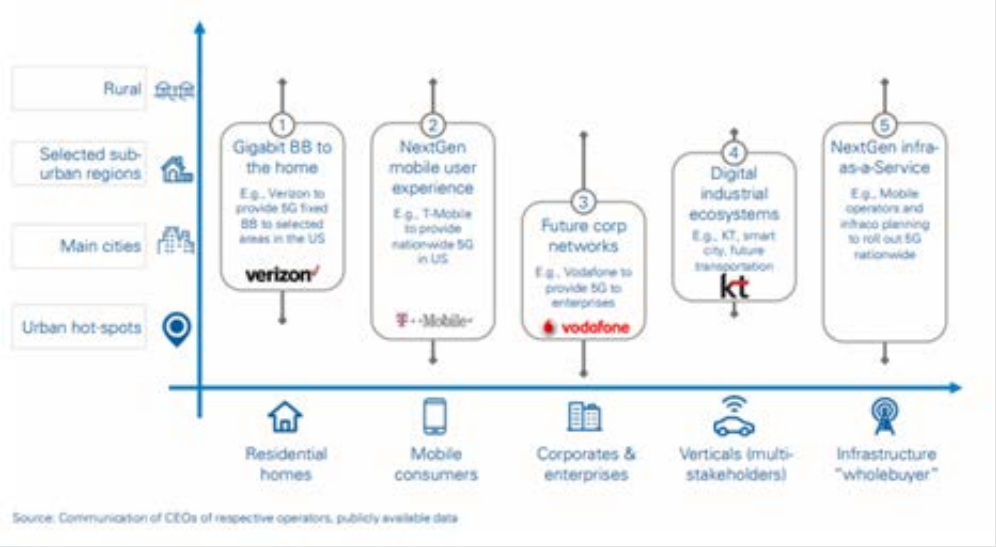


Figure 22: the possibilities of 5G technology for differentiated mobile products (source: Arthur D. Little)

37 Arthur D. Little: 5G deployment models are crystallizing, Opportunities for telecom operators to facilitate new business ecosystems – June 2017.

82. The development of 5G standardisation is currently in full flow. In an opinion[38] adopted on 9 November 2016, the RSGP[39] considers that the 700 MHz, 3600 MHz and 26 GHz bands are essential bands to introduce 5G in Europe and this before 2020. The RSPG believes that the 3400 - 3800 MHz band has the potential to give Europe a vanguard role in the roll-out of 5G.

83. At an international level, 5G is being standardised by the ITU[40]and 3GPP[41], a consortium of high-tech companies. On 14 June, 3GPP defined the standard and carried out an initial and successful interoperability test, reaching a downlink speed over 1.3 Gbps[42]. Finally, in Europe, the CEPT[43] and the European Commission are collaborating on the development of a 5G action plan[44]. All this significantly speeds up the entry of 5G technology.

84. Eight KPIs (key performance indicators) were established to specify, quantify and measure the features of the 5G systems. The figure below shows the anticipated improvements, between 4G+ (IMT-advanced) and 5G (IMT-2020) for these eight indicators.

38 RSPG (Radio Spectrum Policy Group) Opinion on spectrum related aspects for next-generation wireless systems (5G).

39 Advisory group on radio spectrum policy set up by the Commission Decision 2002/622/EC of 26 July 2002 establishing a Radio Spectrum Policy Group.

40 International Telecommunication Union.

41 3rd Generation Partnership Project.

42 See the following website: https://www.computable.nl/artikel/achtergrond/technologie/6386701/5182002/eerste-standalone-5g-nr-interoperabiliteitstest-slaagt.html

43 European Conference of Postal and Telecommunications Administrations

44 https://ec.europa.eu/digital-single-market/en/5g-europe-action-plan

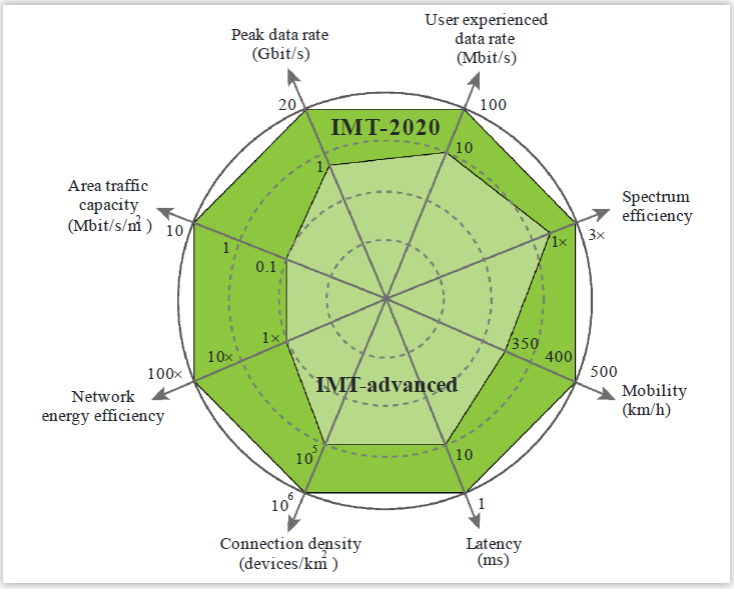


Figure 23: key performance indicators 5G (source: ITU IMT2000)

85. The eight indicators determine together the envelope of the maximum performance of 5G. However, not a single usage demands that these extreme values be simultaneously achieved for all indicators. That is the principle of network slicing: each layer (slice) has its own envelope, which is a compromise of the targeted usage. It enables an operator to provide services aimed at specific users, based on a single network infrastructure[45].

86. For the consumer, 5G will therefore lead to significantly better mobile communication, ultra-reliable networks for the Internet of Things and applications for which a very low latency is important[46].

87. A more efficient use of the spectrum will allow the arrival of 5G technology to partly absorb the possible competitive effects of the distribution of the available spectrum among 4 operators. A new fourth MNO in the market could enable an acceleration in the development and differentiation opportunities of these technologies, and their maximum use.

45 network for emergency services, such as ASTRID, or the army where gsm-R can be implemented this way... Or gaming networks (low latency) or hospital networks (medical assistance with highly-reliable connection and low latency), etc.

46 For example, self-driving cars, virtual reality applications, mobile gaming, etc.

2.3 Reserved spectrum

88. The entry of a new operator often goes hand in hand with "reserving" spectrum for the newcomer. By reserving spectrum, the newcomer has the opportunity of being the first to be able to purchase spectrum. Only after that do other (existing) operators get the chance to bid on the remaining lots. Reserving spectrum for a newcomer is essential in order to avoid existing operators locking down the market by purchasing all the spectrum to prevent entry of a newcomer. On the other hand, the reserved spectrum and the associated conditions for the newcomer must maintain a level playing field (for example, enough available spectrum in all bands relevant to traditional and future technologies) to allow them to compete with the existing operators.

89. It should be noted that a fourth player must absolutely have a portfolio of at least 2 blocks of 5 MHz duplex under 1 GHz in order to be able to roll out 4G and 5G networks across the entire territory.

90. Spectrum can also be reserved for existing players in order to guarantee a certain stability and continuity in the market. In that sense, it was proposed to reserve spectrum for the existing players in the bands for which they already have licences, that is to say in the 900 MHz, 1800 MHz and 2000 MHz bands.

91. The table below gives a summary of the spectrum cap (maximum capacity an operator may own) and the spectrum reserved in the absence of a fourth player.

Frequency band	Total capacity	Spectrum cap	Reserved spectrum	
			For each existing operator	For a newcomer
900 MHz	35	15	10	-
1800 MHz	75	30	20	-
2000 MHz	60	25	10	-
700 MHz	30	10	-	-
1400 MHz	90	35	-	-
3600 MHz	400	100		

Figure 24: reserved spectrum in the absence of a fourth player (source: BIPT)

92. The table below gives an overview of the spectrum cap and the spectrum reserved in the presence of a fourth player. This table indicates which spectrum should be

reserved in order to create a level playing field between the players, on the basis of the spectrum portfolio at least. The non-reserved spectrum will be auctioned among all players (existing and new) who will pay the market price (a reserve price, or minimum price, will in any case be determined). Should it register for it, the newcomer would have to pay a total price of 115.5 million euros for the reserved lot.

Frequency band	Total capacity	Spectrum cap	Reserved spectrum	
			For each existing operator	For a newcomer
900 MHz	35	15	5	5
1800 MHz	75	30	15	15
2000 MHz	60	25	10	10
700 MHz	30	10	-	5
1400 MHz	90	35	-	15
3600 MHz	400	100		

Figure 25: reserved spectrum in the presence of a fourth player (source: BIPT)

93. The newcomer will pay a total price of 115.5 million euros for the reserved lot.

94. Reserving spectrum in the 3400 - 3420 MHz band at 3600 MHz for existing user right holders is being considered. There is however a spectrum cap of 100 MHz per player (there is a total of 400 MHz in this band). In practice, therefore, a fourth player could also acquire spectrum in this band (crucial for 5G) due to this cap.

95. Spectrum is reserved only at 700 MHz for the new player. The reason behind this is that each of the three MNOs has acquired 10 MHz in the 800 MHz band, while the fourth player can no longer acquire anything in the 800 MHz band. This means that one of the lots for the three remaining players will be limited to 5 MHz, while the other two lots will consist of 10 MHz.

96. The table below shows how much an existing player pays for the spectrum reserved for them and how much a newcomer pays.

	Existing player	Newcomer
700 (5 MHz duplex)	No reservation	33.5 million euros
900 (5 MHz duplex)	28 million euros	28 million euros
1800 (15 MHz duplex)	27 million euros	27 million euros
2000 (10 MHz duplex)	18 million euros	18 million euros
1400 (15 MHz SDL)	No reservation	9 million euros

Figure 26: price of reserved spectrum (source: BIPT)

2.4 Impact in terms of availability of spectrum for the existing operators

97. Three additional new bands will be made available, of which 2 are above 1 GHz. In the event of the arrival of a fourth operator, 3 bands will be auctioned again and where necessary, divided among 4 players instead of 3. The bands above 1 GHz offer the opportunity of providing a similar service as the bands below 1 GHz, but require more base stations to cover the same area.

98. Concerning the impact for the existing operators is concerned, a distinction should be made between:

- the consequences of a redistribution of the spectrum among the existing operators.

  This redistribution could benefit some operators and disadvantage others. The only way to avoid such a redistribution would be to simply extend the existing licences. However, the consequences of such a redistribution do not fall within the framework of this opinion.

- the consequences of spectrum being reserved for a fourth player

  These consequences are discussed in the paragraphs below.

99. A distinction should be made between the impact on the existing services (2G, 3G and 4G) and the impact on the new 5G services. On the one hand, the potential loss of spectrum in the 900 MHz, 1800 MHz and 2000 MHz bands could have an impact on existing services. On the other hand, not acquiring enough spectrum in the 700 MHz band could have an impact on the new 5G services. The future use of the 1400 MHz band has not yet been effectively defined. In any case, the 1400 MHz band is less important for mobile operators than the other bands.

100. The following table shows the average amount of spectrum for the 3 existing MNOs.

<table>
<tr><th rowspan="2">Frequency band</th><th colspan="2" rowspan="2">Current situation</th><th colspan="4">Situation after 15 March 2021[47]</th></tr>
<tr><th colspan="2">Without 4th player</th><th colspan="2">With 4th player</th></tr>
<tr><td>700 MHz</td><td>-</td><td rowspan="3">21.4 MHz duplex</td><td>10 MHz duplex</td><td rowspan="3">31.6 MHz duplex</td><td>8.3 MHz duplex</td><td rowspan="3">28.3 MHz duplex</td></tr>
<tr><td>800 MHz</td><td>10 MHz duplex</td><td>10 MHz duplex</td><td>10 MHz duplex</td></tr>
<tr><td>900 MHz</td><td>11.4 MHz duplex</td><td>11.6 MHz duplex</td><td>10 MHz duplex</td></tr>
<tr><td>1400 MHz</td><td>-</td><td>-</td><td>30 MHz (SDL)</td><td>30 MHz (SDL)</td><td>25 MHz (SDL)</td><td>25 MHz (SDL)</td></tr>
<tr><td>1800 MHz</td><td>25 MHz duplex</td><td rowspan="3">58.2 MHz duplex</td><td>25 MHz duplex</td><td rowspan="3">68.1 MHz duplex</td><td>20 MHz duplex</td><td rowspan="3">56.5 MHz duplex</td></tr>
<tr><td>2000 MHz</td><td>14.9 MHz duplex</td><td>19.8 MHz duplex</td><td>16.5 MHz duplex</td></tr>
<tr><td>2600 MHz</td><td>18.3 MHz duplex</td><td>23.3 MHz duplex</td><td>20 MHz duplex</td></tr>
<tr><td>3600 MHz</td><td>-</td><td>-</td><td>100 MHz (TDD)</td><td>100 MHz (TDD)</td><td>100 MHz (TDD)</td><td>100 MHz (TDD)</td></tr>
</table>

Figure 27: average spectrum for 3 MNOs (source: BIPT)

47 For the situation after 15 March 2021, the average amount of spectrum per existing operator is equal to a third of the total capacity minus the amount of spectrum reserved for a newcomer.

101. Concerning spectrum after the deduction of the reserved spectrum for a fourth player, we can draw the following conclusions:

- The average spectrum below 1 GHz for existing operators will rise by 30%;
- The average spectrum between 1 and 3GHz for existing operators will fall by 3%;
- The amount of duplex spectrum per operator will remain roughly the same;
- There will be an additional 20 MHz per operator for SDL;
- There will be an additional 100 MHz per operator for TDD.

102. The anticipated strong increase in data traffic can be absorbed by the use of the SDL band at 1400 MHz, the TDD band at 3600 MHz and a compaction of the network, but not by raising the amount of MHz duplex spectrum.

103. The 3600 MHz and 700 MHz bands are regarded as the primary bands for 5G. In this situation, a player who only acquires 5 MHz (the newcomer or the 3rd player who makes the lowest bid in an auction) will have to look for other, more expensive solutions to compensate for the necessary capacity (in other bands, for example (1400 or 3600 MHz)) which will also reduce the profitability of this already weaker operator. As an alternative, this operator can also try to conclude RAN sharing[48] agreements with another operator (a possible fourth operator, for example). RAN sharing makes it possible to limit costs, given that the radio network is shared by two operators.

