

TELEFÓNICA UK LIMITED RESPONSE TO:

**“Coverage obligations in the 700 MHz and 3.6 – 3.8 GHz spectrum
award:
Ofcom’s approach to verifying compliance”**

NON-CONFIDENTIAL VERSION

I. INTRODUCTION

1. Telefónica UK Limited (“Telefónica”) welcomes the opportunity to respond to Ofcom’s consultation on Coverage obligations in the 700 MHz and 3.6 – 3.8 GHz spectrum award: Ofcom’s approach to verifying compliance.¹
2. Our response to this consultation should be considered by Ofcom alongside our response to Ofcom’s main consultation on the award of the 700 MHz and 3.6 – 3.8 GHz spectrum bands.² In that response, we highlight several concerns in relation to Ofcom’s proposed coverage obligations, its approach to verifying compliance, as well as other related considerations, such as Ofcom’s estimates of the level of coverage that operators will achieve, absent coverage obligations and issues such as the cost of meeting the proposed obligation and the number of sites that operators would need to build to achieve incremental increases in their coverage.
3. Our response to the current consultation, however, focusses on Ofcom’s proposals in relation to its approach to verifying compliance, of which we also have several concerns. The most alarming being Ofcom’s proposal to calibrate its approach to verifying compliance by reference to an individual operator’s assessment of its own level of coverage.
4. Based on the proposals Ofcom has presented in the consultation, our view is that, as currently set out, Ofcom’s approach is fundamentally flawed. This is due to the fact that it would mean an operator which over-estimates its own coverage would not be required to meet Ofcom’s 90% geographic coverage obligation. Instead, the obligation would be reduced by the difference between the operator’s assessment of its own coverage and Ofcom’s assessment of its coverage. In this way, an operator that has over-estimated its own coverage would (perversely) be rewarded because it would not need to roll-out its network as extensively as an identical operator (which had not over-estimated its own coverage), in order to comply with Ofcom’s geographic coverage obligation. As such, an operator that has over-estimated its own coverage, would face lower costs to comply.
5. Awarding coverage lots on the basis of this approach, would appear to be arbitrary, biased and unfair. If this were to be the case, there would be clear (and perverse) discrimination against operators that do not over-estimate their own level of coverage.

¹https://www.ofcom.org.uk/_data/assets/pdf_file/0022/135157/Consultation-Coverage-obligations-in-the-700-MHz-and-3.6-3.8-GHz-spectrum-award-Ofcoms-approach-to-verifying-compliance.pdf

²https://www.ofcom.org.uk/_data/assets/pdf_file/0019/130726/Award-of-the-700-MHz-and-3.6-3.8-GHz-spectrum-bands.pdf

We think that such a scheme is absurd and would be inconsistent with Ofcom's statutory duties.

6. Telefónica strongly recommends that Ofcom works with operators to agree a single, common, objective coverage assessment model for all operators. It is important to have a method which assesses coverage in a way that is consistent and fair and which avoids creating perverse incentives for operators to exaggerate their coverage to reduce their rollout and costs, at the expense of operators that do not over-estimate their coverage. This agreement must be done in advance of any award of coverage obligations so that each operator can then be baselined using a truly single model, providing clarity over what will be required of them to meet the coverage obligation.

II. GENERAL COMMENTS

7. We strongly agree with Ofcom's view that it is important to ensure that, for any obligations placed in operators' licences as a result of this award, Ofcom has a clear, robust and consistent approach to check that they been met. This will support informed bidding for parties interested in acquiring the obligation.
8. However, we have serious concerns that, as set out in the consultation, Ofcom's compliance methodology lacks a fair basis for comparing operators and risks creating incentives for operators to exaggerate their coverage in order to reduce the network rollout required to meet the coverage obligations. This in turn creates a bias – an operator which over-estimates its coverage is more likely to bid for (and win) a coverage lot compared to an identical operator which doesn't.
9. In its main consultation on the award of the 700 MHz and 3.6 – 3.8 GHz spectrum bands³, Ofcom proposes that the coverage obligations themselves (two coverage lots), each comprise the following requirements:
 - provide a good quality mobile service outdoors in at least 90% of the UK landmass, including at least 90% of England, 90% of Northern Ireland, 74% of Scotland and 83% of Wales;
 - provide good quality service outdoors for at least 140,000 premises to which it currently does not provide good coverage; and

