

Decision

Approval of the methodology and ad hoc questionnaire for checking the coverage obligations imposed in the 2100 MHz band and amendment of the current annual questionnaire on coverage, quality of service and site-sharing.

BACKGROUND AND PRIOR HEARING

By decision of 9 March 2017 ANACOM approved the Draft Decision (DD) on the methodology and assumptions for the verification of additional coverage obligations in the 2100 MHz band of the 588 parishes potentially lacking mobile broadband. Additionally, the DD included an ad hoc questionnaire for MEO – Serviços de Comunicações e Multimédia, S.A. (hereinafter “MEO”) NOS Comunicações, S.A. (hereinafter “NOS”) and Vodafone Portugal - Comunicações Pessoais, S.A. (hereinafter “VODAFONE”) to provide information on the level of coverage ensured, based on the stations operating in the 2100 MHz band, on the date of renewal of the relevant rights of use of frequencies (21 April 2018, 4 June 2018, and 5 May 2018, respectively), which is when the additional coverage obligations will enter into force. Also approved was the amendment of the current annual questionnaire on coverage, quality of service and site-sharing.

The DD was submitted to a prior hearing of stakeholders, MEO, NOS, and VODAFONE, pursuant to Articles 121 ff. of the Código do Procedimento Administrativo (Code of Administrative Procedure), with stakeholders given a period of 20 working days to comment on its content, in writing, as they saw fit.

Following the requests presented by NOS and VODAFONE, on 4 April 2017 ANACOM decided to extend the deadline of the mentioned hearing by five working days, which thus ended on 17 April 2017.

Comments from MEO, NOS, and VODAFONE were received before the deadline of the prior hearing expired.

This was the context in which the report of the prior hearing was prepared, which is an integral part of this decision. It includes a summary of the positions presented by the stakeholders as well as ANACOM's understanding of them, which support this decision and, in particular, the modifications that it was deemed appropriate to introduce in light of what was in the DD.

1. CONTEXT

By determination of 18 February 2016¹, ANACOM approved the renewal for a period of 15 years of the rights of use of frequencies (RUF) allocated in the 2100 MHz band (1920-1980 MHz/2110-2170 MHz sub-band) to NOS, MEO and VODAFONE, under the terms laid down in endorsements to titles ICP-ANACOM 01/2012, ICP-ANACOM 02/2012 and ICP-ANACOM 03/2012 in Annex 1 of the mentioned decision and deemed to be an integral part thereof.

1.1. In this decision ANACOM deemed it appropriate and proportional to determine the imposition of additional coverage obligations on NOS, MEO and VODAFONE in the 2100 MHz band, with each company being required to ensure the coverage of 196 of the parishes potentially lacking mobile broadband (MBB) coverage, listed in Annex 2, having decided, however, that *“the methodology establishing how compliance with these obligations by mobile operators is checked will be approved in a separate determination of this Authority”*.

In this respect, ANACOM also mentioned in the report of the consultation on the draft decision on the *“renewal of the rights of use of frequency assigned in the 2100 MHz band for terrestrial electronic communications services”*², that *“(…) it would be preferable to frame such definition [of the mentioned methodology] within the necessary process of review of the current annual questionnaire, which includes the original obligations regarding the 2100 MHz band, approved by ANACOM on 13 November 2014³, in particular the questionnaire about coverage (regarding voice and data services up to 9600 bps, data services with transmission rates of 144 kbps, and data services with transmission rates of 384 kbps), quality of service, and how to implement the site-sharing policy”*.

It should be noted that these additional coverage obligations will only come into effect on the date of the renewal of the RUF, which will be in mid-2018 (4 June 2018, 21 April 2018, and 5 May 2018, respectively, for NOS, MEO and VODAFONE). The obligations should be totally

¹ Renewal of the rights of use of frequencies assigned in the 2100 MHz band for terrestrial electronic communications services, available at <https://www.anacom.pt/render.jsp?categoryId=385088>.

² Available at <https://www.anacom.pt/render.jsp?categoryId=385074>.

³ Vide <https://www.anacom.pt/render.jsp?contentId=1339740#.V9p7PflVsYg>

met within a year of those dates.

1.2. In the context of the aforementioned decision, ANACOM further held that minimum coverage levels not lower than those existing at the time of the renewal of the RUF assigned to NOS, MEO and VODAFONE in the 2100 MHz band will continue to be ensured, taking as a reference basis for that purpose the entire population covered by a municipality, as will the coverage of data services for the maximum speed secured by these operators, in that same frequency band, provided in the respective municipality. The above-mentioned speeds (rates) must correspond to the theoretical upper rate that is possible for a user in an external environment, including signalling/codification traffic.