104. On the other hand, the arrival of a fourth operator does not have to cause problems regarding the availability of sufficient spectrum above 1 GHz. After all, there will be a number of additional bands above 1 GHz. There will be a total of 490 MHz of additional spectrum. This additional spectrum can be distributed among the four operators, and can be used to meet the increased demand for capacity, for example:

48 RAN: Radio Access Network

- There will be an additional 90 MHz at 1400 MHz for SDL; this spectrum can be used for extra downlink capacity;

- The current bands at 2600 MHz are barely being fully utilised;

- There will be an additional 400 MHz at 3600 MHz; this means that about 100 MHz will be available for each of the four operators, which should enable each operator to meet the 5G expectations. In the future (2020 and after), additional bands (at 26 GHz, for example) will be made available for 5G.

105. Regarding the loss of spectrum in the 900 MHz band, there are 2 possible scenarios:

- The 3 existing operators each acquire 10 MHz duplex. In that scenario, there would be a slight loss of 2G capacity in rural areas for Proximus and Orange. At present, BASE already has 10 MHz duplex in the 900 MHz band; which does not seem to cause any problems.

- One of the existing operators acquires only 5 MHz duplex. In that scenario, it would be impossible for the operator to maintain 2G and 3G coverage. That operator would more than likely be obliged to stop 3G by 2021 at the latest.

106. The loss of spectrum in the 1800 MHz band could result in the loss of 4G capacity and/or reduction in the peak rate of 4G. However, it should be noted that today each of the 3 operators uses only 20 MHz duplex for 4G in the 1800 MHz band, which corresponds to the average amount of spectrum per existing operator in the scenario with a fourth player (see table of figure 24).

107. The loss of spectrum in the 1800 MHz band can be partially compensated by the available additional spectrum in the 2000 and 2600 MHz bands. Given that propagation at 2000 MHz, and especially at 2600 MHz, is not quite as good as at 1800 MHz there could be, despite everything, a slight reduction in coverage zones with extremely high speeds.

108. The loss of spectrum in the 2000 MHz band is unlikely to have a negative impact on existing services, since the available spectrum is greater than that being reserved for the newcomer.

109. In the short and medium term, the 5G coverage should be ensured by the 700 MHz band and 5G capacity by the 3600 MHz band.

110. Since 5 MHz duplex of the 700 MHz band is reserved for a newcomer, one of the 3 existing operators would acquire only 5 MHz duplex in that band. The 5G capacity

and peak rate for that operator would be less than 50% in rural areas and deep indoor compared to the other two existing operators. However, this operator can acquire 5G performances identical to those of the other two existing operators by using the 900 MHz band for 5G, provided that the first operator decides to stop 3G. If this same operator were to acquire only 5 MHz duplex in the 900 MHz band, it would have to stop 2G and 3G in order to achieve 5G performances identical to those of the other two operators. In time, compensation for this could be made available at 1400 and 3600 MHz for the indoor coverage. Moreover, two operators with 5 MHz in rural zones can decide to share spectrum.

111. Operators will have to adjust their networks to the new situation after the auction. This could lead to transition problems. It should be pointed out that the spectrum at 700 MHz will be available from mid-2020, while the current licences at 900, 1800 and 2000 MHz run until March 2021.

112. The following figure shows the distribution of spectrum between the various operators in the European Union:

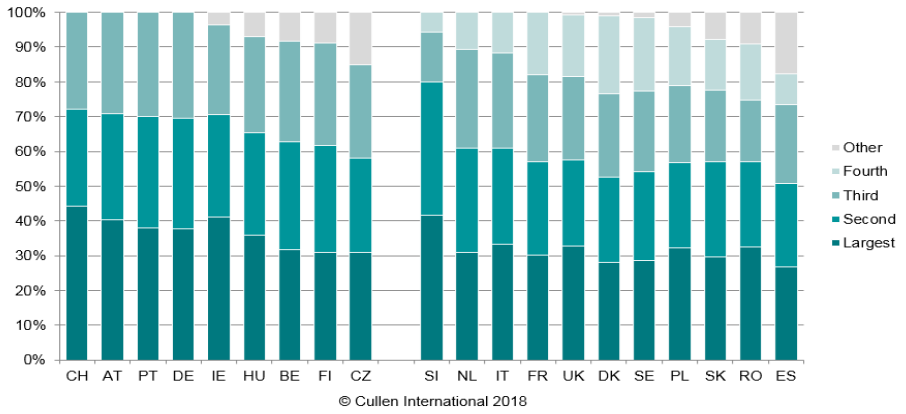


Figure 28: distribution of spectrum among operators in the EU (source: Cullen)

2.5 Distribution at 700 MHz

113. An operator with only 5 MHz duplex in the 700 MHz band is by definition less competitive than an operator with 10 MHz in a *ceteris paribus* assumption. Concerning the question of whether 5 MHz is enough, we can refer to the situation in France.

114. During the 700 MHz auction in France, the following results were achieved:

- operator SFR occupies the first place in the band and was allocated 5 MHz duplex for a bid of € 466,000,000;

- operator Orange is second in the band and was allocated 10 MHz duplex for a bid of € 933,078,323;

- operator Bouygues Telecom is third in the band and was allocated 5 MHz duplex for a bid of € 467,164,000;

- operator Free Mobile is fourth and was allocated 10 MHz duplex for a bid of € 932,734,001.

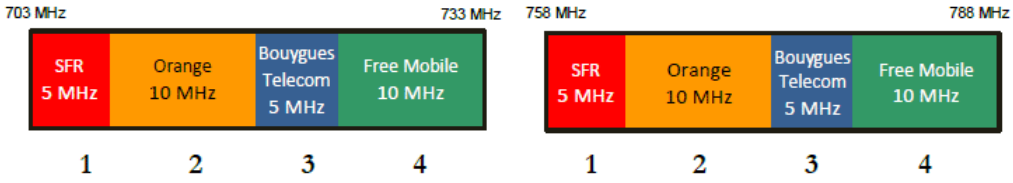


Figure 29: result 700 MHz auction in France (source: Arcep)

115. It should be added here that, in France, there is a far-reaching RAN sharing agreement between SFR and Bouygues Telecom meaning that there is de facto 10 MHz duplex available jointly.

116. This could result in the following situation in Belgium, if one were to assume that for example, two operators would both acquire 10 MHz in the 700 MHz band after auction.

Fourth operator	Operator X	Operator Y	Operator Z
5 MHz	5 MHz	10 MHz	10 MHz

Fourth operator	Operator X	Operator Y	Operator Z
5 MHz	5 MHz	10 MHz	10 MHz

Figure 30: potential distribution of the 700 MHz band in Belgium (source: BIPT)

2.6 Pylons and antennas

117. One of the major challenges a possible fourth operator will face is the acquisition of the necessary building and environment permits for the sites, pylons and antennas. Currently, each of the 3 operators has between 3,000 and 4,500 sites in use in Belgium.

118. Some of those are shared. Shared use is paid for per layer of 3 metres. Roughly a quarter of the sites is covered by this regulation. Joint costs between operators are low because everyone rents from and to everyone else and the delta is relatively low. Any new operator will only be able to rent from, and not to, so those costs will be higher.

119. The pylons are dimensioned for use by 2 or 3 operators. If a fourth operator also wishes to use the pylon, it will have to be replaced by a new one. The price range for a new pylon is roughly 150k€ (between 100k€ and 200k€). Replacing 1,000 pylons therefore costs somewhere around 150M€. The new operator will be solely liable for these costs, if the other operators do not place additional antennas. The present system is balanced for the existing operators but will not make it easy for a new player.

120. All the rest is rented from private or third parties (for example masts from Elia, church wardens, NMBS/SNCB, ASTRID, and from private individuals in cities, on flat roofs, etc.). The rental fee is determined between the operator and the letter, on a commercial basis.

121. It is clear that it will take years to roll out a complete network. Not so much because of technical restrictions, but mostly because the administrative and urban planning procedures will cause delays. A building permit is needed to build sites. The rules vary from one region to another: they range from exemption from permit (Flanders) if you build on an existing structure (a church tower, for example) and that structure will not be built any higher, to the situation in which a permit is always required (Wallonia), even if it only concerns replacing one type of antenna with another type. For Brussels, it takes a really long time.

Processing times for acquiring a building permit vary from roughly:

- 300 to 700 days in Brussels;
- 6 months in Flanders;
- 3 to 4 months (+ possibility of appeal) in Wallonia.

122. It is, of course, possible to apply for the obligatory site sharing. Every new operator can join the RISS[49], which coordinates site sharing between operators. However, site sharing will only solve a few of the problems. The available platforms on pylons have been largely claimed by the existing operators. Moreover, the

49 RISS: the RISS is a non-profit organisation which stands for Radio Infrastructure Site Sharing. It is under the supervision of the BIPT. The RISS supports the expansion and use of a database of antenna sites, aimed at sharing passive infrastructure, among other things.

maximum wind load means that in many cases, additional antennas are not possible. So, if a fourth operator arrives, it will have a right to site sharing but, in that case, extra capacity will have to be found within these sites (via higher masts, for example).

123. The candidate operator knows that this is a real challenge and will collect all the information necessary before actually making its candidature known. On the other hand, this issue is clearly a European one. It will therefore not necessarily be possible to use this problem as differentiation with regard to other areas of investment. In some Member States, however, there are companies that specialise in the sale of antenna sites (in Italy, for example, Towerco rents out sites for mobile antennas/masts).

124. The extension of an additional total parallel infrastructure is not necessarily the solution for the problem of meeting the coverage obligations. In France, for example, SFR and Bouygues Telecom (the second and third mobile operators) share 80% of the radio access network. The allocation of user rights to four independent operators need not imply that four independent infrastructures have to be set up. On the contrary, a possible market entry of a fourth player will also reduce costs for the existing operators.[50] Network sharing is the ultimate means for mobile operators of reducing costs.

125. "RAN sharing agreements" are also possible in Belgium (see communication BIPT[51]). There are no large-scale agreements in place in Belgium at present (only small ones for coverage of, for example, a tunnel). However, BIPT expects that, in future, shared infrastructure will in fact be used for 5G. The last time efforts were made to introduce a fourth operator in Belgium, Bidco (joint venture of Telenet and Nethys) was unsuccessful in closing a RAN-sharing agreement with the three existing MNOs.

126. In any case, the new legislative framework provides for a period of mandatory national roaming in as far as the new player can already provide 20% real population coverage, for a period of ten years following the granting of the licence. This temporary roaming is intended to give the new player the necessary

50 http://www.analysysmason.com/About-Us/News/Newsletter/Active-RAN-sharing-Oct2014/

51 BIPT communication containing guidelines on infrastructure sharing, 19/01/2012 - http://www.bipt.be/en/operators/radio/rights-of-use/communication-containing-guide

breathing space and enables it to cover the whole territory till the end of this period.

127. It is important to note here that population coverage achieved with national roaming does not count in meeting the mandatory coverage percentages after three, six and nine years respectively. RAN-sharing agreements do count[52].

2.7 Aspects related to environmental issues

128. Each region has its own legislation regarding the maximum levels of exposure to radiations. The regulation is much stricter in the Brussels Capital Region than in the other two regions.

129. When 4G was introduced, it caused great problems of coverage in the Brussels Capital Region. The regulation in Brussels at the time, and the policy concerning radiation standards, formed a serious obstacle to the technical possibilities for 4G to be able to thrive, with undesirable consequences for economic development, job creation and the consumers within the Brussels Capital Region. If we compare the limit value in Brussels (f/40000 W/m^2, which corresponds to a field of around 3 V/m for f = 900 MHz) in 2013 with the limit value from Recommendation 1999/519/EC of the European Parliament and of the Council of 12 July 1999 and the Recommendation of the WHO (World Health Organisation) (f/200, which corresponds with a field of around 41 V/m for f = 900 MHz), then the Brussels standard is more than 200 times stricter[53] than those of the EU and WHO recommendations. The standards in Wallonia and Flanders are less strict than in Brussels, but remain significantly stricter than the WHO standard, which is applied in many countries.

130. At the time, BIPT published the Communication of the BIPT Council of 15 February 2013 on the radiation standards in the Brussels Capital Region[54]. The standards at the time made the introduction of 4G- LTE networks in the 1800 MHz band impossible on some sites. Had these standards not been adjusted, disproportionate substantial technical changes would have had to be made to the various networks.

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52 See marginal 125.

53 The power density (in W/m2) is equal to the square of the field (in V/m).

54http://www.bipt.be/en/operators/radio/antennas-site-sharing/communication-of-the-bipt-council-of-15-february-2013-on-the-radiation-standards-in-the-brussels-capital-region

Moreover, the quality of communication would also have significantly deteriorated (poorer sound quality, more interruptions during calls, poorer accessibility of emergency and security services and more problems with the hand-over).

131. Brussels subsequently partially adjusted the regulation to enable operators to deploy 4G in Brussels. However, the new regulation is still about 50 times stricter than the WHO recommendation. For licensed operators in the Brussels Capital Region, a maximum cumulative exposure level applies of no more than f/9375 W/m^2 (which corresponds to a field of roughly 6 V/m for f = 900 MHz). This means that the power contributions of all networks of all operators are taken into account together.

132. Nonetheless, the result was a serious delay in the deployment of 4G in Brussels, and we still have not closed the gap with other major European cities. There is a similar risk for 5G in Brussels.

133. And this problem threatens to worsen with the introduction of a fourth operator, since the radiation limit will have to be spread over four operators instead of three. The implementation of 5G in the present circumstances, and with the current radiation standards in Brussels is already extremely difficult for existing operators.

134. As a result, BIPT emphasises that the Brussels Capital Region will have to adjust the current radiation standards if 5G is to be made available and/or if a fourth player is to be allowed. Without more flexibility in the radiation standards, rolling out its own network in Brussels will be extremely difficult for a fourth operator and will also impact the existing operators. It is therefore to be expected that a fourth operator, in anticipation of such a relaxation, will remain partly dependent on roaming. There is an ongoing debate in the Brussels Parliament at present, on the relaxation of the radiation standards, based on the recent report by a committee of experts on non-ionising radiation[55].

135. A limit of 3 V/m (at 900 MHz) per antenna applies in Flanders and of 21 V/m cumulative (at 900 MHz) . In Wallonia, there is a standard of 3 V/m per antenna,

[55] http://weblex.brussels/data/crb/doc/2017-18/134207/images.pdf

and no cumulative standard. In both Flanders and Wallonia, the entry of a fourth operator would therefore cause no problems regarding radiation standards[56].

2.8 Conclusion spectrum

136. Due to the fact that 3 additional bands (700, 1400 and 3600 MHz) are being allotted in the auction, with or without a fourth player, more spectrum will become available for the existing operators. An evaluation shows that the amount of duplex spectrum per operator remains reasonably stable (both below and above 1 GHz) and that additional spectrum will be made available, that will be especially used for 5G. BIPT also emphasises that the 2600 MHz band that has been allocated since 2012 is currently being significantly underused in Belgium at present. It is perfectly possible that the loss of spectrum in the 900 MHz band will fail to force any of the three existing operators to stop 3G no later than 2021. The loss of spectrum in the other existing bands (1800 and 2000 MHz) could be compensated by the allocation of available spectrum in other bands, and would not have any clear impact on the quality of existing services.