³ <https://www.ofcom.org.uk/consultations-and-statements/category-1/award-700mhz-3.6-3.8ghz-spectrum>

- deploy at least 500 new wide area mobile sites.
10. In the current consultation, Ofcom sets out the criteria and methodology it intends to impose for assessing compliance with each of the proposed coverage obligations, including the coverage model it intends to use.

The importance of a clear, robust, consistent approach

11. At §2.9 of the consultation, Ofcom states:

“As set out in the December 2018 consultation, we consider it is important that, for any obligations placed in operators’ licences as a result of this award, Ofcom has a clear, robust and consistent approach to check this has been delivered. This will support informed bidding for parties interested in acquiring the obligation. In light of these objectives, we have considered whether our starting point for assessing compliance with our geographic coverage requirement should be the outputs of the operators’ own predictive radio planning tools used for their own coverage planning purposes, a single model issued by Ofcom, or a combination of these approaches.”

12. Telefónica strongly agrees with Ofcom that, for any obligations it places in operators’ licences as a result of this award, it is important that Ofcom has a clear, robust and consistent approach to check they have been delivered. This will support informed bidding for parties interested in acquiring the obligation.

The benefits of using a single model

13. At §2.10, Ofcom then proceeds to outline it’s consideration of a single model for assessing compliance, by citing the 2013 800 MHz award which used a single model.

“We believe there is merit in taking a similar approach for this award, since a single model will ensure that the coverage provided by each of the obligated operators will be assessed against the same criteria, and that the incremental coverage provided to meet the obligation can be robustly assessed. Specifically, using a single model would enable us to address concerns that, because individual operators use different models and underlying assumptions, the coverage that an operator might ultimately be required to roll out could vary depending on how their model behaves. This could impact outcomes for consumers, and the extent of benefit delivered in exchange for the discount we are proposing to offer in the auction.”

and at §2.11:

“A single coverage model also mitigates the risk of operators’ models changing during the course of the process. This could happen because operators choose to amend their models, or procure different solutions, for a number of reasons. These reasons could also include changes in operators’ incentives to accurately report coverage faced with the requirement to meet a coverage obligation, and that some operators may wish to update or change these models before the obligation falls due”

14. Telefonica strongly agrees with these statements. We believe that the obligation must be measured using a single model, common to all bidders. By doing so, there can be no doubt about the comparison of the parties bidding for the obligation, being fair.

15. Telefónica recommends that Ofcom uses a single, common, objective model to assess coverage for all operators in a way that is consistent and fair. We agree with Ofcom’s proposal to use ITU-R P.1812-4, which is a public open standard and is transparent to all bidders. The fairest way to assess coverage and verify compliance with the coverage obligation is to request all operator site data in raw form, then run it through the ITU model. That gives you the baseline. The exercise is then repeated following the deadline required to meet the coverage obligation, in order to verify compliance. This is the process that was used to verify compliance with the 800 MHz spectrum licence coverage obligation.

16. At §2.12 Ofcom states:

“...we also recognise that operators have developed their own processes for measuring the coverage that they provide today and we undertake testing to satisfy ourselves that their coverage predictions are reasonable.”

17. Telefónica is pleased that Ofcom recognises the benefit and value of operators own models. [✂]

Calibrating Ofcom’s model using operators own coverage predictions to measure the 90% coverage requirement

18. At §2.13 in the consultation, Ofcom states the following:

“On balance, we consider it appropriate to provide operators with a single model developed by Ofcom for estimating their geographic coverage. This model will provide a single measure of the coverage increment that each of the obligated operators will deliver in order to comply with the coverage obligations and ensure, therefore, a consistent approach. To take account of the operators’ own view of their coverage, we will calibrate the compliance

threshold for Ofcom's model for each of the obligated operators so that it reflects the increment between the operator's own baseline and our requirements (i.e. 90% for the UK, and specific thresholds in each nation)."