For this purpose, the same decision also provided that NOS, MEO and VODAFONE are required:

- within 60 working days from the date of renewal of their RUF, to submit to ANACOM the response to the ad hoc questionnaire, which should be approved for this purpose in a separate determination of this Authority, and which is now the subject of the present decision;
- in each year, to present to ANACOM a declaration confirming that, on 31 December of the preceding year the levels of population coverage reported in the respective responses to the mentioned ad hoc questionnaire have been guaranteed.

Thus, as decided on 18 February 2016, the methodology for verifying the coverage obligations at stake should be established, the previously mentioned ad hoc questionnaire should be approved, and the annual questionnaire approved by ANACOM's decision of 13 November 2014³ should be amended.

2. METHODOLOGY FOR VERIFYING COVERAGE OBLIGATIONS

2.1. CURRENT METHODOLOGY

By decision of 19 March 2008⁴, ANACOM approved the methodology to evaluate mobile operators' UMTS (Universal Mobile Telecommunications System) coverage, which remains in effect, with some adaptations, especially with respect to technological neutrality.

⁴ Vide <https://www.anacom.pt/render.jsp?contentId=1381256#.V6OlphLVt4k>

In short, this methodology includes:

- requesting information from mobile operators on the coverage achieved annually, as well as detailed information supporting those coverage values, in particular, theoretical studies of coverage, including the detailed assumptions used in planning;
- based on this information, and if necessary, ANACOM conducts coverage studies to measure the coverage reported by operators to this Authority, calculated in accordance with the calculation methods used by operators;
- If necessary, ANACOM undertakes measurements in the field, selecting sampling points in order to check the coverage values reported by operators to ensure greater practical consistency in the process.

In retrospect, we recall that in 2008 mobile operators only operated the GSM (Global System for Mobile Communications) system in the 900 MHz and 1800 MHz bands, and the UMTS system in the 2100 MHz band. Therefore, the evaluation of the UMTS coverage was supported by specific aspects of the UMTS network planning, such as the pilot tone strength and the load cell factor⁵.

In the context of radio spectrum refarming in the 900 MHz and 1800 MHz frequency bands, ICP-ANACOM decided, by decision of 8 July 2010⁶, to unify in a single title the conditions governing the exercise of the rights of use of frequencies granted to mobile operators to provide the land mobile service (GSM and UMTS). This would let spectrum management become more efficient, particularly in relation to compliance with coverage obligations, and the setting of obligations including the requirement to send ANACOM information, particularly annual information on the coverage achieved by operator in the context of the provision of voice and data services up to 9600 bps and data services with transmission rates of 144 kbps and 384 kbps, for the purpose of verifying compliance with the relevant coverage obligations, as well as monitoring their progress.

Subsequently, ANACOM considered that the annual information on coverage, quality of service and how to implement site-sharing to be sent to this Authority by each mobile operator, and the information on coverage under the provision of voice and data services up to 9600

⁵ Although mobile operators are linked to radio licensing, that type of information on network planning assumptions, is not required in this context.

⁶ *Vide* <https://www.anacom.pt/render.jsp?contentId=1036521#.V9p5KPLVsYg>

bps, achieved by VODAFONE and MEO by the time of the issuance of the unified titles, as well as the information on the assumptions used in the respective calculation, should be systematized and complemented by an annual questionnaire and an ad hoc questionnaire, respectively. These questionnaires were approved by a decision of 17 December 2011⁷, which also established the obligation for VODAFONE and MEO to submit a declaration each year confirming the maintenance, for voice and data services up to 9600 bps, of levels of full population coverage, per locality with over 10 000 inhabitants and per municipality, at least the same as those confirmed at the time of the issuance of the respective unified titles (8 July 2010)⁸.

In the case of NOS, the above-mentioned obligations of responding to the ad hoc questionnaire and sending the annual declaration were only imposed later, in the context of the renewal process of the rights of use of frequency assigned to this company in the 900 MHz and 1800 MHz frequency bands (vide decision of 17.05.2012⁹)

By determination of 9 March 2012¹⁰ and following the allocation to NOS, MEO and VODAFONE of rights of use of frequencies in the scope of the Multiband Auction¹¹, it became necessary to update the annual questionnaire approved on 17 November 2011, since it did not enable the complete monitoring of the coverage obligations in connection with the rights of use of frequencies, notably because it only included the coverage reached by using rights of use of frequencies for the provision of the Land Mobile Service according to the GSM and UMTS systems (excluding technologies such as LTE, for example). This way, by a determination of 13 November 2014¹², ANACOM approved the current version of the questionnaire on coverage, quality of service and how to implement the site-sharing policy, to be sent by mobile operators to his Authority.