137. Operators will have to adjust their networks to the new situation after the auction. Adjustments will be necessary, whether there is a fourth player or not. In the case of four operators, the adjustments will probably be more important than if there were no fourth player. This could lead to transition problems, certainly given that existing MNOs are going to have to surrender 900 MHz spectrum. This means problems of quality arising during the migration period, at least temporarily.

138. The introduction of 5G should lead in time to consumers experiencing greatly improved mobile communication, extremely reliable networks for the Internet of Things and applications for which a very low latency is important, such as for the self-driving car. The effects of 5G will determine the quality offered to the consumer. Here too, the entry of a fourth player should have no impact on the potential roll-out of 5G in terms of spectrum capacity. Every player (existing and new) would have a spectrum lot that is enough for the roll-out of 5G (initially in the 3600 and 700 MHz bands). A new, fourth MNO in the market could contribute to the acceleration of the development and differentiation possibilities of this technology and ensure that the broad range of options offered by this technology in a number of economic sectors is fully utilised. It could also stimulate new

[56] That is assuming the radiation standards remain unchanged.

revenue models and value creation which in time would benefit end users and all operators alike.

139. One major challenge a possible fourth operator will face is the acquisition of the necessary building and environment permits for the sites, pylons and antennas. The mandatory regulation regarding site sharing was developed for the case of the three existing operators and as such will be able to solve only a small part of the problem. Processing times for acquiring a building permit are long and there may be much social protest against the introduction of new pylons. BIPT also points out that the Brussels Capital Region will have to adjust the current radiation standards if it wishes to allow a fourth operator or develop 5G. This adjustment will in any case be necessary for the roll-out of 5G services by existing operators.

3. POSSIBLE OPTIONS FOR THE MOBILE TELEPHONY MARKET

140. The playing field of the Belgian mobile market could develop in a number of ways in coming years, given the regulatory decisions being made. Within the framework an impact analysis, BIPT distinguishes three possible scenarios for this, which are discussed below:

- **Status quo of the existing playing field** (see section "3.1 Status quo of the existing playing field"). In this scenario, the existing regulation is maintained. That means that there will be no change in the market dynamics. The competitive situation in the mobile market will continue to develop, also under the current measures.

- **New regulation in the mobile market** (see section "3.2 New regulation in the mobile market")

- Entry of a **fourth MNO** (see section "3.3 Entry of a fourth MNO")

3.1 Status quo of the existing playing field

3.1.1 Existing regulation regarding transparency

141. Since 2015, BIPT has decided to stimulate transparency in the market by way of various projects. The aim is to ensure that the consumer can make an informed choice, based on objective criteria. Transparency in the market affects not only prices but also quality (network coverage and operational quality of the services). The tools that are at the public's disposal are the tariff simulator, the coverage atlas and the quality barometer. Moreover, since 1 July 2017, the Easy Switch procedure has made it easier to change fixed operators. This procedure gives a mandate to the new operator to facilitate the change of operator instead of the client having to organise it, and to reduce the possible complexities/problems experienced with migrations. In the mobile market, there is naturally less of a barrier to switching operators, since only the SIM card has to be changed (see section "1.2 *Churn and ARPU*").

142. These tools and regulations are certainly useful, in particular in making objective price comparison easier or identifying the white spots, but it must be emphasised that the vast majority of consumers still allows their choice to be determined by either the operators' marketing campaigns or recommendations from family and friends.

143. As described in chapter "*1 Dynamics in the Belgian mobile market*", there is a number of smaller MVNOs in the mobile market in addition to the three full mobile operators. In some cases, they have competitively priced offers, even from a

European perspective and also for the heavier profiles. However, these smaller players do not have the same commercial resources at their disposal with which to effectively position their interesting offers in the market. But Medialaan, which operates mobile brands Mobile Viking and Jim Mobile, is expected to be able to exert extra competitive pressure in coming years, as an integrated media company.

144. Moreover, these transparency measures will only really be able to stimulate changes of operator from the moment that there is actually a choice between operators. In that regard, in the mobile market, we have noticed, on the one hand, the entry of several players in recent years, thanks to MVNO agreements, which expands the consumers' range of possible choices. On the other hand, consolidation[57] in the mobile market means that the consumer can only choose from three full MNOs. And the barrier to switching operators is made higher for the end user by the use of bundled offers including broadband Internet and broadcasting components (see section "*1.1 Market shares and convergence*").

145. Other measures aimed at intervening in the retail price are not considered, due to the European regulatory framework that prohibits the use of any measure aimed at price control without first carrying out a market analysis[58]. The European framework requires that before a price measure is imposed on the retail market, it must first be applied in the wholesale market.

3.1.2 Market regulation in the related wholesale markets

146. In addition to the regulation of termination rates in the mobile wholesale market, operators offering mobile services are also governed by regulation on related markets for the services they offer over their fixed networks. In Belgium, Proximus and the cable operators Telenet, Brutélé and Nethys[59] have at their disposal a fixed network, to which other operators can gain access through a regulated offer.

57 In particular the takeover of BASE by Telenet (see marginal 17).

58 The roaming regulation forms an exception to that principle, and was largely based on the rules of the EU Treaty on the establishment of the internal market, since roaming is seen as a barrier to this internal market.

59 Brutélé and Nethys (formerly Tecteo) operate under the common brand VOO. They offer broadband Internet and broadcasting services. They also provide mobile services through an MVNO agreement with Orange, which will soon be converted to an MVNO agreement with Telenet.

147. In the fixed market for broadband Internet and broadcasting services, operators Telenet and Proximus (MNOs with a fixed network) are obliged by this regulation to open their network to alternative operators at a regulated price. Orange (an MNO with its own mobile network but no fixed network) is the main alternative operator in these markets offering broadband Internet and broadcasting services. It does this through the regulated wholesale supply over the cable operators' network. For the end user, the company bundles these regulated products for broadband Internet and broadcasting with mobile products, that it provides over their own mobile network.

148. In March 2016, Orange launched a bundled offer with its own mobile component in this way. By the end of 2017, the customer base had grown to 102,900, signifying a market share of [0-5%] in the broadcasting market[60].

149. There is similar regulation at a wholesale level in the wholesale markets for **fixed telephony[61] and leased lines**[62]. Obligations in these markets must enable alternative operators to offer competitive products in the end users' market, bundled with mobile telephony.

150. These various forms of regulation of related markets are extremely important in order to stay competitive in the end users' market for mobile telephony. There is also a growing interest in bundled offers in which users take up mobile services, such as those underlined in section "*1.1 Market shares and convergence*".

60 Orange, analysts and investors toolkit FY2017.

61 At present, 2 wholesale markets for fixed telephony are regulated: the call origination and call termination markets. The obligations imposed in this context mainly concern interconnection between operators and the associated tariffs. In the retail market for access to telephony, there is currently still a selection/preselection (CS/CPS) obligation for Proximus at wholesale level. This means that users with a Proximus connexion can choose another telephone services provider than the one for access to the telephone network. These measure gives alternative operators the opportunity of winning customers fast, without large investments, meaning economies of scale can be realised. BIPT is currently working on a review of these three market analyses.

62 The obligations concerning leased lines in the wholesale market are intended to ensure that alternative operators with no fixed network can compete in the supply of products for high-quality, fast connections with a large capacity. These are applications for the business users' market. In the latest analysis on this subject, Proximus is considered having significant market power, which makes it obligatory for the company to ensure a regulated leased line offer for alternative operators.

151. Without regulation of these related markets, it is likely that a mobile operator who has no fixed network will no longer have access to the fixed operators' networks, in order to develop offers that combine fixed and mobile services.

152. Looking ahead, the increasing need to unburden the mobile networks of data traffic reinforces the complementariness of the fixed and mobile services. Faced with the risk of congestion, the mobile operators need access to a fixed network. A mobile operator with no access to an extensive fixed network would therefore find itself in a disadvantaged position[63].

153. For these two reasons (impossibility of making offers combining fixed and mobile services and impossibility of relieving one's network of mobile data traffic), competitors in the market for mobile services would be undermined if fixed services and other related markets were not regulated.

154. The development of the Belgian market has shown that fixed operators with no mobile infrastructure (Telenet or VOO, for example) were in fact able to access a mobile network in order to develop MVNO or full MVNO activities, even without regulation. Conversely, without regulation, it would have been impossible for mobile operators without fixed networks (Orange, for example) to gain access to the fixed markets.

155. Market regulation in these wholesale markets is therefore vital for operators with no fixed network if they are to remain competitive in the mobile market.

156. The current requirements in the wholesale markets for fixed access, currently being reviewed in a new market analysis, will give existing mobile operators with no fixed network more possibilities to retain and improve their competitive position.

3.1.3 Market regulation of mobile tariffs for call termination

157. Today, regulation is applied to the wholesale market for call termination. In that context, BIPT already imposes obligations on the mobile operators in this

63 Ecorys, Idate and ICRI, Future electronic communications markets subject to ex-ante regulation, Final report for DG Connect, 18 September 2013.

wholesale market[64]. These obligation concern interconnection between each others' networks and the wholesale prices a mobile telephony operator charges to other (fixed, mobile or foreign) operators every time they let a call be terminated on mobile numbers belonging to the operator in question (known as Mobile Termination Rates, or MTR rates).

158. These MTR rates have systematically fallen in recent years, to a maximum of 0.99 euro cent/minute in 2017[65]. This fall played an important part in the development of the price level (see section "*1.3.1 Price evolution in Belgium"*) and the levelling of rates for calls to mobile numbers, on the one hand, and fixed numbers, on the other hand. The impact of this regulation is admittedly restricted to mobile voice telephony.

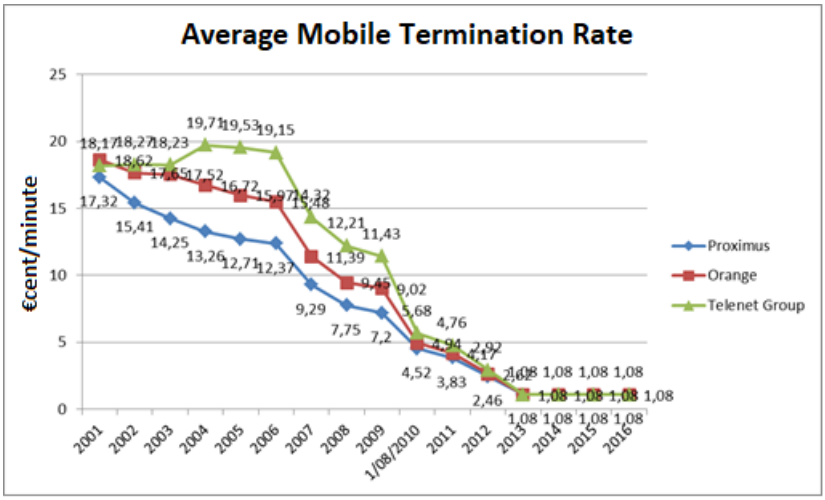

Figure 31: development of the average real nationally regulated MTR rate of the three Belgian mobile operators, without inflation (source: BIPT, operators).

3.2 New regulation in the mobile market

159. The European telecom framework does not allow direct regulation in the **end users' market** for mobile telephony. There is an assumption in this market that operators do not have significant market power and that entry on a commercial basis is possible via MVNO contracts. The European Commission also believes that

64 Decision of the BIPT Council of 26 May 2017 on the analysis of market 2: voice call termination on individual mobile networks.

65 Laid down by the Decision of the BIPT Council of 26 Mayi (see above).

problems should be solved by way of the competition law. Regulation of the prices in the end users' market for mobile telephony is therefore impossible, even if it were to be desirable.

160. BIPT could oblige operators with a mobile network to open it to other operators. This regulation in the **wholesale market** for mobile telephony allows other operators to be active in the end users' market. Reserving additional spectrum for a new player is thus unnecessary.

161. However, this option is barely realistic. The market for mobile access is no longer one of the markets included in the European Commission's list of recommendations[66]. Furthermore, mobile access is unregulated in almost all other Member States, with the exception of Cyprus [67] (other exceptions are Spain, where collective dominance was established but where that regulation was recently lifted, and Ireland[68]).

162. Proving which market parties have (individual or collective) significant market power here is difficult in a market with at least three parties. The imposition of such an access obligation following a market analysis would therefore be difficult for the European Commission to accept, as it has a veto right over such market analyses. And because MVNO contracts have to be concluded, market entry is also possible on a commercial basis. BIPT regards this option as unrealistic.

3.3 Entry of a fourth MNO

163. Using spectrum to stimulate a new market entry is the competence of the Member States. The mobile market has been liberalised since the end of the 1990s, by using spectrum licences which have enabled the expansion of network competition. The number of MNOs varies from one country to another and both small and large countries sometimes have three or four MNOs. There is therefore no consensus on

66 In a major departure from this (Spain, Ireland), the European Commission has accepted that national regulators will impose obligations on the wholesale market for access to mobile networks because a collective dominance position was found in that market (a collective dominance position that translates to a refusal to close deals with the MVNOs, for example).

67 The European Commission requested the Cypriot regulator to monitor the market developments closely and to carry out a new market analysis as soon as possible, given the fact that there are elements in the market (entry of a new MNO) which could quickly affect the desirability of regulating this market.

68 The Irish regulator's 'joint dominance' decision in Ireland was dismissed on appeal in 2005. There has been no regulation since.

the ideal number of market players (see also chapter "*4 Effects of a possible fourth mobile operator"*).

164. In any case, the entry of a new player via spectrum is a one-time option that can be offered to the market. After the auction, the licences will be fixed for 20 years. After that, a new entry in the mobile market will only be possible by way of access (MVNO) or spectrum trading (which has been rare or non-existent up till now).

165. Market entry by a fourth player by way of spectrum (and the associated expansion of a network) will, in principle, increase network competition in the mobile market. In contrast to the market analyses for broadband and television, such measures do not concern an intervention that perpetuates the dynamics in the mobile market (with three players and possible MVNOs), but rather an intervention reinforcing directly and immediately competition in that market.

166. Lastly, it should be noted that market entry is always possible, in theory, for a fourth operator. The only element up for discussion is whether or not a spectrum portfolio should be reserved for a fourth player. The other measures (national roaming, relaxing of time schedules, etc.) to the advantage of a major fourth operator, are not disputed.