19. Ofcom's statement that it proposes to provide operators with a "single model" is misleading. Ofcom's proposed single model is very different from the true single model approach used for the 800 MHz award. The model proposed by Ofcom to verify compliance with the 90% coverage obligation, is not a single model, but rather a hybrid model, which uses a calibration method based on each obligated operators' own coverage predictions at the time of the award. This is something that was not part of the model to measure compliance with the coverage obligation in the 800 MHz award in 2013.

20. At §2.8 of the consultation, Ofcom states that it's proposed approach:

"...mirrors the approach Ofcom has taken to verifying compliance with mobile coverage obligations in the past, where we have used a combination of modelled coverage and on the ground testing. We also use a combination of coverage predictions generated by operators' models, and our own verification, for the coverage information we use in our annual Connected Nations reports and to populate the coverage maps for our 'mobile checker app'."

21. This statement is misleading as the 98% coverage obligation in the 800 MHz award in 2013, was assessed using an agreed model which was an ITU standard, whereas Ofcom's proposed approach to measure compliance with the 90% obligation, includes using operators own coverage predictions. Such predictions are based upon models which vary and are likely to produce different levels of coverage for the same data i.e. inconsistency between operators and inaccuracy over actual coverage. As a result, Telefónica strongly recommends that Ofcom uses a truly single, standardised model to assess coverage levels and verify compliance with coverage obligations.

22. In §1 of the consultation, Ofcom states:

"We now set out our plans for assessing compliance with these obligations in order to ensure that real improvements are delivered for consumers. In doing so, we specify a process that we consider is robust and equivalent across different operators, and practical for us to assess."

and;

"We have developed a coverage prediction model which we propose to use to assess compliance with the geographic coverage requirement. The coverage

threshold for compliance using this model will be calibrated with reference to each obligated operators' own coverage predictions at the time of the award. Our verification exercise for assessing the final coverage level may include on the ground testing in a number of locations."

23. At §2.7 Ofcom then states:

"In principle, comprehensive on the ground testing would be the most accurate approach to assessing coverage levels across the UK and the nations, but the amount of testing required to do this makes it impractical. Predictive methods provide an alternative and efficient means of assessment which overcomes some of the challenges of comprehensive on the ground testing, such as the scale of the measurement exercise that would be needed and accessing difficult terrain. We consider that such predictive methods provide a practicable assessment methodology in terms of scale of effort and accuracy, which we intend to complement with a verification process that may include on the ground testing."

24. Telefónica strongly disagrees with Ofcom's view that the plans it has set out for assessing compliance with the obligations, specify a process that is robust and equivalent across different operators. On the contrary, the process, which incorporates calibrating its approach with reference to an individual operator's assessment of its own coverage, is fundamentally flawed.

25. Ofcom's statement that its verification process "may" include on the ground testing, is, at best, vague. Furthermore, even if such field testing were to be undertaken by Ofcom as part of checking compliance with the obligation, following the award, it would be too late. If Ofcom intends to calibrate its verification process with reference to operators own estimates of coverage levels, as it has set out in the consultation, then it *must* conduct field testing *prior to the auction*, in order to properly verify the existing level of operators coverage. This will ensure that if an operator over-estimates their actual level of coverage, it will be detected and suitably adjusted by Ofcom, thus avoiding any unfair distortion, which would otherwise occur by using operators estimates (which could be over-estimates) of their own coverage, as an input to measuring compliance.

26. We disagree with the proposal, as set out in the consultation, whereby Ofcom intends to calibrate the model against operators own coverage estimates, for the following reasons:

- When comparing radio models there are many variables to be taken into account, specifically, but not limited to:
 - i. DTM (Digital Terrain Model)

- ii. Clutter
- iii. Propagation Models
- iv. Local calibration

27. As a result of these variables, the models potentially have a non-linear relationship, thus when one model states the necessity to gain x percentage points, this may or may not be the same as gaining x percentage points in a different model. In order to remove this inconsistency, we believe that the obligation should be measured using a single model common to all bidders.