2.2. METHODOLOGY FOR VERIFICATION OF THE COVERAGE OBLIGATIONS IN THE 588 PARISHES POTENTIALLY LACKING MBB

⁷ Vide <https://www.anacom.pt/render.jsp?contentId=1105253#.V63nhBLVt4k>

⁸ Note that the ad hoc questionnaire and the subsequent annual declarations are only submitted by VODAFONE and MEO – although NOS also had its title unified – since those obligations were instrumental to verifying the coverage obligations arising from the renewal of the respective GSM 900/1800 MHz RUF in 2006.

⁹ Vide <https://www.anacom.pt/render.jsp?contentId=1127450#.WDm72rnFow0>

¹⁰ Vide <https://www.anacom.pt/render.jsp?contentId=1120054#.V9lu1vLVsYg>

¹¹ Auction for the assignment of rights of use of frequencies in the 450 MHz, 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz and 2.6 GHz

¹² Vide <https://www.anacom.pt/render.jsp?contentId=1339740#.V9p7PflVsY>

In the determination of 18 February 2016, on paragraph 4.2.3 *“Implementation of the coverage obligation in the 588 parishes as tend to lack MBB coverage”* ANACOM indicated that *“The methodology establishing how compliance with these obligations by mobile operators is checked shall be approved in a separate determination of this Authority”*.

Considering that the present methodology, explained in the previous point, remains up to date, ANACOM deems it should also be applied in the verification of the coverage obligations in the 588 parishes tending to lack MBB coverage, and therefore, for the purpose of and as has occurred, this Authority understands it should:

- request information from mobile operators on the coverage achieved annually, as well as detailed information supporting those coverage values, in particular, theoretical studies of coverage, including the detailed assumptions used in planning;
- based on this information, and if necessary, conduct coverage studies (in accordance with the calculation methods used by operators), which results will enable the assessment the coverage reported by operators;
- if necessary, take measurements in the field, selecting sampling points in order to check the coverage values reported by operators to ensure greater practical consistency in the process.

However, considering that the setting of additional coverage obligations in the 2100 MHz band naturally entails a reassessment of the planning assumptions used, it is important to stress that (besides the technical data that mobile operators have been sending to support the coverages reported, notably for voice and data services up to 9600 bps, data services with transmission rates at 144 kbps, and data services with transmission rates at 384 kbps) it becomes necessary to obtain additional elements that make it possible to verify the availability of MBB in the 588 parishes included in the list annex to the determination of 18 February 2016. In fact, the complexity inherent to the verification of the mobile operators' coverage obligations has increased considerably, since they can make use of several frequency bands to meet their coverage obligations and to operate on a basis of technological neutrality, without being required to implement a specific technology.

In this sense, the current annual questionnaire is adapted (see section 4), by including, in the respective Part B, additional elements, such as the identification of the base stations that provide data services, including the type of antennas used and the corresponding radiation

diagrams, as well as the associated technology and bandwidth used, which are necessary elements for ANACOM to validate the information sent by mobile operators.

As from the date of the renewal of the RUF, this questionnaire is also applicable to the coverage obligations that are included in the RUF of mobile operators, except the coverage obligations in the 800 MHz frequency band provided for in Regulation 560-A/2011 of 19 October, and in paragraph 18 of titles ICP-ANACOM 01/2012 and 02/2012, as well as in paragraph 19 of title ICP-ANACOM 03/2012, whose methodology and corresponding report are defined in ANACOM's decision of 21 March 2014¹³.

3. AD HOC QUESTIONNAIRE

As explained above, NOS, MEO and VODAFONE are required, in the provision of data services in the 2100 MHz band, to ensure a minimum coverage not lower than that confirmed, respectively, on 4 June 2018, 21 April 2018, and 5 May 2018, while the coverage level ensured will be assessed based on the information sent by the companies within the ad hoc questionnaire, to be approved by this Authority.

For this, ANACOM developed an ad hoc questionnaire for NOS, MEO and VODAFONE to report information on the coverage level ensured in the 2100 MHz band at the date of the renewal of their RUF, under the terms stated in **Annex 1** to this determination, of which it is an integral part.