167. One of the objectives of an auction is after all to let the market speak. In this context, market entry means that a business case must be made before investment takes place. Setting up such a business case before entry is primarily the responsibility of the potential market players. The government can opt to facilitate the entry of a fourth player by imposing accompanying measures. The only reason this option is in the hands of the government (as opposed to the situation in other markets where entry and exit take place without government involvement) is the barrier to entry, in particular the purchase of spectrum needed to roll out a mobile network.

168. Lastly, it should be noted that, given the impending roll-out of 5G technology (see section "*2.2 Future technological evolution of 5G*"), which enables renewed product differentiation, a new market player could speed up innovation and the technological evolution to the advantage of the end user and create value in the sector.

3.3.1 Conditions for a fourth MNO

169. Should it be decided to opt for a fourth player, the necessary conditions will obviously have to be met in order to create a level playing field. For that reason, an equal amount of spectrum was in principle reserved for the existing players as there was for the potential fourth player (except at 700 MHz, see section "*2.3 Reserved spectrum"*).

170. The Royal Decree currently being reviewed by the working groups between private offices of the ministers, contains the following measures for the introduction of a possible fourth mobile player:

- the provision of national roaming from 20% actual population coverage[69];
- temporary exemption from coverage of railways for a period of 9 years;
- discount on the annual fees during the first years of the licence validity;
- a less stringent schedule for the population coverage requirements: the fourth operator should provide coverage, from the starting date of validity of the user rights, for respectively 30%, 70% and 99.5% of the population after 3, 6 and 9 years (as opposed to 70% and 99.5% for the existing operators after 1 and 2 years respectively);
- the provision of reserved spectrum at 700, 900, 1800 and 2000 MHz, the payment of a minimum unique fee being ensured;
- in order to avoid speculative behaviour on the part of candidates, a ban on trading during the first six years of the duration of the licence was introduced for all reserved spectrum.

3.4 Conclusion on options in the mobile market

171. By perpetuating the **current regulatory framework** in the mobile market, the competitive situation will not remain unchanged. The market analysis for the fixed markets for broadband Internet and broadcasting services, currently in a final phase, will have a positive effect on the competitive dynamics for fixed and bundled products, including those with a mobile component. Currently, Proximus and the cable operators (Telenet or VOO, depending on the territory) largely control these fixed markets. The market analysis will have the effect of alternative operators, such as mobile operator Orange for example, being able to compete

69 Exploratory talks with an interested market party revealed that having immediate national roaming without a 20% coverage of the population is a major condition. The 20% rule was included in earlier spectrum auctions too (cf. Royal Decree 3G and Royal Decree 800 MHz). According to this candidate fourth operator, a new market player cannot acquire spectrum in 2019 and not be able to start operating until 2022.

more effectively in a converging market in which bundled products with a mobile component form the fastest growing segment.

172. In time, the market analysis will also have a positive impact on Orange's ability to sustain its position as third player in the mobile market. Other potential entrants can also launch new, bundled products, combining MVNO offers with fixed products such as broadband Internet and broadcasting via the regulated offers. The competitive pressure on the converging market can also result in further impetus in the mobile market. However, the market analysis is not directly aimed at making the mobile market even more competitive.

173. Additional **access regulation in the mobile wholesale markets** is not a realistic option. It is highly unlikely that this will withstand the test of the European framework.

174. **Reserving spectrum** is the ultimate means for the government to allow a new player to enter the market. Naturally, such an approach immediately ensures the necessary dynamics, at least in the short and medium term.

175. However, these entries are not always successful (see section "*3.3 Entry of a fourth MNO*"). Unsuccessful entries are accompanied by the surrendering of the licence and/or a consolidation among the players (see marginal 17).

176. The possibility of using spectrum to introduce more competitive dynamics in the market is however limited, given that licences have a fixed duration. In that sense, decisions have to made now for the next 20 years. The following section discusses the effects of a possible fourth MNO in more detail.

4. EFFECTS OF A POSSIBLE FOURTH MOBILE OPERATOR

4.1 Summary of trends in Europe

177. Austria, Belgium, the Czech Republic, Finland, Germany, Hungary, Ireland, Portugal and Switzerland have three MNOs. In these countries, the mobile spectrum is pretty much evenly distributed among the three operators (see figure 27, the operators with a spectrum share of less than 10%, such as Denseair in Belgium, are not taken into account).

178. Denmark, France, Italy, the Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom have four MNOs.

179. The following figure shows the numbers of MNOs in European countries and the evolution of these numbers. We can see that the number of countries with four MNOs has dropped in recent years from 17 to 12.

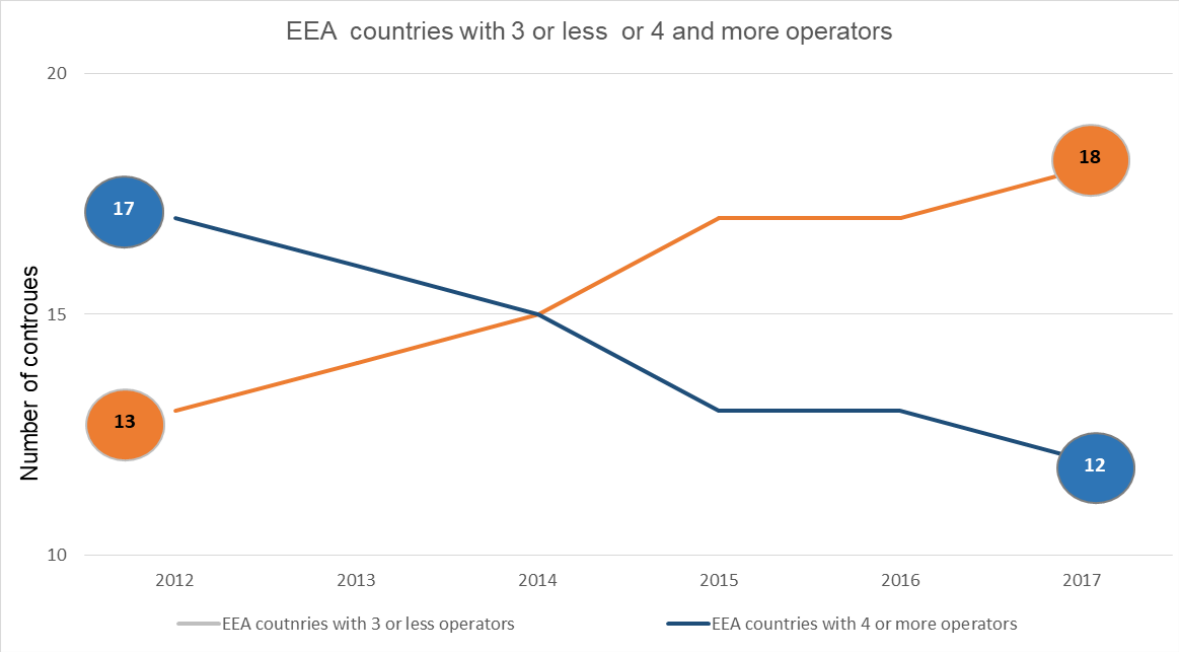

Figure 32: evolution of the number of MNOs in the EU -April 2018 (source: Cullen)

4.2 Impact of a fourth operator in terms of price

4.2.1 Ex-ante analysis of the mergers from 4 to 3 operators

180. In the past, the European Commission has approved various cases where the mobile market reduced down from four to three operators. However, quite recently, there have been a number of cases where the Commission established problems of competition, moving it to impose extensive measures on the parties

involved in order to prevent such anti-competitive effects (as in Ireland, Spain, Austria, Italy and Germany).

181. In recent years, the Commission has been more inclined to take firmer action in allowing mergers to take place. Market concentrations from the past have shown that the remedies available to solve the problems (such as requiring MVNO operators to be allowed onto the network involved) did not always turn out to be successful in preserving competition in the retail market. The trend goes towards introducing more structural remedies (disposing of spectrum, etc.) which have a more permanent basis allowing them to solve the problems without the need for additional measures[70].

182. In two recent telecom concentrations, where the number of players in the market potentially slunk from four to three, the European Commission expressed serious objections to this decrease in the number of players in the market. This prevented the concentrations involved from taking place.

183. In particular, in the case Hutchinson 3G UK / Telefónica UK[71], the European Commission prohibited the take-over of Telfonica O2 by Hutchinson. Both are MNOs in the UK. The take-over would have reduced the number of MNO players in the market from four to three. This would have allowed the new company to acquire a market share of 41%. In its prohibition decision, the Commission expressed the opinion that the market concentration would lead to higher prices and lower quality for the end users, obstruct the development of the network infrastructure and threaten the existence of virtual operators. The Commission

70 See speech EC Commissioner Vestanger, 29 November 2016, https://ec.europa.eu/commission/commissioners/2014-2019/vestanger/announcements/competition-and-investment-telecoms_en:

"But of course, we're always open to ways of restoring the competition that's lost by a merger. And in the Italian case, the companies managed to find one. In that case, the solution was to create a new physical operator, which will serve customers from its own towers, with its own share of the airwaves. That operator is Iliad, which has considerable experience. It already helped to make the French mobile market more competitive, after it entered that market back in 2010. That kind of structural remedy, with a new physical operator, is the best answer to competition concerns. Because it can solve the problem once and for all. But in the British case, the companies didn't find a good remedy. They did offer to let virtual operators use space on the merged company's network. But those operators would have depended so entirely on the new company that they wouldn't have been able to compete effectively. And the remedy did not resolve the structural problems created by the disruption to the current network sharing agreements in the UK."

71 Decision of the Commission M.7612 Hutchison 3G UK / Telefónica UK, 11 May 2016.

regards Hutchison 3G UK[72]as a maverick in the market, because the company succeeded in expanding an "excellent network" with a better coverage than O2[73]and launched innovative products onto the market, such as access to 4G at no extra cost[74] and all that at competitive prices. The incentives to continue to compete aggressively would have been significantly diminished by the intended market concentration. The number of MNOs wishing to offers wholesale services to MVNOs would also have decreased, resulting in a tangible impact on that market.

184. In Denmark too, the merger between TeliaSonera and Telenor failed because the European Commission did not accept the remedies that could have made this market concentration accessible[75]. The press hinted at a price increase as a result of the merger being shot down. However, according to European Commissioner for Competition, Margrethe Vestager, there was a risk that prices would have risen even more if the merger had gone ahead[76].

185. On 12 June 2018, the European Commission announced that it will be investigating more thoroughly a proposed market concentration between T-Mobile and Tele 2 NL, as there is a risk that the merger of these two MNOs will increase prices and reduce choice and innovation for customers[77].

186. In Belgium, due to the market concentration between MVNO Telenet (Liberty Global) and MNO BASE, the European Commission ruled that the two companies, of which BASE is considered to be the most aggressive MNO in the Belgian market, were close competitors "restraining" each other. Since BASE will be taken over by Telenet, and the two are seen as each other's close competitor, the incentive to compete intensely in the market will diminish. To respond to this concern, Telenet was required to commit to a number of measures. The company was to discard 2

72 Hutchison 3G entered the UK market as an MNO in 2003.

73 See consideration 656 and following, Commission decision.

74 The other four British operators at the time offered access to their 4G networks only if the user paid a premium.

75 TeliaSonera and Telenor fail to get Danish merger approved, Reuters, 11 September 2015. See https://www.reuters.com/article/teliasonera-telenor-denmark/update-3-teliasonera-and-telenor-fail-to-get-danish-merger-approved-idUSL5N11H0IU20150911.

76 See https://www.business.dk/digital/vestager-ved-en-fusion-var-mobilpriserne-steget-endnu-mere - 11 December 2015.

77 See European Commission press release IP/18/4141 of 12 June 2018.

BASE client bases (Mobile Kings and Jim Mobile) and conclude an access agreement with Medialaan so that it can develop into a full MVNO.

4.2.2 Post-merger analyses and entries: impact on price levels and products

187. A recent report by BEREC analyses the impact of the mergers that have taken place between operators in the European telecom sector in the last ten years[78]. These mergers can have significant consequences for competition on and the structure of the mobile market, in which there are generally few operators with their own network (between three and five in most cases) and substantial entry barriers.

188. Based on a comparison of the evolution of prices in countries where the mergers have taken place and those where no mergers have taken place, the report reveals that there are clear indications that retail prices for new customers rose after the merger, although the impact on prices varied from one country to another, depending on the market segment.

189. In the case of mergers of MNOs in Austria, Ireland and Germany (mergers between Hutchinson and Orange in Austria in 2013, between Hutchison and Telefónica in Ireland in 2014 and between Telefónica and KPN in Germany in 2014) where four MNOs became three MNOs and the market shares of the three remaining MNOs grew more symmetrically towards each other, BEREC found that in all these cases, the price for the end user rose in the short to medium term[79]. There is insufficient data available on the longer term for two of these countries, while it was found that in Austria, the price increase became insignificant after two years, probably due to the impact of the MVNO players which acquired a larger market share from that moment.

190. In countries where an extra player recently entered the market (France and the Netherlands), prices fell in the short to medium term. In France, since 2012 (the year when a fourth mobile operator entered the market) prices fell by 27%. The biggest fall was in 2013, compared to 2012 (-26% on an annual basis). The price level has stabilised in France in recent years. In the Netherlands, prices fell by 51% from 2012 to 2018. There was a continuing and significant drop in prices in that

78 See BEREC, Report on Post-Merger Developments - Price Effects of Mobile Mergers in Austria, Ireland and Germany, 2018.

79 See BEREC, Report on Post-Merger Developments – Price Effects of Mobile Mergers in Austria, Ireland and Germany.

country up till 2017, followed by an extremely sharp drop in 2018[80]. On top of that, there are new "low cost" brands in these countries and new types of offers have appeared in the market (such as the use of unlimited data bundles). One concrete relevant example is the entry of Free in the French market (see section *"4.2.3.1Market entry of a fourth operator in France*").

191. A study carried out by the British regulator Ofcom confirms the impact that the entry of an additional operator can have on price levels in the market in which it is active. The study concluded that prices in countries with an additional operator are 17 to 20% lower than the average. An important factor is that the new operator really plays disruptive part in the market:

> "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."

192. In the Netherlands too, the market entry of Tele2 in 2012 (after auction) was accompanied by a drop in prices between 2013 and 2016 and a rise in competition, according to the Dutch regulator, ACM. On top of that, the entry of Tele2, still according to ACM, speeded up the roll-out of 4G (in 2014, 4G coverage in the Netherlands was at 100%)[81].

193. If the price level drops significantly, this naturally means a drop in the operators' profits, which in turn can have an impact on dividends and/or investments.