Self-reporting has meant current coverage modelling assumptions are inconsistent, leading to the wrong counterfactual

28. As we explain in our response to Ofcom’s main consultation on the award of the 700 MHz and 3.6 – 3.8 GHz spectrum bands, Ofcom has forecast the volume of sites required to reach 90% landmass coverage against a counterfactual of operators starting with a landmass coverage of 80% by June 2019. [36]

29. It would appear that this divergence in assessment originates from Ofcom’s Connected Nations report, an extract of which is copied below. Telefonica believes that the coverage levels reported, significantly over-estimate actual landmass coverage.

Table 1: Estimates for existing coverage by operator, as published by Ofcom

	Voice Coverage			4G Data Coverage		
	Landmass	Outdoor premises	Indoor premises	Landmass	Outdoor premises	Indoor premises
BT/EE	85.0%	99.4%	95.8%	84.4%	99.1%	88.4%
O2	90.4%	99.8%	99.1%	74.4%	98.9%	94.8%
H3G	84.8%	99.5%	95.9%	78.4%	98.6%	89.4%
Vodafone	90.4%	99.8%	98.6%	78.6%	99.0%	93.7%

Source: Ofcom Connected Nations 2018

30. [36]

31. [36]

32. This has consequences for Ofcom's proposed approach to use an individual operator's assessment of its own level of coverage to calibrate its approach to verifying compliance with the 90% coverage obligation.
33. This is evident when one considers an operator which over-estimates its own coverage, compared to Ofcom's assessment of its coverage, as that operator would not be required to meet Ofcom's 90% geographic coverage obligation. Instead, the obligation would be reduced by the difference between the operator's assessment of its own coverage, and Ofcom's assessment of its coverage. In this way, an operator that has over-estimated its own coverage would (perversely) be rewarded because it would not need to roll-out its network as extensively as an identical operator (which had not over-estimated its own coverage), in order to comply with Ofcom's geographic coverage obligation. As such an operator would face lower costs to comply. Awarding the coverage lots in this way would appear to be arbitrary, biased and unfair.

34. At §2.20, Ofcom say the following:

"We would expect any difference in the predictions for the UK-wide and nation-wide geographic coverage levels resulting from the operators' models and Ofcom's model to be relatively small. If a large difference is observed, we would seek clarifications from the relevant operator and engage with them in order to achieve greater alignment of the two models."

and at §2.21:

"If Ofcom's model predicts a significantly greater coverage level than an operator's own predictions (which we currently consider unlikely), we propose to cap the level of coverage that the relevant operator would have to meet on Ofcom's model at 95%."

and at §2.32:

"Operators provide us with their coverage predictions on a monthly basis for our mobile checker app and three times a year for our Connected Nations reports. We regularly monitor operators' predictions and currently consider them to provide a reasonably accurate representation of the level of mobile coverage which is actually provided on the ground."

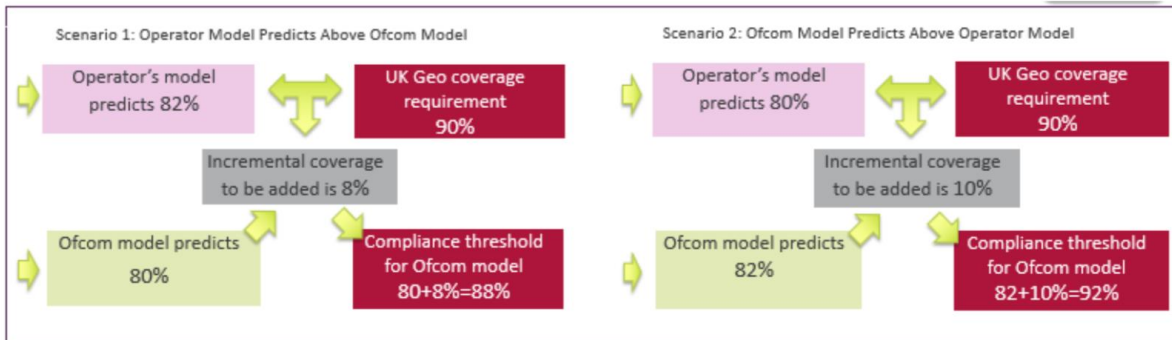
35. Ofcom must clarify what, exactly, it perceives to be an acceptable tolerance in the case of an operator over estimating its own level of coverage. Simply stating “very small” doesn’t provide sufficient clarity. Ofcom needs to clarify how it would deal with the various scenarios that could arise. Ofcom states that it will cap at 95% for under predicting, but it has not clarified what the cap would be the other way i.e. in the event of over predicting by an operator.