4. AMENDMENT OF THE ANNUAL QUESTIONNAIRE ON COVERAGE, QUALITY OF SERVICE, AND SITE-SHARING

As previously mentioned, the determination of 18 February 2016 imposed additional coverage obligations in the 2100 MHz band on NOS, MEO and VODAFONE. Each company was required to ensure the coverage of 196 parishes potentially lacking BBM. Additionally, the companies must ensure minimum coverage levels to users that is not lower than those existing on the date of the renewal of the RUF assigned in the 2100 MHz band, i.e., on 4 June 2018, 21 April 2018, and 5 May 2018.

Therefore, the annual questionnaire approved by decision of 13 November 2014 is reviewed,

¹³ Available at <https://www.anacom.pt/render.jsp?contentId=1194253>.

as arises from paragraph 2.2 and the terms set out in Annex 2 of this decision, and explained next.

In Part A of the questionnaire, besides changes in the information to be reported by operators to ANACOM to check the compliance with the coverage obligations, some modifications have been made to the information that the current questionnaire specifically requires, so as to enable this Authority to monitor the progress of the coverages checked. Given the evolution of the market, ANACOM understands that the reference transmission rates of the current questionnaire should also be modified regarding this last piece of information.

Essentially, these are the changes introduced into the questionnaire:

- The information sent to ANACOM should be reported by the end of the 30th consecutive day of the month after the end of each calendar year, instead of the 20th day which corresponds to the deadline set for the report, still in effect.
- In the context of the information report on coverage, recorded at national level and by NUTS II, regarding data services, the 144 kbps and 384 kbps transmission rates currently specified in the questionnaire in effect are replaced by 30 Mbps and by “maximum speed provided” in each of the geographical areas in question.

ANACOM considers it essential to monitor the implementation of these coverages, since these elements make it possible to monitor the progress in the availability of services and their transmission rates, as well as to assess compliance with the objective set in the Digital Agenda for Europe, to be reached in 2020, and also having in mind the latest objective set by the European Commission for 2025.

- Inclusion of a table for reporting information on coverage of the data services in the 196 parishes potentially lacking MBB that must be covered by each operator, with distribution carried out according to the terms and conditions set out in ANACOM’s determination of 18 February 2016 and approved by determination of 2 March 2017¹⁴.
- In the context of reporting information on the coverage of major roads regarding the data service, the 144 kbps and 384 kbps transmission rates currently specified in the questionnaire in force are replaced by 30 Mbps and by the “maximum speed provided”

¹⁴ Available at <https://www.anacom.pt/render.jsp?contentId=1405831>

for each major road, bearing in mind the verification of the objective defined the Digital Agenda for Europe, to be reached in 2020, and also having in mind the most recent objective defined by the European Commission for 2025.

- Inclusion of a table for reporting information on coverage relating to data services nationwide and by municipality for the provision of terrestrial electronic communications services – in order to check the fulfilment of the obligation each year, as established in ANACOM's determination of 18 February 2016, to maintain the minimum coverage levels as on the date of the renewal of the RUF assigned to NOS, MEO and VODAFONE in the 1920-1980 MHz / 2110-2170 MHz sub-band.
- Amendment of Part B of the questionnaire, aiming in particular at and in addition to the elements already requested, to obtain information on the location of the base stations that provide the data services, including the type of antennas used and the respective radiation diagrams, as well as the associated technology and the respective bandwidth.

5. DECISION

Therefore, **ANACOM's Board of Directors**, following its determination of 18 February 2016, under Article 27(1)(t), pursuant to Article 108, and for the purposes provided for in Article 109(1)(c), all contained in the Electronic Communications Law, in the wording currently in force, in the exercise of the powers granted to it by Article 9(1)(h)and(m) and under the provisions of Article 26(1)(q) of its Statutes, approved by Decree-Law 39/2015 of 16 March, **determines the following:**

1. To approve the methodology and assumptions for verification of the additional obligations for coverage of the 588 parishes potentially lacking mobile broadband, under the terms in paragraph 2.2 of the present decision.
2. To approve the ad hoc questionnaire set out in **Annex 1** to this decision, of which it is an integral part.
3. To approve the amendment to the annual questionnaire on coverage, quality of service and how to implement the site-sharing policy under the terms stated in **Annex 2** to this decision, of which it is an integral part. That this questionnaire will be sent by ANACOM to NOS, MEO and VODAFONE from 2019, while the deadlines for sending and the

dates to which the different information relates are specified in the questionnaire itself.

4. That the annual questionnaire on coverage, quality of service and how to implement the site-sharing policy approved by decision of 13 November 2014 will remain in force until 20 January 2018.