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80 Source: Eurostat. The method used to calculate the index figures varies from one country to another. Since 2014 in Belgium, for mobile telephony, the most consumed products per profile and per provider are considered. The actual client numbers and migration percentages from old to new tariffs are also used in Belgium. This means that the method used in Belgium is more in line with the consumer's actual expenditure. In the Netherlands, only the tariffs of new, still to be taken out, subscriptions are monitored, among which the cheapest rate is considered, in principle (taking into account the duration of the contract). In France too, the cheapest rate per profile and per client is monitored. In these neighbouring countries, it is assumed that the consumer will immediately switch to cheaper tariff plans.

81 ACM, "Advies Multibandveiling 2019", 10 October 2017 (https://www.acm.nl/sites/default/files/documents/2017-10/conceptadvies-multibandveiling-2019-2017-10-10.pdf)

194. In a long-term study by Genakos, Valletti and Verboven, "Evaluating Market Consolidation in Mobile Communications 2017"[82], there was an analysis of the impact on market structures, prices and investments in the mobile telecommunications sector in the 33 countries over the period from 2002-2014. That study concluded that when there is a new market entry, prices drop by roughly 8.6% (this does not take into account the number of operators already present). The study also notes that a market with four operators as a result of an entry has prices that are roughly 15.9% lower than those of markets with two or three operators. However, as indicated below, the entry also has a downward impact on investments per operator (see section 4.3. "Impact on quality and investments"), namely 10.7% (irrespective of the number of operators). Investments per operator in a market with two or three operators are also 18.3% higher than in a market with four operators after entry.

195. Such conclusions cannot be expected to receive unanimous agreement[83]. In 2015, Frontier Economics published a report[84] that contradicted the occurrence of price increases following a merger. They see no evidence that prices are systematically higher in a market with three players as opposed to one with four players. According to Frontier Economics, dynamic efficiencies (as a result of investments) are more likely to be the driver of falling prices and improved quality, in particular concerning mobile data. It should be mentioned that that study was commissioned by the GSMA.

196. However, in its 2018 national report on Germany[85], the OECD recommends that the German government make use of the impending auction of radio spectrum for 5G to promote newcomers in the market. According to the OECD, a greater number of mobile operators would result in more innovative services at lower prices, given that a higher degree of competition would stimulate the demand for high-speed broadband services and lead to lower market entry prices by means of scale advantages. This recommendation is based on an OECD study of 2014 (Wireless

82 Christos Genakos, Tommaso Valletti and Frank Verboven, Evaluating market consolidation in mobile communications in Economic Policy, Oxford Academic, volume 33, Issue 93, 1 January 2018, p. 45-100

83 Houngbonon, Georges Vivien, The Impact of Entry and Merger on the Price of Mobile Telecommunications Services, Econstor, May 2015, pages 1-41

84 Assessing the case for in-country mobile consolidation. A report prepared for the GSMA, February 2015. The GSMA is an association promoting the interests of mobile operators worldwide.

85 http://www.oecd.org/eco/surveys/economic-survey-germany.htm

Market Structures and Network Sharing[86]) which states that in countries with a high number of active MNOs, there is a greater likelihood of the introduction and maintenance of more competitive and innovative services.

197. According to the OECD, a greater number of MNOs is often the source of innovative offers that challenge existing players and are a motivation for the whole market to become more competitive. As a result, all operators, both MNOs and MVNOs, are encouraged to improve their offers in terms of price, content, transparency and quality. Concerning regulation, maximising the number of network operators is preferred, but in cases where it is economically infeasible to create a new network, encouraging network sharing can also lead to more market players and therefore result in savings which can be channelled back to the consumer more easily than in the case of savings by way of mergers.

4.2.3 Concrete examples of entry of a fourth operator in the market

4.2.3.1 Market entry of a fourth operator in France

198. The granting of a mobile licence to a fourth operator (Iliad, operating under the brand name Free), was the answer to the competition situation at the time. Prices were experienced as being high (see figure 8) and the three mobile operators had sanctions imposed on them by the competition authority due to an illegal regulation[87].

199. The fourth mobile licence was granted to Free in January 2010 and Free entered the market in January 2012.

200. According to a study on this subject, carried out in 2017[88], one of the direct consequences was that the three existing operators launched new brands in the three months previous to Free's market entry. Without expressing an opinion about the total advantage, the authors believe that the market entry of a fourth operator resulted in an increase in the consumers' advantage, with lower profits for the existing operators as a consequence. A description of this study can be found in Annex 4.

86https://www.oecd-ilibrary.org/science-and-technology/wireless-market-structures-and-network-sharing_5jxt46dzl9r2-en

87 Landier et Thesmar, L'impact macro-économique de l'attribution de la quatrième licence mobile, 4 November 2012.

88 Bourreau, Sun and Verboven, Market Entry and Fighting Brands: The Case of the French Mobile Telecommunications Market, 2017.

201. The European Commission's Digital Scoreboard shows that the market entry of Iliad has had a significant impact on the French mobile market, in particular a decrease in the market share of the operator with the largest market share and a drop in the average mobile ARPU (see also Annex 4).

4.2.3.2 Market entry of a fourth operator in Italy

202. In Italy, the European Commission made a general assessment on the fourth operator[89]. Obligations were imposed on the existing parties (HUTCHISON 3G ITALY / WIND) to allow the new operator (ILIAD/Free) to enter the market. To that end, a certain amount of spectrum had to be transferred by the existing parties to the new operator.

203. Iliad's effective launch in the Italian market is quite recent (May 2018). It was also almost immediately characterised by offers that were considerably more attractive than those previously seen in that market[90].

4.3 Impact on quality and investments

204. The market entry of a fourth operator will diminish the market shares of the historic operators and see their operational results fall, obliging them, de facto, to reduce their costs. In that context, and taking into account the probable impact on their market capitalisation and their financing capacity, a hypothesis is that they will probably have to limit their capital expenditure (CAPEX).

205. In theory, the access of a newcomer to the historic operators' network, whether by negotiation or imposed agreement on national roaming, should make the historic operators less enthusiastic about continued investment in order to differentiate themselves in terms of quality. Although the operators will have the necessary spectrum to cope with the constant increase in the use of mobile data, it is possible that they will no longer have the same economic incentives to continue to invest relatively heavily in order to distinguish themselves in terms of quality of client experience. For example, the current very high level of quality on the 4G networks, could be influenced in the medium term by the entry of a fourth operator.

89 Case M.7758 – HUTCHISON 3G ITALY / WIND / JV

90 For example, there was an offer of 30 GB available data for 5.99 euros, while considerably less interesting offers in the Italian market are also more expensive.

206. No considerable reduction in the level of quality of client experience is expected in the short term Belgium when looking at a market with four operators. The spectrum resources should still be sufficient to cope with the increase in traffic. Measures aimed at increasing transparency of the network quality (coverage atlas, measurement of the quality of the client experience and measurements in the field through the application of crowd sourcing) could play an important role in that respect. Despite a possible tendency towards degradation and taking into account currently good performances, Belgium should, in principle, be able to maintain a good level of quality.

207. It is important to know whether investments in mobile networks would also be influenced by the market structure and in particular the number of players. Conclusions in that area vary from one study to another, and in particular depending on the commissioning parties.

208. On the one hand, various studies show that investments per operator decrease with the number of operators, particularly in the symmetrical markets.[91] Investments in those markets are said to increase in the short term in proportion to the number of operators but in the long term, ultimately decrease. The relation between the degree of competition and the investments would therefore be characterised by a U-shaped curve. In the long term, the expectation is that investments will decrease when the increasing size of the market makes it impossible to continue to compensate for the loss of market shares of each player. This decrease in market shares is a direct result of the rise in the number of operators, while the increase in the size of the market is in turn indirectly related to a greater pressure on the resulting prices.

209. However, there are other studies that show that there is no real connection between an even greater concentration in the market and an increase in investments[92]. According to these studies, investments are inclined to follow long-term cycles that seem to be mainly independent of developments in connection

91 We quote, for example, from: Jeanjean Vivien Houngbonon, 2017, Market structure and investment in the mobile industry, Information Economics and Policy 38 (2017) 12–22; Grajek, M., Roller, L.-H., 2012. Regulation and investment in networks industries: evidence from European telecoms. J. Law Econ. 55 (1), 189–216.; Schmutzler, A., 2013. Competition and investment – a unified approach. Int. J. Ind. Organ. 31, 477–487

92 Example: WIK-Consult, Competition & investment: An analysis of the drivers of investment and consumer welfare in mobile telecommunications, 2015.

with the market structure. The assumption is that investments are more likely independent of consumer demand (effect of Netflix), cost drivers and spectrum conditions.

210. Other studies conclude that even if the more concentrated markets do lead to larger investments per operator, they do not guarantee more investments in the market as a whole.[93] As far as that is concerned, it is important to note that the investments in the French market have increased, in absolute terms, since the entry of Free, from 6.3 billion to 9.6 billion euros in 2017. It should also be emphasised that the weight of these investments could be one of the reasons why there is sometimes a return to three operators (news of talks between Bouygues and SFT was reported in the press recently).

211. Logically speaking, a fourth player in Belgium would also operate in the bundles market (mobile + fixed telecom products) since this is the growth segment among the existing operators. Therefore, should the existing competitors want to retain an interesting offer, they will also have to continue investing in their mobile networks so that their total churn is not dependent on the performance of their mobile networks. In that respect, we can assume that extra competition will not immediately have an adverse effect on investments.

212. If the operators want to be ready for the arrival of the IoT[94], they will be obliged to continue investing in their mobile networks.

213. The high EBITDA margins of Proximus and Telenet as convergent players also show a certain margin within which competition at lower prices is possible, without it necessarily being at the cost of capital investments. In the last few years, Orange has registered a falling EBITDA margin and cannot presently benefit from the profitability of their convergent product, but this is expected to change in the future, due to the measure imposed in the context of the BB&TV market analysis.

214. On the one hand, various studies show that investments per operator decrease with the number of operators, particularly in the symmetrical markets.[95]

93 Genakos and Valletti, Evaluating Market Consolidation in Mobile Communications, 2018.

94 Internet of Things

Investments in those markets are said to increase in the short term in proportion to the number of operators but, in the long term, ultimately decrease. The relation between the degree of competition and the investments would therefore be characterised by a U-shaped curve. In the long term, the expectation is that investments will decrease when the increasing size of the market makes it impossible to continue to compensate for the loss of market shares of each player. This decrease in market shares is a direct result of the rise in the number of operators, while the increase in the size of the market is in turn indirectly related to a greater pressure on the resulting prices. This analysis is endorsed by the advice of financial analysts who expect that the decrease in total revenue in the market will bring a drop in employment and in the CAPEX of the Belgian operators.

215. That does not change the fact that ACM did not take account of such an impact on investments supporting a consolidation. On the contrary, according to ACM, the entry of Tele2 in the Dutch market speeded up the roll-out of 4G, for example. Neither did ACM find any unfavourable connection between competition and investments. The consolidation from four to three MNOs in Germany did not lead to an improvement in the network quality.

4.4 Stability of a fourth operator in the long term

216. An Analysys Mason study, commissioned by BIPT[96], calculating the value of spectrum, made the following recommendations:

> *"For the award of the 700MHz and the 1400MHz bands in Belgium, we do not recommend that any spectrum be reserved for potential new entrants, for the following reasons:*

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95 Based on various hypotheses, HSBC predicted that the total revenue in the Belgian telecom market would show an average annual growth percentage of -5% between 2019 and 2025, as opposed to +1% if the market were to stay with only three players. HSBC predicts that the operators would have to make cuts in staff and the CAPEX. It notes that the lower valuation of the operators' shares and the lack of predictability could discourage investors. And that in turn could result in pressure on the financing capacities of the operators being increased, so that they would be obliged to cut their costs even more. See HSBC, Belgian Telecoms EQUITIES TELECOMS, The perils of a fourth operator, 19 June 2018.

96 Communication by the BIPT Council of 25 January 2016 regarding the results of the Analysys Mason study on the value of the spectrum for public systems - http://bipt.be/En/operators/radio/rights-of-use/communication-by-the-bipt-council-of-25-january-2016-regarding-the-results-of-the-analysys-mason-study-on-the-value-of-the-spectrum-for-public-systems

· The likelihood of new entry in the market is extremely low, and this is reinforced by the fact that previous attempts have failed (i.e. Bidco's fourth 3G licence).
· The mobile market in Belgium is saturated and competitive, reducing the likelihood of interest in the market from new entrants.
· Given that there are already three MNOs and another company (VOYACOM) with significant spectrum holdings, it is unlikely that a new entrant would be able to develop a profitable mobile business in the long term.
· The amount of the 700MHz and 1400MHz bands that will be awarded is limited and we believe that existing MNOs will all want to acquire a fair amount in these bands.
· Many spectrum reservations in other European countries did not lead to a positive outcome."

217. The statements made by Analysys Mason in that report need to be nuanced. First and foremost, and in the current circumstance, a serious player has expressed interest in the Belgian market (even though this interest is regarded as confidential). And though the Belgian mobile market may not have any big competition problems, it has been established that the prices were mostly higher than the benchmarks and that the use of mobile data remained reasonably low. These characteristics could present opportunities for a newcomer. The text above also clarifies that there was sufficient spectrum for four operators. The business plan is naturally the responsibility of the interested operator. However, there are certain measures that can be taken to guarantee a level playing field for the newcomer.[97]

218. A fourth operator is less profitable on entry than existing operators in the market[98]. This means it will have to build up its costs structure more efficiently, which can have consequences in the longer term. The consolidation move of recent years points in this direction (see section "*4.1 Summary of trends in Europe* ") even though the entries of new MNOs have to be taken into consideration (in France, Italy and the Netherlands, for example). The likelihood that the entry of a fourth

97 See section "3.3.1 Conditions for a fourth MNO"

98 A study by Arthur D. Little shows that the last newcomers in a market with four operators in 2013 have an ROCE after taxes of almost zero throughout the first years, even if the situation may improve fast as their market shares increase. No more recent data is available from this study.

player can result in time in renewed consolidation from four to three players could therefore be real[99].

219. Depending on the spectrum conditions, a new player can obtain a lower spectrum price, be given limited coverage obligations and possibly access to national roaming. This implies that a newcomer can compete with existing operators in the first years, with only limited investment costs, enabling it to launch a financially interesting offer in the market. However, the effect is less measurable in the medium term, and it is equally uncertain in practice whether the arrival of a fourth player will actually bring more competition in the longer term.

4.4.1 Impact on the entire Belgian telecom market

220. It was noted in section "*1.1 Market shares and* convergence" that the Belgian market was characterised by a strong convergence, in particular by a strong take-up of the bundles and a strong increase in the quadruple-play offers. This makes it appropriate to analyse the impact of a fourth mobile operator in a broader context than solely the mobile market.