Seeking to rely on operators’ inconsistent coverage models to formulate coverage obligations would constitute a breach of Ofcom’s statutory duties

36. Using operators’ self-reported coverage estimates as part of Ofcom’s proposed approach to verify coverage obligations, creates a perverse incentive on operators that do decide to bid in the auction, to use misleading, less-conservative coverage models, with the effect of reducing the network rollout necessary to comply with the coverage obligations. This discriminates against operators that do not over-estimate their own coverage. The proposed approach creates a bias whereby an operator which over-estimates its coverage is more likely to bid for (and win) a coverage lot compared to an identical operator which doesn’t over-estimate its coverage. We think that such a scheme would be inconsistent with Ofcom’s statutory duties.
37. Ofcom is proposing to allow operators to measure their own coverage and then compare their estimate against Ofcom’s model. Compliance with the coverage obligation would then be calibrated by reference to the difference between the two estimates. This process is illustrated below⁴

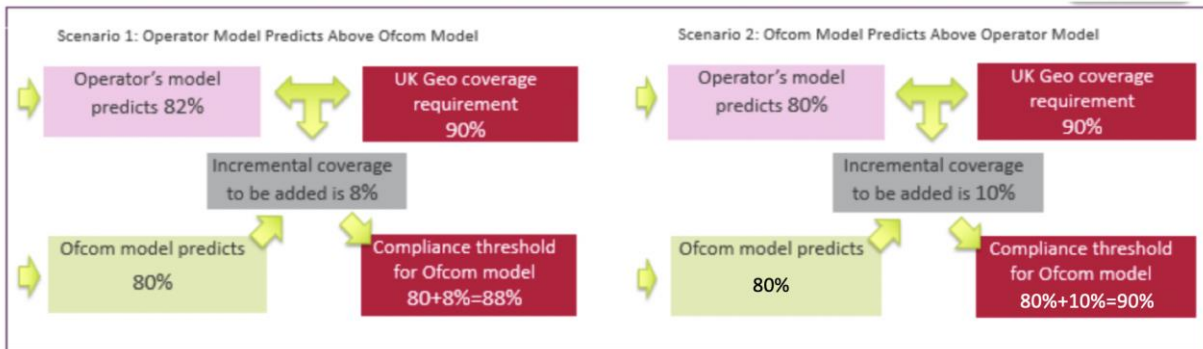
⁴ Figure 2.1 in the consultation

Figure 1: Illustration of Ofcom’s process for establishing the compliance threshold in Ofcom’s model, as taken from the Coverage Obligation consultation



38. We are concerned that Ofcom’s proposed approach to assessing compliance with the coverage obligation would generate inefficient, arbitrary and unfair outcomes, because it would incentivise operators to over-estimate their current coverage in order to reduce the requirements for meeting the obligation.
39. Consider a scenario, as illustrated below, in which two operators (Operator 1 and Operator 2) share exactly the same sites and spectrum portfolio and, therefore, provide identical coverage, then assume that one operator uses different modelling parameters which over-estimate its expected total coverage. Say Operator 1 is using a more optimistic coverage assessment model that predicts it provides 82% coverage. The other operator (Operator 2), with more realistic parameters, predicts that it provides 80% coverage. Ofcom’s modelling predicts that both operators’ coverage is 80%. According to the logic laid out in Figure 1, and repeated in Figure 2, Operator 1 would be required to reach 88% coverage in order to comply with the coverage obligation, whereas Operator 2 would be required to reach 90%. Operator 1 would win the coverage lot, because it would face lower costs in reaching 88%. This appears to Telefonica to be a completely arbitrary and unfair means of allocating coverage lots.