Lisbon, 15 September 2017

ANNEX 1 – AD HOC QUESTIONNAIRE

AD HOC QUESTIONNAIRE

INFORMATION ON COVERAGE REGARDING THE DATA SERVICE PROVIDED IN THE 1920-1980 MHz / 2110-2170 MHz SUB-BAND

MEO - Serviços de Comunicações e Multimédia, S.A. (MEO), NOS, Comunicações, S.A. (NOS) and VODAFONE PORTUGAL - Comunicações Pessoais, S.A. (VODAFONE), are required under article 32(1)(a) of the Electronic Communications Law and the respective Rights of Use of Frequencies (RUF) for terrestrial electronic communications, to ensure, in the provision of data services in the 1920-1980 MHz / 2110-2170 MHz sub-band, a minimum coverage at municipality level, *both in terms of population and of geographical distribution*, not lower than that confirmed on the dates of the renewal of the RUF, on 21 April 2018, 4 June 2018 and 5 May 2018, respectively.

For that purpose and under the terms mentioned in the RUF, the reference basis for the coverage level ensured is considered to be the information sent to ANACOM by MEO, NOS, and VODAFONE in the context of the present questionnaire, approved by this Authority on 2017.

Therefore, pursuant to Article 27(1)(t), under the terms of Article 108, and for the purposes provided for in Article 109(1)(c), all contained in Law 5/2004 of 10 February, in the wording currently in force, MEO, NOS and VODAFONE are required to send ANACOM the present questionnaire, duly completed, within 60 working days from the date of renewal of the respective RUF.

The questionnaire consists of two parts:

- Part A: Information on coverage related to the provision of data services using the 1920-1980 MHz / 2110-2170 MHz sub-band;
- Part B: Elements to be presented in support of the coverage results, regarding the provision of data services using the 1920-1980 MHz / 2110-2170 MHz sub-band, reported in Part A of the questionnaire.

Identification of the responding company: _____

Company contact point:

Name: _____

Telephone contacts: _____

Fax: _____

email: _____

PART A

Information on coverage relating to data services using the 1920-1980 MHz / 2110-2170MHz sub-band, confirmed on the date of the renewal of the corresponding Rights of Use of Frequencies for the provision of terrestrial electronic communications services.

INDICATOR 1 – DATA SERVICE - TOTAL POPULATION COVERED ON 2018

(date to be filled by the responding company)

Maximum download speed in Mbps, at national level	TOTAL NATIONAL POPULATION (thousands of inhabitants)¹	TOTAL POPULATION COVERED (%)²	Indication of the technology(ies) considered for assessing the population at <u>national level</u> using the 1920-1980 MHz / 2110-2170 MHz sub-band

¹ The latest Census published by Instituto Nacional de Estatística (Statistics Portugal) at the time that the information relates to should be taken as a reference.

² This indicator refers to the ensured population coverage at national level in the 1920-1980 MHz/2110-2170 MHz sub-band relative to the data service for the maximum speed provided (maximum download speed) at national level. The speed (rate) should correspond to the theoretical upper rate that is possible for a user in an external environment, including signalling/codification traffic, regardless of the user's distance from the base station, i.e., it is intended that every user can benefit from this facility in the area in question.

INDICATOR 2 – DATA SERVICE – TOTAL POPULATION COVERED ON 2018

(date to be entered by the responding company)

LIST OF MUNICIPALITIES	Maximum download speed in Mbps per municipality	POPULATION PER MUNICIPALITY (in thousands of inhabitants)¹	POPULATION COVERED PER MUNICIPALITY (%)³	Indication of the technology(ies) considered for calculating the population coverage in each municipality using the 1920-1980 MHz / 2110-2170 MHz sub-band
Municipality A				
Municipality B				
Municipality C				
...				

³ This indicator refers to the ensured population coverage by municipality in the 1920-1980 MHz/2110-2170 MHz sub-band relative to the data service for a maximum speed provided (maximum download speed) in the respective municipality. The speeds (rates) should correspond to the theoretical upper rate that is possible for a user in an external environment, including signalling/codification traffic, regardless of the user's distance from the base station, i.e., it is intended that every user can benefit from this facility in the area at stake.

PART B

Elements to be presented in support of the coverage results reported in Part A of this questionnaire:

In addition to the response to Part A of the questionnaire, the responding company should send ANACOM a description of the coverage(s) in outdoor spaces based on the reception at 1.5 m above the ground, on maps of an appropriate scale (at least 1:1 500 000). The assumptions and methodology used for the calculation of the coverages reported should be indicated, and the following elements should be indicated, per reported speed:

- maps used in the calculations, including population maps;
- propagation model(s);
- measurements taken for the calibration of the propagation models used;
- location of the base stations that provide the service, including the type of antennas used and their radiation diagrams, as well as the associated technology and bandwidth;
- calculation of the link budget(s), including parameters per reported speed, such as the sensitivity value, SINR, Eb/No, type of modulation, etc.