221. The baseline scenario without a fourth player is a telecom market consisting of three large converging players: Proximus, a cable operator (Telenet, Brutélé or Nethys depending on the region) and Orange. Proximus and Telenet are fully integrated fixed/mobile operators, Brutélé and Nethys still have to become full MVNOs on Telenet/BASE's network and Orange will enjoy measures introduced by the analysis of the broadband and broadcasting markets (access to cable and later, undoubtedly, to Proximus' FTTH network).

222. Compared to that baseline scenario, various scenarios are being proposed in the case of a fourth operator in the mobile market:

223. In the most favourable scenario, the newcomer in the mobile market will also enter the fixed market at a later stage, via access to cable or Proximus' network. This could also cause extra pressure on competition in the fixed market, provided that that this new player can acquire enough scale and therefore enough clout.

99 The European Commission has been trying to reverse this trend towards concentration in its concentration rulings of recent years (see section "4.2.1 Ex-ante analysis of the mergers from 4 to 3 operators ")

224. In another scenario, the new mobile player will weaken the existing mobile player without a fixed network to such an extent that it will be taken over in the longer term, by the newcomer, for example. Whether the latter can also put additional competitive pressure on the fixed market will then again depend on its clout.

225. In a third scenario, the newcomer will partially weaken the existing mobile player without its own fixed network, but neither party will have sufficient critical mass to put enough pressure on competition in either the mobile market or the fixed market.

226. In a last scenario, the newcomer fails to enter the mobile market and there is therefore no possibility of entry in the fixed market.

4.4.2 Comparison with previous entries in the Belgian mobile market

227. In the recent past, various operators acquired spectrum in Belgium without that resulting in the actual roll-out of a fourth mobile network.

228. In 2011, **Telenet and Nethys (together: "Bidco")** applied for a licence for mobile spectrum. At the time, spectrum was reserved at 900, 1800 and 2000 MHz. Due to a number of factors, including lack of commercial RAN agreements, the restricted access to the masts and the long processing times for building permits in the different regions, Telenet and Nethys returned their licence.

229. In response to the auction of the 2600 MHz band, user rights were granted to **DATANG** (BUCD, later VOYACOM) in 2012. This firm was taken over in 2017 by AIR SPAN./Dense Air Belgium. This does not concern a network with national coverage but rather an operator offering their services to the classic mobile operators (B2B) with the aim of improving indoor coverage.

230. **Broadband Belgium** recently acquired user rights in the 3600 MHz band. In 2017, however, this operator returned the licence following a divestment decision of the shareholders[100].

100 Decision of the BIPT Council of 27 June 2017 repealing the Decision of 21 March 2017 concerning the extension of the rights of use of Broadband Belgium

231. In the light of the foregoing, one might wonder whether a new allocation of spectrum to a fourth operator could succeed this time. However, it should be noted that the above-mentioned interest of DATANG and Broadband Belgium in entering the market for mobile telephony does not compare with the market party or parties now expressing interest. Although the identity of the market party has not been made public, it is clear that it concerns an operator with a proven track record in a large, mature market for mobile telephony. Moreover, this market party has the necessary resources and commercial expertise to make the entry in the Belgian market possible. Lastly, the spectrum package that would now be offered is complete, meaning there would be no structural shortcomings to offering services in the various technologies necessary to serve the Belgian market.

232. These are elements that were absent, or present to a lesser degree in the aforementioned cases, making it impossible to compare those cases with the present interest. Nevertheless, the example of Bidco (an existing joint venture between Telenet and Nethys, with a fixed network and a substantial number of MVNO clients) shows that the roll-out of a mobile network is not self-evident once the licence has been purchased.

4.5 Conclusion about the effects of a possible fourth operator

233. Based on a few experiences in other countries of a fourth player entering the market, prices for mobile telephony are expected to fall, certainly in an initial phase.

234. What the impact on general levels of investment and quality will be is less clear. There are conflicting studies on the global level of investments. There are indications that the level of investment by the existing operators will be under pressure. Given that investments in the mobile sector are actually dependent on investment cycles, for example because of technical evolutions such as 3G, 4G or 5G, it is difficult to predict the effect the number of players will have on investments.

235. One can expect more innovation from increased competition, as foreign examples demonstrate. Lower profits mean that operators may invest less in zones where there is no competition (coverage of rural areas, for example) or cut costs in quality.

5. CONCLUSION OF THE IMPACT ANALYSIS

236. The mobile market is characterised by competition through infrastructure between three mobile operators. In contrast to the fixed market, which has only two network operators, the Belgian mobile market is not characterised by big problems of competition that demand or simplify an ex ante intervention. Up till now, the MNOs have made commercial access agreements with the MVNOs. So it is not a question of refusing market entry. The merger between Telenet and BASE, however, has meant the disappearance of an important full MVNO, which was good for between 8% and 10% of the market, and which had made the market more dynamic with its entry.

237. The prices have shown a downward trend since 2006 (60% drop) as opposed to the prices of fixed services. However, these prices stabilised in the period from mid-2015 to mid-2017. A number of studies indicate that prices in Belgium for mobile services are higher than in neighbouring countries. This claim is being checked in particular for offers of larger mobile data volumes (2GB and more). That price level, combined with good availability of Wi-Fi might explain why the Belgian user consumes relatively little mobile data. The take-up of mobile broadband in Belgium is lagging far behind compared to the European average (72% compared to 88% in France and the Netherlands, for example: see figure 16).

238. The coverage and quality of service, in terms of speed and latency for example, are good, very good in fact. And consumers experience these aspects as such: they are generally satisfied with the quality of the service. Competition on quality was further stimulated by the measures proposed by the regulator in recent years (in particular, the mapping of the mobile networks in order to be able to compare the operators' coverage).

239. Thanks to the auction, extra spectrum will be available in the market, including the most interesting part which is spectrum below 1 GHz, increasing by 30%. At the same time, this is a one-time opportunity in the coming twenty years for a new player to enter the mobile, and probably also the fixed market, thanks to the regulation of broadband Internet and broadcasting services in that fixed market, currently being completed by the CRC.

240. Even with a fourth player, extra spectrum will be made available to the existing players due to the new bands (although there is loss of spectrum in bands such as the 900 and 1800 MHz bands). In addition, there is spectrum that is presently being underused (in the 2600 MHz band, for example). The continued exponential growth of mobile data expected in the coming years will therefore be partially absorbed by the underused spectrum, the extra spectrum provided by the imminent auction and the future spectrum (26 GHz) and partially by the construction of extra masts. Notwithstanding the increase in mobile data, there is

therefore sufficient spectrum available to allow frequencies to be allocated to a fourth mobile operator.

241. The existing operators will however have to adapt to the new situation after the auction. The potential loss of spectrum in the 900 MHz band could lead to a reduction in capacity for existing services (2G, 3G or 4G) in the rural areas for at most, one of the existing players. For 5G, one of the three players, just as the newcomer, will have only 5 MHz in the 700 MHz band instead of 10 MHz. This will reduce the bit rate capacity of these operators in rural areas (and "deep indoor" coverage). However, this reduced capacity can be absorbed by other bands, as long as other technologies have already been stopped (3G for example). Lastly, it should be noted that temporary problems with quality may occur during the migration.

242. One of the greatest challenges for a fourth operator will be obtaining the necessary building and environmental permits for the sites, pylons and antennas. Obligatory site sharing will solve only some of the problems. The processing times for obtaining a building permit for new pylons are relatively long. The 5G technologies mean that new pylons will be necessary, even without the entry of a fourth player in the market.

243. The current radiation standards for the Brussels Capital Region create an additional barrier (a barrier that, incidentally, already exists for the further roll-out of 5G by the existing operators). An alternative could be some form of network sharing. That can be agreed only on a commercial basis, in principle. However, strengthened competition may make network sharing the ultimate means for operators to cut their costs.

244. Although the Belgian market is not characterised by big problems of competition, that does not rule out the fact that competition can be strengthened. BIPT is currently working on increased transparency, such as the possibility of comparing prices at www.besttariff.be, the coverage maps and the quality barometer. In addition, the regulation of access to the fixed broadband and television markets should enable the mobile operators (without their own fixed network) to survive in a market that consists more and more of bundles (including quadruple bundle with a mobile phone component, which is the fastest-growing segment). However, regulating access to the mobile market is not realistic, given that the conditions for such regulation have perhaps not been met and that it has been years since the mobile market disappeared from the European Commission's list of markets susceptible to ex ante regulation. Neither is regulating retail prices in the mobile market a realistic option, according to the current regulatory framework (regardless of whether or not this would be desirable).

245. So, a fourth operator could play a part in further sharpening competition. Based on a few experiences in other countries concerning the entry of a fourth player in the

market (France, the Netherlands, Italy), prices for mobile telephony are expected to fall, certainly in an initial phase. We also notice that newcomers often bring new price formulas and services into the market causing existing operators to adapt. One typical response by existing operators is to introduce cheap tariff formulas in the market to counter the entry of the new player. Conversely, there are studies (including by BEREC) that show that consolidations from four to three operators in other countries have led to price increases.

246. What the impact on general levels of investment and quality will be is less clear. While there are conflicting studies on the global level of investments, there are indications that the level of investment by the existing operators will come under pressure. That is certainly the case with an operator whose profits are rather low compared to those of its competitors.

247. Investment decisions in the mobile sector depend on the investments cycles associated with the various technological evolutions (3G and 4G). This makes it difficult to predict any possible effect of the number of players on investment.

248. The effect on the level of quality is twofold. On the one hand, increased competition can be expected to result in more innovation. For example, according to ACM, the roll-out of 4G in the Netherlands was speeded up by the market entry of operator Tele2. The OECD, too, recently urged Germany to increase network competition (Germany has three MNOs after a consolidation from four to three), not only in terms of price competition but also to achieve more innovation in the market. On the other hand, lower profits can also mean that operators will invest less in zones where competition is not present (for example, coverage in rural areas) or will cut costs in quality as a response to the price competition. Concerning the first point, it should be noted that coverage requirements linked to the licences can ensure adequate coverage.

249. BIPT did not initially predict the interest of a fourth player, given that no concrete interest had been expressed by new players with regard to the purchase of new spectrum. Moreover, the trend in recent years was more towards consolidation from three to four (network) operators. As far as the first point is concerned, there clearly appears to be interest from the market in the purchase of spectrum in Belgium, following consultation, as long as the portfolio and conditions for entry are realistic. It should also be noted that the consolidation trend is still viewed with suspicion by the European Commission. Consolidations are sometimes subjected to conditions to make the market entry of a new player easier (with or without relinquishing spectrum) to avoid any decreased competition that could result from the consolidation. In more recent decisions, the European Commission's response has been much stricter, refusing mergers in the United Kingdom and Denmark, for example, after it turned out that the remedies offered in other cases had not always been successful enough to preserve competition

(price increases) in the market. This could mean that the consolidation trend will slow down in the coming years.

250. In any case, should it be decided to give a fourth player the opportunity of entering the market, the necessary conditions will of course have to be met in order to create a level playing field. In addition to a package of reserved spectrum (700, 900, 1800 and 2000 MHz), there must also be provision of national roaming and there will have to be a less stringent time schedule for the coverage obligation.

251. Lastly, it should be noted that the opportunity for a fourth player to enter the market is only an option which ought to be left at the discretion of the market. The decision to be made here comes down to leaving open the possibility of a potential entry, should there be sufficient commercial interest. It is not about imposing a possible entry. Should there be no interest, in the end, due to the barriers and difficulties described above, for example, the existing operators will remain with the complete package of spectrum. And should it turn out, in case of entry of a fourth player, that the market cannot support four players, a consolidation will follow, bringing the market back to three players.

Annex 1: Summary of historic granting of mobile licences

252. In the 1990s, the government granted three 2G licences (900 and 1800 MHz bands) to the three existing operators. The 2G licences were initially to be valid for a period of 15 years. These 2G licences could be tacitly renewed for periods of five years.

253. In 2001, the government granted three 3G licences (2000 MHz band) to the same three existing operators. The 3G licences were initially to be valid for a period of 20 years. These 3G licences could be tacitly renewed for periods of five years.

254. In 2007, the government authorised the roll-out of 3G in the 900 MHz band.

255. In 2010, the government decided to time the end of the validity of the 2G licences with that of the 3G licences and to no longer extend them after the initial term of validity of the 3G licences.

256. In 2011, BIPT granted a fourth 3G licence to Telenet Tecteo BidCo. This licence was returned in 2014.

257. In 2011, BIPT authorised the roll-out of 4G in the 1800 MHz band.

258. In 2012, BIPT granted four 4G licences (2600 MHz band) to the three existing operators and a fourth, Chinese, operator whose Belgian daughter company was called Voyacom. Since the roll-out of 4G had already been authorised in the 1800 MHz band, the 2600 MHz band has remained largely unused.

259. In 2013, BIPT granted three 4G licences (800 MHz band) to the same three existing operators.

260. In 2018, the American group Airspan took over Voyacom. Under its new name, Dense Air Belgium, the company will not be targeting the general public, but instead will offer to make the networks of the existing mobile operators denser.

261. So today, there are three operators in the Belgian market that are targeting the general public. These three operators have each rolled out three networks: 2G, 3G and 4G.