Figure 2: Ofcom’s process for establishing the compliance threshold (as in Figure 1), with adjusted inputs.



40. Ofcom’s proposed approach to assessing compliance risks leading to the inefficient distribution of spectrum and would provide consumers with misleading information about levels of coverage. This appears to be inconsistent with its statutory duties.

41. Telefonica strongly recommends that Ofcom works with operators to agree a single, common and objective coverage assessment model for all operators.

[X]

42. [X]

[X]

43. As mentioned above, Telefonica believes that Ofcom and the operators need to agree a common and realistic model to measuring coverage for the purposes of this auction. This would help to provide a more accurate level of coverage; and one which would reflect the coverage consumers actually experience. It would also create an objective starting position for Ofcom to assess the costs of increasing mobile coverage.

44. [X]

45. [X]

46. Telefonica has gained considerable expertise in designing and measuring network performance and we would welcome the opportunity to share this with Ofcom in reviewing the approach to improving mobile coverage.

Supplied model for assessment.

47. [X]

48. [X]

49. [X]

50. In light of the above, we would welcome further engagement and analysis of this with Ofcom in order to arrive at a sensible model.

Ofcom's approach to coverage obligation compliance is unrealistic.

51. Ofcom's timeframe for roll-out is very tight, especially given that operators will be starting from a lower base than currently assumed by Ofcom. Given the high risk of unexpected delays when deploying sites in difficult terrain, it would be risky for operators to sign up to this timetable.

EAS Sites

52. If the use of EAS sites is to be excluded from the calculation method and, given that these sites are likely to often be the only possibility to cover these hard to cover reach areas, the landmass that sits within these areas should be deducted from the target. Otherwise the 90% obligation becomes a de facto higher target.

Datasets for defining UK landmass

53. The datasets for defining the UK landmass are ambiguous. We wish to highlight the following concerns:

- The Ordnance Survey Boundary Line product contains at least two different definitions of the landmass of the UK; the main difference being the choice between Mean High Water and Mean Low Water for the extent of the landmass.

- Concerning the 90% landmass obligation, Ofcom published (in 2015) the document "Voice Coverage Obligation Notice of Compliance Methodology"⁵ which included the method for determining the UK landmass. It would appear (from inspection of the supplied model for the 700 MHz obligation) that Ofcom is not using this definition for the model.
- We require clarity on the precise definition of landmass to be covered.

54. We request that Ofcom clarifies these definitions in order to provide certainty.

Compliance Criteria – New Sites

55. At §A5.43, Ofcom states that in order to comply with the new sites requirement, the obligated operators will be required to deploy at least 500 sites that meet certain conditions. One of these conditions is that a new site, as defined by Ofcom, must be a new site for the obligated operator i.e. in addition to the sites which comprise the electronic communications network which the licensee uses to provide mobile telecommunications services, as at the date on which the licence containing the Coverage obligation is first issued.

56. We request that Ofcom clarifies that new sites can include shared sites, e.g. where two or more operators provide their own service to customers, but site share under a formal agreement.

Premises requirement dataset

57. At §A5.52, Ofcom states that it will use the premises data from the Ordnance Survey (OS) Addressbase Premium dataset (August 2018, Epoch 60) and the OS Addressbase Islands dataset (August 2018, Epoch 60).

58. Telefónica requests further detail on this. The Addressbase Premium product contains many premises, some are not built, some demolished, some residential, some business. We need to understand the details of any processing carried out on this dataset. We do not believe it can be used to provide an accurate view of premises without post processing of the supplied data.

⁵ https://www.ofcom.org.uk/_data/assets/pdf_file/0027/82377/voicecov-compliance-final-20150130.pdf