ANNEX 2 – REVISION OF THE CURRENT QUESTIONNAIRE

ANNUAL QUESTIONNAIRE

INFORMATION ON COVERAGE, QUALITY OF SERVICE AND HOW TO IMPLEMENT THE SITE-SHARING POLICY IN THE SCOPE OF THE RIGHTS OF USE OF FREQUENCIES FOR TERRESTRIAL ELECTRONIC COMMUNICATIONS SERVICES

Under the terms established on the Rights of Use of Frequencies for terrestrial electronic communications services, MEO - Serviços de Comunicações e Multimédia, S.A. (MEO), NOS, Comunicações, S.A. (NOS), and VODAFONE PORTUGAL - Comunicações Pessoais, S.A. (VODAFONE) are required to send ANACOM, specifically, information on (i) the coverage achieved using the corresponding rights of use of frequency, (ii) the parameters of quality of service and network performance, and (iii) how the site-sharing policy is implemented, with the content, format and frequency established by this Authority on 2017.

Therefore, pursuant to Article 27(1)(t), under the terms of Article 108 and for the purposes provided for in Article 109(1)(c), all contained in Law 5/2004 of 10 February, in the wording currently in force, MEO, NOS and VODAFONE are required to send ANACOM the present questionnaire, duly completed and by the deadlines stipulated below.

The questionnaire is made up of two parts:

- Part A: Annual information on coverage (voice and data services up to 9600 bps; data services at 30 Mbps; data services for the maximum speed available per geographical area (national, NUTS II, and municipalities); data services in the 196 parishes potentially lacking mobile broadband coverage (whose distribution was carried out under the terms and conditions set out in ANACOM's decision of 18 February 2016, available at

<https://www.anacom.pt/render.jsp?contentId=1379330>, and approved by decision of 2 March 2017, available at <https://www.anacom.pt/render.jsp?contentId=1405831>), quality of service, and how to implement the site-sharing policy.

- Part B: Elements to be presented in support of the coverage results reported in Part A of the questionnaire and which relate to the various services in the context of which the coverage obligations were established.

Note: This annual questionnaire does not extend to the information on meeting the coverage obligations in the 800 MHz frequency band provided for in Regulation 560-A/2011 of 19 October, and in paragraph 18 of titles ICP-ANACOM 01/2012 and 02/2012, as well as in paragraph 19 of title ICP-ANACOM 03/2012, which should be reported under the questionnaire included in Annex 3 of ANACOM's decision of 21 March 2014 (available at <https://www.anacom.pt/render.jsp?contentId=1194253>).

Deadlines for sending information to ANACOM:

- a) The information on the coverage of voice and data services up to 9600 bps, of data services at 30 Mbps, and of data services for the maximum speed provided per geographical area (national, NUTS II, and municipalities), quality of service, and the implementation the site-sharing policy, should be sent to ANACOM by the 30th consecutive day of the month after the end of each calendar year¹ and relate to the end of that calendar year, while the first report should be made by 30 January 2019 with reference to 31 December 2018;

¹ The deadline for sending this information coincides with that for sending the declarations to ANACOM under the terms of ANACOM Decisions of 13 November 2014 (Vide <https://www.anacom.pt/render.jsp?contentId=1339740#.V9p7PflVsYg>) and 18 February (Vide <https://www.anacom.pt/render.jsp?categoryId=385088>).

b) The information on the coverage of data services in the 196 parishes potentially lacking mobile broadband coverage, whose distribution was carried out under the terms and conditions set out in ANACOM's decision of 18 February 2016 and approved by the decision of 2 March 2017, should be sent to ANACOM by the 30th consecutive day of the month after the end of each calendar year and relate to the end of that calendar year, except in the case of the first report, which should be referenced to 21 April 2019, for MEO, 4 June 2019, for NOS, and 5 May 2019 for VODAFONE, and sent to ANACOM by the 20th consecutive day after those dates.

Identifications of the responding company: _____

Company contact point:

Name: _____

Telephone contacts: _____

Fax: _____

E-mail: _____

PART A

Annual information on coverage (voice and data services up to 9600 bps; data service at 30 Mbps; data services for the maximum speed provided per geographical area (national, NUTS II, and municipalities); data service in the 196 parishes potentially lacking mobile broadband coverage, quality of service, and how to implement the site-sharing policy.