Annex 2: Overview of the decisions of the European Commission concerning recent concentrations of mobile network operators

Date of the decision of the Commission	Country	Parties	Conclusion	Prohibited/allowed providing there are remedies/allowed	Comments
/Pending 2018	The Netherlands	T-Mobile NL/Tele2 NL	Investigation is pending: Commission has objections and has opened a thorough investigation		
01 September 2016	Italy	**Hutchison 3G Italy/Wind**	concentration from 4 to 3 MNOs: Loss of competitive pressure in the market/price increases	Allowed providing there are remedies	Selling spectrum/antenna sites/obligatory sharing agreements to a new market entrant so it can become an MNO
11 May 2016	UK	Hutchison 3G UK / Telefónica UK	concentration from 4 to 3 MNOs: Risk of higher prices, decrease in quality, obstacle to development of infrastructure / hinder in wholesale market for MVNOs	Prohibited	
04 February 2016	Belgium	Liberty Global/BASE Belgium	Liberty Global (Telenet) (MVNO) took over BASE (MNO) Risk of price increases due to 2 important competitors merging into 1.	Allowed providing there are remedies	Selling 2 smaller BASE client bases / These should become full MVNOs

19 May 2015	Spain	Orange/Jazztel	Orange (MNO) that took over Jazztel (MVNO) Significant risk of deterioration in competition conditions in the market for fixed telecom services. Also a risk in the mobile market.	Allowed providing there are remedies	Orange had to sell a part of the FTTH network / Obligatory offer of wholesale access / Orange must give this new player access to its mobile network
2015	Denmark	**TeliaSonera/Telenor /JV**	concentration from 4 to 3 MNOs: Risk of higher prices, loss of innovation, high market concentration and reduction in quality of services.	Prohibited / Retracted by the parties	The parties shelved their market concentration plans because they could not reach an agreement with the EU about the remedies to be offered.
28 May 2014	Ireland	Hutchison 3G UK/Telefónica Ireland	concentration from 4 to 3 MNOs: Elimination of an important network player: risk of price increases / possible problems in the wholesale markets	Allowed providing there are remedies	Obligatory admittance of 2 MVNOs on the network The EU wanted spectrum to be sold to create a new fourth MNO in the market
20 September 2013	Germany	Vodafone/ Kabel Deutschland	Vodafone (MNO) that took over Kabel Deutschland (MVNO) No competition issues since there are still 3 MNOs and several MVNOs in the market	Allowed	

12 December 2012	Austria	Hutchison 3G Austria/ Orange Austria	concentration from 4 to 3 MNOs: Significant drop in incentives for aggressive competition, strong likelihood of price increases, increased threshold for entry in the market	Allowed providing there are remedies	Sale of radio spectrum to a new market entrant (=> there was no interested party at the subsequent auction of this spectrum) / Obligation to offer wholesale access

Annex 3: Commercial strategies concerning multiplay offers with a mobile component

262. The integrated operators apply certain strategies to keep mobile-only operators out of the market. The following are some examples from Telenet, VOO and Proximus which illustrate this: in general, it can be said that mobile calls in the context of a bundle can contain a tariff advantage for the customer and/or an advantage in the form of better features of the product.

263. A new customer can choose from three options when (s)he wishes to take out a mobile subscription with Telenet:

- Mobile subscription only "Price according to consumption";
- Mobile subscription only "King" (15 euros per month) and "Kong" (25 euros per month);
- Mobile calls in the context of a quadruple-play offer - WIGO;

264. Although the mobile element of the WIGO offer, on the one hand, and a stand-alone mobile tariff formula, on the other hand, are not completely comparable in terms of the specifications, buying mobile telephony in the context of a bundle does seem to be an interesting option. That can be illustrated with the help of a WIGO 3GB, for which the subscription costs 100 euros. If we add up the prices of a Kong subscription (25 euros) with that of a Whoppa triple play (79.48 euros), the total costs come to 104.48 euros. In such a case, the customer has 1 GB less data than with WIGO 3GB, but the credit can be divided between two SIM cards. Furthermore, in the context of a bundle, mobile calls are unlimited. Should the customer choose a stand-alone mobile subscription, a tariff of 0.20 euro per minute is charged outside the calls package. Whoppa combined with King (15 euros) is less expensive than a WIGO 3GB (global monthly costs of 94.48 euros), but the customer receives 1.5 GB less in data and only 150 call minutes. For an extra payment of just over 5 euros, WIGO 3GB is a considerably less expensive product.

265. The purchase of mobile telephony in the context of a WIGO bundle is in any case cheaper than the "price according to consumption" option, even if the actual consumption is moderate. A consumption of 30 call minutes and 500 GB in mobile data would in that case correspond to a monthly cost price of 80 euros.

266. We read in the financial reporting of Telenet that it attributes a larger part of discounts related to WIGO to mobile revenue, clear confirmation of the company's tariff strategy.

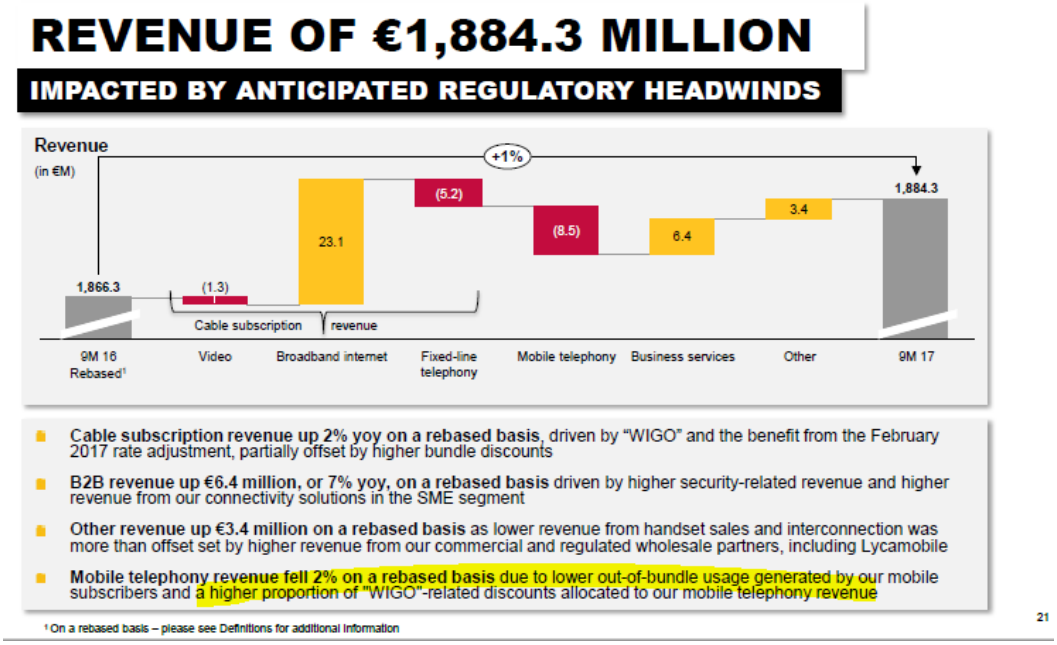

Figure 33: income reporting Telenet Q3 2017 (source: presentation of quarterly report Q3 2017)

267. VOO offers the quadruple-play product One for a monthly price of 95 euros. One's mobile element offers the end user an unlimited call volume and 2 GB data. If a customer chooses a combination of the triple-play product, which has the same value at the Trio Tattoo (86.95 euros) and the stand-alone mobile subscription Wahoo (300 call minutes and 2 GB data for 22 euros per month), that would come to a total of 108.95 euros. Even in combination with a mobile subscription from BASE Toudoo (150 call minutes and 1 GB data for 12 euros per month), the total price (98.95 euros) would be higher than that of a One subscription. During the launch phase of its product, One, VOO promoted its product, for one year, by offering a free mobile phone, worth 144 euros.

268. The advantage for a Proximus customer buying mobile telephony in the context of the quadruple play product Tuttimus, is not to be found in the financial aspect, but rather in the availability of a much larger data volume and a larger number of call minutes. Tuttimus 3 GB provides 3 GB data while the mobile subscription formula linked to Mobilus S offers only 1.5 GB. The data volumes of Tuttimus 10 GB and the stand-alone mobile tariff plan linked to Mobilus M consist of 10 GB and 5 GB respectively. A Tuttimus 10 GB customer can moreover make unlimited calls while the call volume included in Mobilus M is limited to 300 call minutes.

Annex 4: Study of Market Entry and Fighting Brands: The Case of the French Mobile Telecommunications Market

269. In countries where an extra player recently entered the market (France and the Netherlands), prices fell in the short to medium term (see section "*4.2.2 Post-merger analyses*"). One concrete relevant example is the entry of Free in the French market.

270. Here, one of the direct consequences was that the three existing operators launched new brands in the three months before Free's market entry. These alternative brands directly targeted the low-cost market segment subsequently targeted by the newcomer. The graph below illustrates the resulting drop in prices. The launch of the alternative brands does indeed coincide with the arrival of Free. In turn, prices of existing brands fell reasonably slowly, with the exception of those of Orange, which remained stable. According to the aforementioned study, prices of the MVNOs also fell considerably.

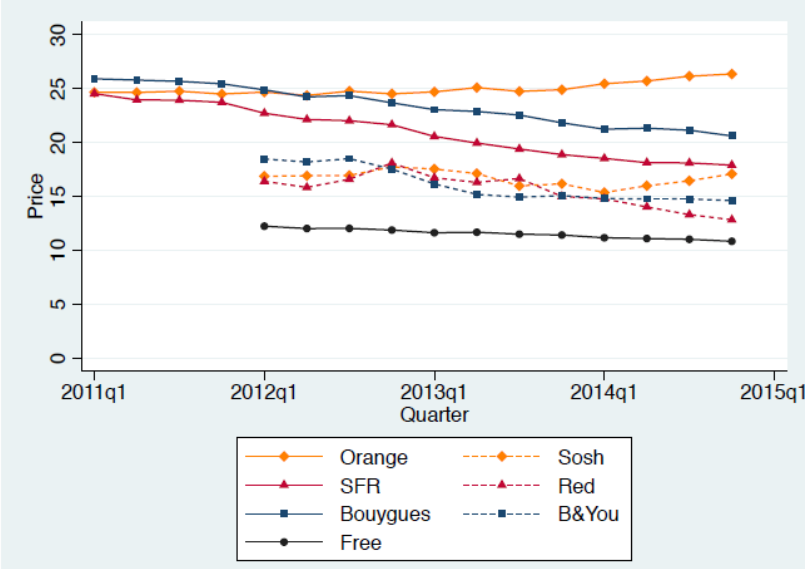

Figure 34: price evolution in the French mobile market (source: Bourreau, Sun & Verboven)

271. The entry of Free in the French market has also had a strong impact on the competition dynamics, as the figure below illustrates. Indeed, all historic operators have seen their market shares fall substantially. The impact of market entry by a fourth player to the consumers' advantage is estimated to 5.1 billion euros between 2011 and 2014. Moreover, this calculation does not take into account the possible rise in wholesale and retail prices which could have occurred had Free not entered the market.

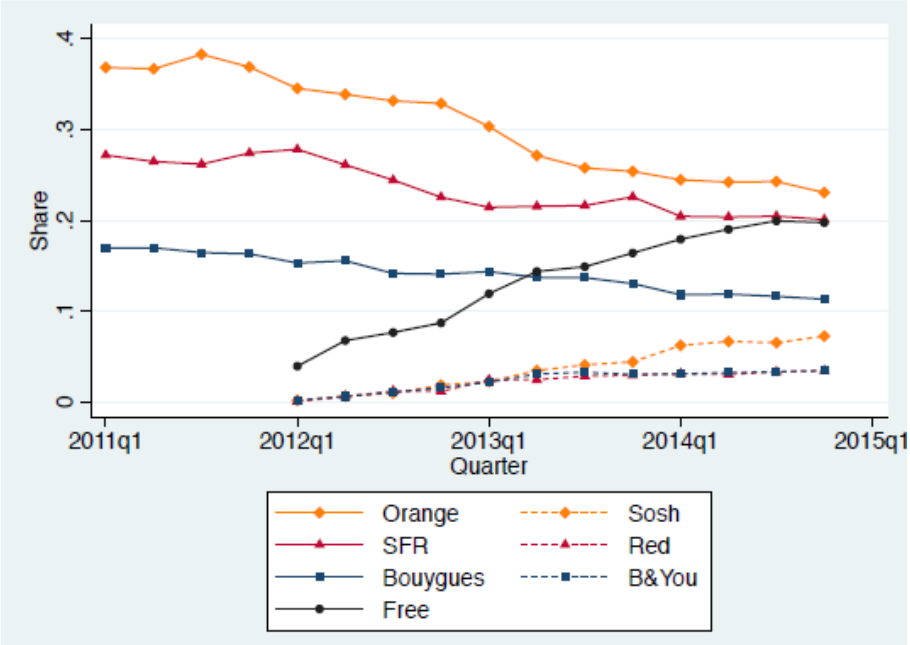

Figure 35: evolution in market shares in the French mobile market (source: Bourreau, Sun & Verboven)

272. Concerning the advantage to producers, the impact of the market entry of Free was estimated at a loss of 3.7 billion euros for all operators as a whole (including the MVNOs) in both the wholesale and the retail markets. That means that the market entry of a fourth operator has generated a positive net consumer advantage, resulting in lower profits for the existing operators. The study also makes no comment about the total advantage given that the entry of Free profoundly changed the market structure. That change in the structure produced a change in the operators' strategies particularly in terms of quality and investments. That change in the structure of the supply has had significant consequences, in particular a drop in prices, an increase in consumption, a fall in activity, profits and employment for the three historic operators, an increase in activity and employment at Free and a variation in the State's revenue.

273. Researchers therefore carried out a cost-effectiveness analysis of the market entry of the fourth operator. According to a publication in 2014, the arrival of Free

translated to an annual profit of around 1.2 billion euros for the consumer[101]. At the same time, the authors emphasise that this profit was compensated for by a loss of around the same amount for the producers. Furthermore, it was accompanied by an annual loss of around 0.4 billion euros for public finances. It should be noted that this calculation does not take into account the government revenue generated by the sale of a fourth licence.

101 For example, Pierre-Alexandre Kopp, Rémy Prud'homme, L'introduction de Free sur le marché des mobiles : essai d'analyse coûts-bénéfices

Annex 5: Comparison quality of networks Belgium and France

274. The three Belgian mobile operators are calling upon the Commsquare company to carry out tests along the road, to compare the quality of client experience with their networks. Among the quality indicators measured are the percentage of uninterrupted calls, the average download speed, the average transmission speed and the percentage of streaming videos that can be watched without interruption.

275. The graphs below illustrate the quality of client experience with the three Belgian operators, compared to that established in the French market, where there are four mobile operators[102].

276. On average, 98% of calls on the Belgian mobile networks are carried out without interruption, versus 97% in France. The levels of quality of speech on the Belgian and French mobile networks are therefore very comparable.