A.1. Annual information on coverage regarding voice and data services up to 9600 bps, data service at 30 Mbps, data services for the maximum speed available per geographical area (national, NUTS II, and municipalities) and for the data services in the 196 parishes potentially lacking mobile broadband coverage (whose distribution was carried out under the terms and conditions set out in ANACOM's decision of 18 February 2016 and approved by ANACOM's decision of 2 March 2017).

A.1.1. Coverage checked at national level and for NUTS II for voice and data services up to 9600 bps, the data service at 30 Mbps, and data services for the maximum speed available.

- Date to which the information in this table relates: **31 December** (enter the year)

		PORTUGAL (national total)	NUTS II ²						Indication of the technology(ies) /band(s) considered for the calculating the population coverage at national level and in <u>each NUTS II</u>
			NORTH	CENTRE	GREATER LISBON AREA	ALENTEJO	ALGARVE	AUTONOMOUS REGION OF THE AZORES	
POPULATION (thousands of inhabitants) ³									
AREA (in km ²)									
VOICE AND DATA SERVICES UP TO 9600 bps	% POPULATION COVERED ⁴								
	% AREA COVERED ⁵								
DATA SERVICES AT 30 Mbps ⁶	% POPULATION COVERED ³								
	% AREA COVERED ⁴								
DATA SERVICES (maximum download speed in Mbps) ⁷	% POPULATION COVERED ³								
	% AREA COVERED ⁴								
	Speed provided (in Mbps)								

² Definition of NUTS (nomenclature of territorial units for statistics): Common statistical nomenclature of territorial units to enable the collection, compilation and dissemination of harmonised regional statistics in the European Community. The NUTS classification divides the economic territory of Member-States into territorial units and assigns each territorial unit a specific designation and code. The NUTS classification is a hierarchical one. It divides each Member State into territorial units at the level of NUTS I, each of which is divided into territorial units at the level of NUTS II, which are then divided into territorial units at the level of NUTS III. Following the approval of Law 75/2013 of 12 September (which approved the statute of intermunicipal entities), the Portuguese State asked the European Commission to process an extraordinary revision of Portuguese NUTS regions. The new NUTS III changed from 30 to 25 territorial units. In the case of Portuguese NUTS II there were no changes except for the designation of NUTS II Lisboa to NUTS II Área Metropolitana de Lisboa. Sources: Regulation (EC) 1059/2003 of the European Parliament and the Council, of 26-05-2003, published in the OJEU L 154 of 21-06-2003; DL 244/2002 of 5-11; DL 244/2002 of 5-11 with the amendments resulting from the extraordinary revision process of Portuguese NUTS, following the approval of Law 61/2012 of 5 December, of Laws 56/2012 of 8 November and 11-A/2013 of 28 January, and Law 75/2013 of 12 September, INE).

³ The latest Census published by Instituto Nacional de Estatística (Statistics Portugal) at the time that the information relates to should be taken as a reference.

⁴ This indicator concerns the population covered (considering coverage in outdoor areas), at national level and in each NUTS II region, in thousands of inhabitants, relating, respectively, to the total national population and the population residing in each of those regions.

⁵ This indicator corresponds to the total area covered in km² (considering coverage in outdoor areas), at national level and in each NUTS II, relating, respectively, to the total area of the national territory and of each NUTS II.

⁶ Taking as a reference basis for the ensured coverage at 30 Mbps data transmission rate (maximum download speed) in the geographical area where the coverage is calculated. Note that this speed corresponds to the theoretical upper rate that is possible for a user in an external environment, including signalling/codification traffic, regardless of the user's distance from the base station, i.e., it is intended that every user can benefit from this facility in the area in question.

⁷ Taking as a reference basis for the ensured coverage at the maximum speed available in the geographical area where the coverage is assessed (maximum download speed). Speed(rates) should correspond to the theoretical upper rate that is possible for a user in an external environment, including signalling/codification traffic, regardless of the user's distance from the base station, i.e., it is intended that every user can benefit from this facility in the area in question.

A.1.2. Coverage relative to data services in the 196 parishes potentially lacking mobile broadband coverage

- Date to which the information included in the present table relates: (enter day, month, year)

LIST OF PARISHES	POPULATION PER PARISH (in thousands of inhabitants) ²	POPULATION COVERED PER PARISH (in %) ⁸	Indication of the technology(ies) /band(s) considered for the calculation of the population coverage in each parish
Parish X			
Parish Y			
[...]			
Parish 196			

A.1.3. Information on the coverage of major roads

- Date to which the information included in the present tables relates: **31 December** (enter the year)

⁸ This indicator corresponds, for each parish, to the population covered (considering outdoor areas coverage), in thousands of inhabitants, versus the total population of that parish. The 196 parishes are held to be covered whenever 75% of the population in each of those parishes has access to an MBB service that enables a transmission rate of 30 Mbps (maximum download speed). Note that this speed corresponds to the theoretical upper rate that is possible for a user in an external environment, including signalling/codification traffic, regardless of the user's distance from the base station, i.e., it is intended that every user can benefit from this facility in the area in question.

A.1.3.1. Voice and data services up to 9600 bps – major road coverage

MAJOR ROADS COVERED	LENGTH OF ROAD (in km)	% WITH COVERAGE ⁹	Indication of the technology(ies) /band(s) considered for the calculation of the coverage (in km) <u>on each road</u>
Road A			
Road B			
Road C			
.....			

A.1.3.2. Data services at 30 Mbps⁵ – major road coverage

MAJOR ROADS COVERED	LENGTH OF ROADS (in km)	% WITH COVERAGE ⁸	Indication of the technology(ies) /band(s) relevant for the calculation of the coverage (in km) <u>on each road</u>
Road A			
Road B			
Road C			
.....			

A.1.3.3. Data services – major road coverage (calculated with reference to the maximum download speed⁶ provided on each road)

MAJOR ROADS COVERED	LENGTH OF ROADS (in km)	% WITH COVERAGE ⁸	Indication of the technology(ies) / band(s) relevant for the calculation of the coverage (in km) <u>on each road</u>	Maximum download speed (in Mbps)
Road A				
Road B				
Road C				
.....				

⁹ This indicator corresponds, for each major road, to the km covered (considering coverage in outdoor spaces), versus the total length of the major road.

A.1.4. Information on coverage relative to data services, nationally and per municipality, for the provision of terrestrial electronic communication services (calculated taking as reference the maximum download speed reported by the responding company in the ad hoc questionnaire)

- Date to which the information included in this table relates: **31 December** (enter the year)

GEOGRAPHICAL AREA	Maximum download speed in Mbps (per municipality) ¹⁰	POPULATION PER MUNICIPALITY (thousands of inhabitants) ¹	POPULATION COVERED PER MUNICIPALITY (%) ¹¹	Indication of the technology(ies) /band(s) considered for calculating the population coverage in each municipality
PORTUGAL (national total)				
Municipality A				
Municipality B				
Municipality C				
...				

A.2. Information on quality of service

¹⁰ Maximum download speed reported to ANACOM under the ad hoc questionnaire, approved by this Authority on 15 September 2017.

¹¹ This indicator corresponds, at national level and for each municipality, to the population covered (considering outdoor areas coverage), in thousands of inhabitants, versus, respectively, the national total and municipal total population. The speeds (rates) should correspond to the theoretical upper rate that is possible for the download speed indicated in the first column of the table, for a user in an external environment, including signalling/codification traffic, regardless of the user's distance from the base station, i.e., it is intended that every user can benefit from this facility in the area in question.

The following table should contain the details that make it possible to efficiently assess the parameters of quality of service and network performance. The fields that do not apply to your company should be completed with "n.a.":

- Date to which the information included in the present table relates: **31 December** (enter the year)

QUALITY OD SERVICE INDICATORS	GSM	UMTS	Other systems	Observations
Service set-up time				
Level of service availability				
Rate of mobile network lock-out at peak periods				
Lock-out rate of interconnections between the MTS and other services				
Level of network availability				
Delay time				
Error Rate				
Transmission Rates				

A.3. Information on the implementation of the site-sharing policy

- Date to which the information included in the present table relates: **31 December** (enter the year)

This point should contain information on the global site-sharing policy, especially on the implementation of the site-sharing policy stated in the bid submitted to public tender for the allocation of licenses for the international mobile telecommunications systems (IMT2000/UMTS), specifically including the number of sites actually shared, the identification of the locations, and the entities involved.

PART B

Elements to be presented in support of the coverage results reported in Part A of this questionnaire:

In addition to the response to Part A of the questionnaire, the responding company should send ANACOM a description of the coverage(s) in outdoor areas considering reception at 1.5 m above the ground, on maps of an appropriate scale (at least 1:1 500 000 for the national territory). The assumptions and methodology used to calculate the reported coverages should be indicated, and the following details should be indicated, per type of service:

- maps used in the calculations, including population maps;
- propagation model(s);
- measurements taken for the calibration of the propagation models used;
- location of the base stations that provide the service, including the type of antennas used and their radiation diagrams, as well as the associated technology and bandwidth;
- calculation of the link budget(s), including parameters per reported speed such as the sensitivity value, SINR, Eb/No, type of modulation, etc.