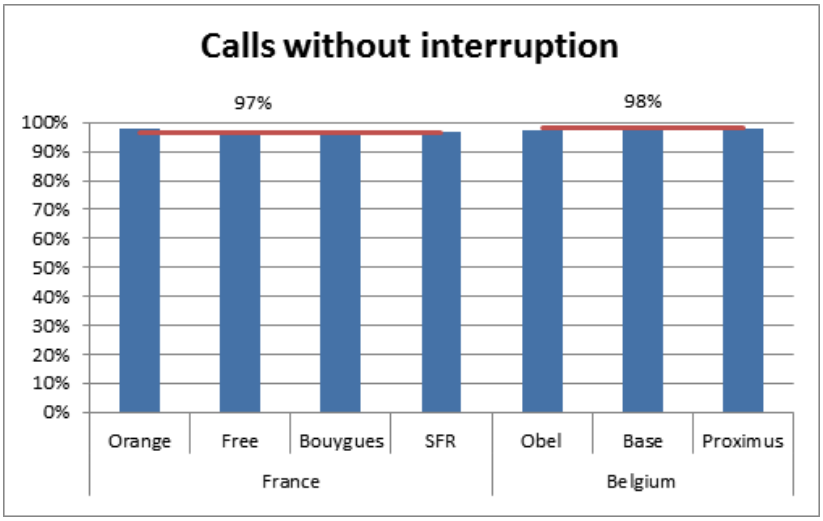

Figure 36: comparison of calls without interruption on Belgian and French networks (source: Commsquare, ARCEP)

277. The download speed on the Belgian mobile networks was 43 Mbps on average. This speed indicates good network quality, based on which speeds can be achieved

102 Given that the tests are being carried out by two different companies, a complete comparability of the indicators must be ruled out. Nevertheless, the definition of the indicators is the same for both countries. Source for Belgium: Commsquare, 2018. Source for France: Arcep, Les mesures de 4GMark, 2018.

that are very close to those offered over the fixed networks. In France, the average download speed over the four mobile networks is 21 Mbps. Moreover, the download speed over the Free network is 14 Mbps, reflecting a lower quality of client experience on that network.

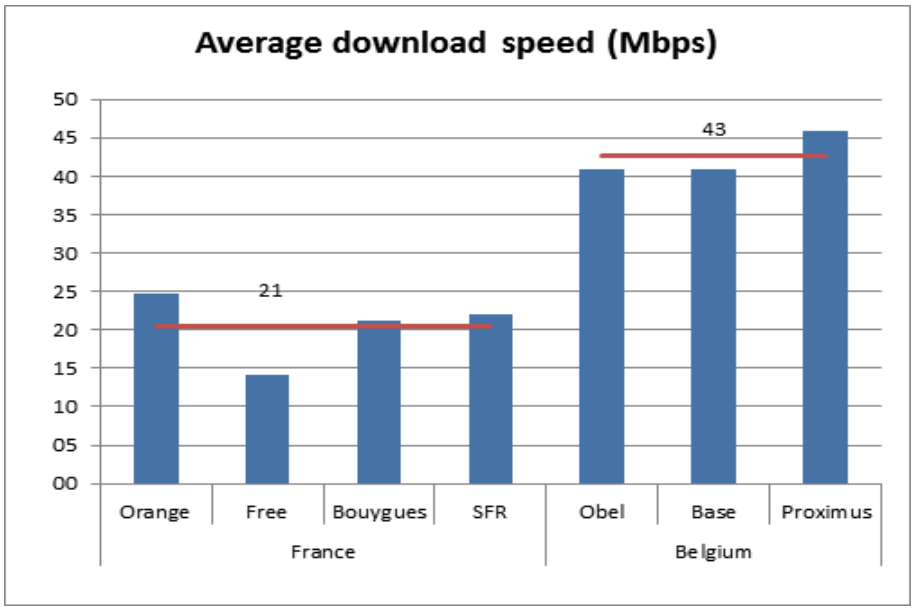

Figure 37: comparison of average download speeds in France/Belgium (source: Commsquare, ARCEP)

278. The average data transmission rate in the Belgian market is 17 Mbps, versus 7 Mbps in France.

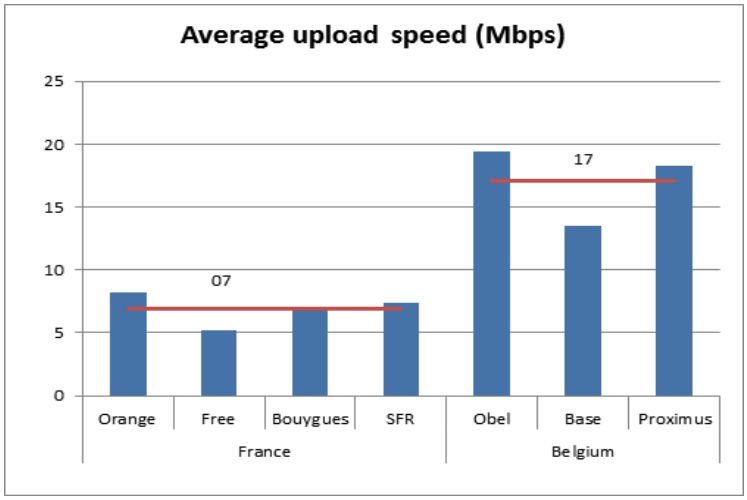

Figure 38: comparison of average transfer speed in France/Belgium (source: Commsquare, ARCEP)

279. Finally, it is estimated that 98% of the streaming videos currently being launched over the Belgian networks are uninterrupted. In France, that percentage is 81%, with the average being somewhat brought down by operator Free.

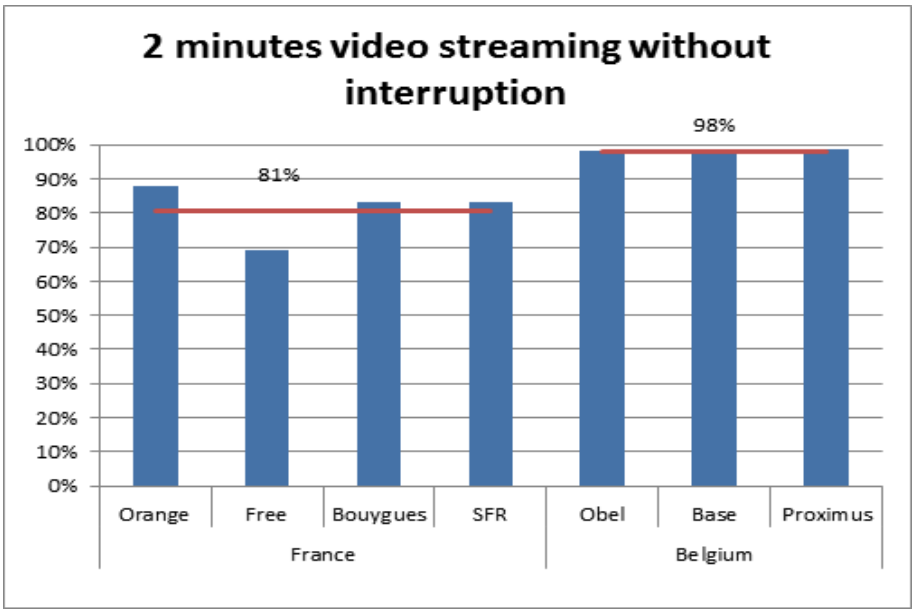

Figure 39: comparison uninterrupted video streaming in France/Belgium (source: Commsquare, ARCEP)

280. The studies on the quality of client experience in Belgium showed a high level of quality. Unlike France, the regulator in Belgium has not yet carried out these studies. Nevertheless, the three operators are calling upon the same company and the regulator will organise a measurement campaign along the road, aided by this company around September 2018. The results of these studies are considered credible.

281. Lastly, the European Commission's Digital Scoreboard also shows that the entry of Iliad has had a significant impact on the French mobile market, in particular a drop in the average mobile ARPU and a fall in market shares of the operator with the largest market share[103]:

103 Up till now, Free has achieved a market share of 18.5%.

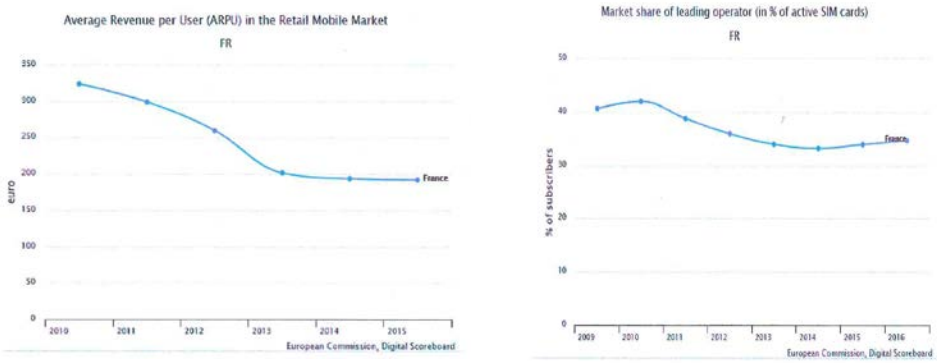

Figure 40: evolution of the ARPU and the market share of the largest operator in the French mobile market (source: European Commission)

Annex 6: OECD price comparison mobile telephony and Internet

282. The OECD also carried out an international benchmark price study concerning mobile telephony and Internet[104]. The tariff data was collected in May 2017. Discounts were taken into account and only the least expensive offer per country was considered. In this case, only the offers of the two largest network operators were considered. For Belgium, these consist solely of the tariff plans of Proximus and Orange, which makes the result less representative compared to the BIPT and EU studies. The figures below show the situation in Belgium compared to that of neighbouring countries. Prices are shown in USD. Belgium was ranked most expensive for all three profiles studied (low, medium and high). It should be noted that the three profiles contained an extremely heavy telephony component, bearing in mind that multiple minutes are charged per call (between 2 and 8 minutes, depending on the destination). The absolute amounts can therefore be higher per country than in other studies.

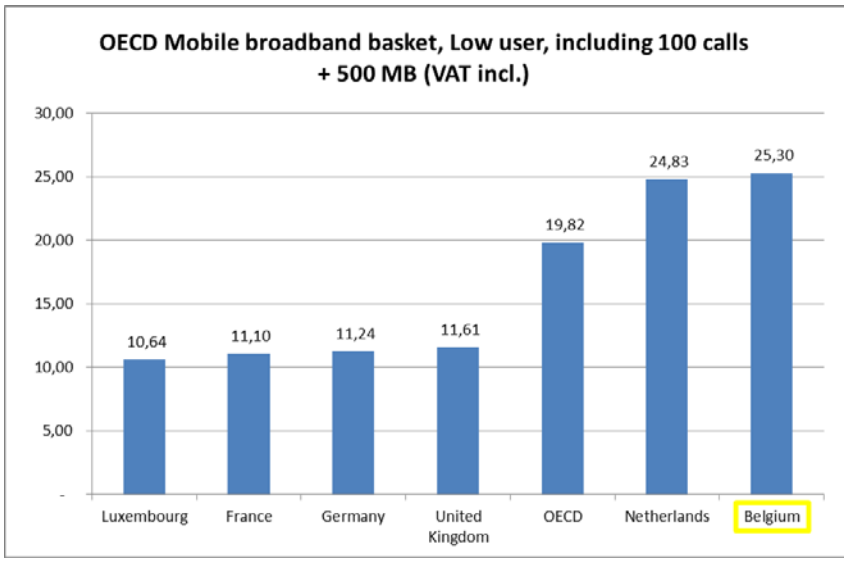

Figure 41: price comparison Belgium and neighbouring countries for a low usage profile (source: OECD)

104 OECD (Organisation for Economic Cooperation and Development), Mobile broadband basket http://www.OECD.org/sti/broadband/broadband-statistics/.

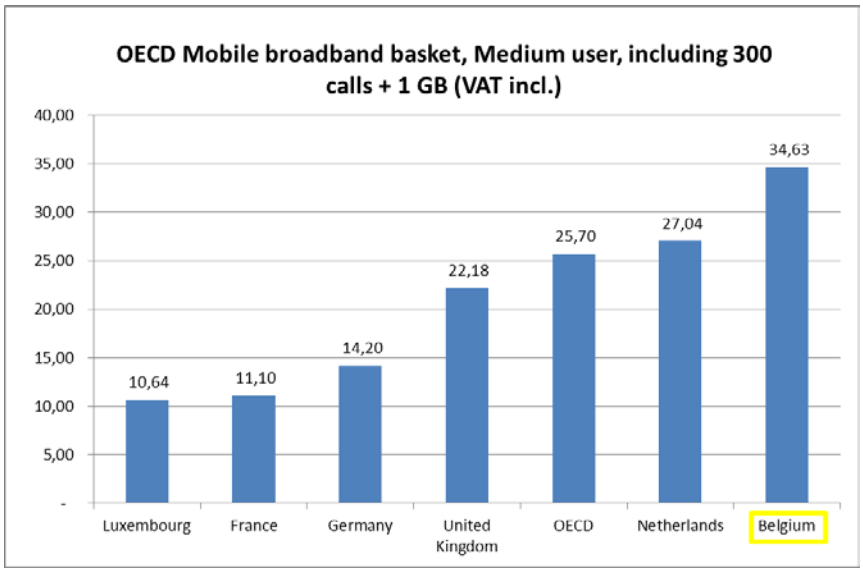

Figure 42: price comparison Belgium and neighbouring countries for a medium usage profile (source: OECD)

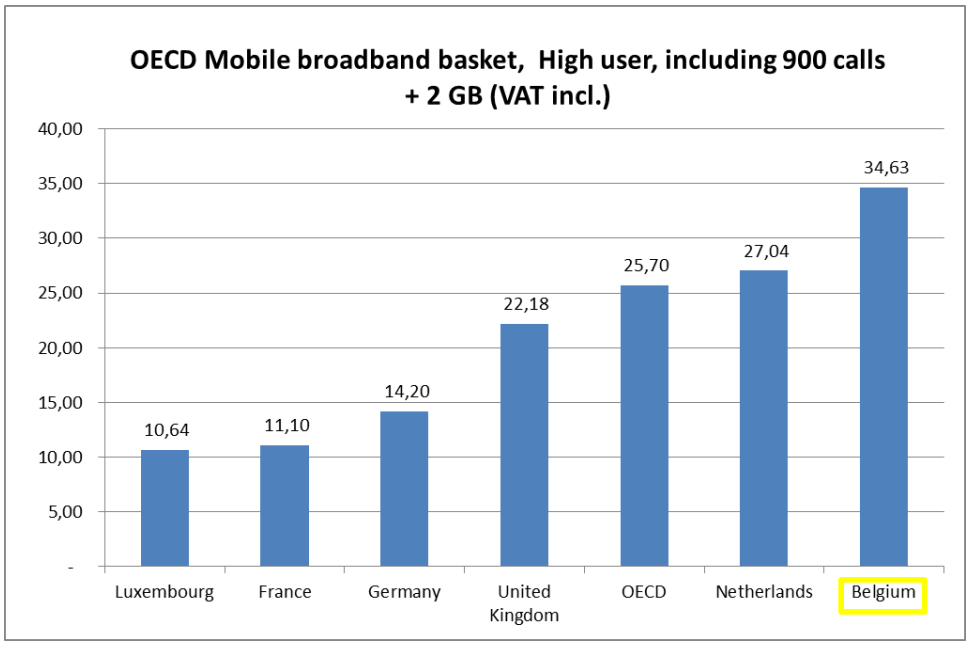

Figure 43: **price comparison Belgium and neighbouring countries for a high usage profile (source: OECD)**