



Non-Confidential

Vodafone Response to Ofcom  
Consultation:

Award of the 700 MHz and  
3.6-3.8 GHz spectrum bands  
Revised proposals on auction design



# Executive Summary

Vodafone welcomes Ofcom revised proposals for the auction design associated with the award of 700 MHz and 3.6 GHz spectrum. We agree with much:

- The Shared Rural Network (SRN) scheme delivers superior coverage for all consumers, when compared to the alternative of one or two licensees being awarded discounted spectrum in return for improving coverage. We are happy to see coverage lots removed from the auction.
- There is little inter-band aggregation risk to justify use of a Combinatorial Clock Auction (CCA) design. Removal of coverage lots via operator commitment to the SRN obviates any need to use CCA in order to accommodate this, so we welcome the proposal to use a Simultaneous Multiple Round Ascending (SMRA) auction.
- The imposition of an overall cap on spectrum is consistent with earlier awards, hence promoting regulatory certainty. There is no justification for a cap on coverage spectrum.
- The auction design is further simplified by omitting the ability to withdraw bids, and the ability to specify a minimum spectrum requirement.
- The reserve pricing for 700 MHz lots appears appropriate, given the costs involved in clearing the band. Similarly, the ratio of eligibility points between the lot types seems reasonable.
- Keeping Assignment Stage bids confidential is sensible, given there is some scope for post-auction trading.

However, there are a few areas where we believe Ofcom should think again:

- Ofcom is failing in its duty of care to ensure that all operators have the opportunity to acquire sufficiently large blocks of 5G-capacity spectrum, potentially resulting in irreparable damage to competition in 5G services. The proposals to assist in defragmenting the 3.4-3.8 GHz band are unambitious, fail to meet European Commission mandates to make available large blocks of contiguous spectrum, will have ongoing eco implications at a time when there is renewed focus on energy efficiency, and are inferior to alternatives put forward by Vodafone and Telefonica.
- The proposals fail to address the potential damage of ~~3~~. We believe there are compelling reasons for Ofcom to make clear that Three's future Annual Licence Fees (ALFs) for existing 3.6 GHz spectrum will be reviewed in light of the auction outcome, or absent this to impose a safeguard cap.
- The usage of 5 MHz lots in the 3.6 GHz band ~~3~~. Vodafone considers that either the lot size should be 10 MHz, or alternatively that Ofcom should impose a minimum bid size, given there is no realistic use case for 5 MHz of spectrum.
- The proposed reserve price for 3.6 GHz lots is too high and will significantly impede the scope for price discovery in early rounds. It may be reflective of prices achieved in the 3.4 GHz auction, but is



set considerably higher than the clearance costs/likely benefits of alternate (non-mobile) usage. Ofcom must question what it would do if lots failed to sell at the currently proposed reserve price, given it would then have no alternative usage for the spectrum that would yield anything like the value that would have been obtained if a lower reserve had been adopted.

When combined with the need to place deposits in-line with required Eligibility Points/bidding in early rounds of the Principal Stage, such high reserve pricing will mean that bidders need to provide Ofcom with outlandish deposits. ✂



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# 1. Introduction

Vodafone welcomes Ofcom's revised proposals for the auction design associated with the award of 700 MHz and 3.6 GHz spectrum. In this response, we confirm the aspects of the proposed auction design that we agree with – of which there are many – before setting out the areas where we believe the auction format should be improved to benefit consumers and competition. Where we disagree with Ofcom's conclusions, we recommend ready alternatives available within the overall structure proposed by Ofcom and with no material impact on auction timelines.

## 2. Aspects of the auction design with which we agree

### 2.1 Removal of bidding to provide mobile coverage

Vodafone has set out at length in previous consultation responses<sup>1</sup> that we disagreed with both Ofcom's analysis of the costs of unilaterally increasing coverage, and a previously-proposed bidding approach that implicitly favoured those operators which had already received subsidies – whether overtly via State aid or via discounted spectrum in exchange for taking on previously-imposed coverage obligations. We set out that there was no reason to bundle coverage obligations with spectrum, if there were alternative means to deliver coverage.

The Shared Rural Network (SRN) as devised by the mobile operator community, with extensive input from both Ofcom and Government, is a game-changing initiative. Compared to the auction obligation approach, it will improve coverage to a greater extent (95% vs 90%), will improve it for customers of all mobile networks (rather than one or two), and will deliver this benefit using fewer new masts, hence at less cost to the taxpayer and less disruption to the rural landscape. It truly is a win-win-win-win initiative for Government, Ofcom, the mobile operators and mobile customers. We are aware that regulators in other countries are taking a keen interest, and are hopeful that the UK's lead in improving mobile coverage will be repeated elsewhere. It would not have been possible without constructive input from all stakeholders, and it is incumbent on us all to get the agreement over the line.

With SRN in place, the spectrum award can revert to being just that. There is no need to conflate the award of spectrum with coverage, and Ofcom can take a clean sheet approach in designing the auction. Vodafone fully supports the removal of coverage obligations from the auction exercise.

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<sup>1</sup> "Vodafone Response to Ofcom's Consultation: Improving mobile coverage - Proposals for coverage obligations in the award of the 700 MHz spectrum band", May 2018, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0012/115401/Vodafone.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0012/115401/Vodafone.pdf)  
"Vodafone Response to Ofcom Consultation: Award of the 700 MHz and 3.6-3.8 GHz spectrum bands", March 2019, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0027/143496/vodafone.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0027/143496/vodafone.pdf)



## 2.2 Choice of Simultaneous Multi-Round Ascending (SMRA) auction format

Once again, Vodafone has set out at length in previous consultation responses the reservations we have about the Combinatorial Clock Auction (CCA) design. Like Ofcom, we do consider that it should be a candidate design in some scenarios, for example where there is a significant aggregation risk between different types of spectrum lots or strong complementarities between the different bands on offer. However, it does have shortcomings meaning it should be adopted sparingly, and we are more comfortable with the SMRA approach for situations such as that faced in this auction.

We acknowledge that the combination of coverage lots and spectrum lots could have created an aggregation risk, and that the choice of CCA was one (but by no means the only) way of managing that risk. However, with coverage lots now removed from the auction, there can be no justification for using the CCA format – bidders' demand for 700 MHz spectrum will not be influenced by their demand for 3.6 GHz spectrum to any meaningful extent. Therefore, in common with other stakeholders, Vodafone strongly prefers the SMRA format for the Principal Stage of the auction.

## 2.3 Overall spectrum cap, coverage spectrum cap

We note that Ofcom has previously reached a policy position that in a four-player market, Ofcom would have concerns about an operator possessing more than 35-40% of spectrum overall, and has adopted 37% as an overall cap on spectrum holdings in support of that. Vodafone is comfortable with Ofcom's proposal to cap overall holdings at 416 MHz.

Vodafone also agrees that there is no justification for a sub-cap on low frequency holdings. We consider that an appropriate breakpoint for coverage spectrum would encompass the 1800 MHz and probably 2100 MHz bands, given that these are demonstrably used as coverage layers already<sup>2</sup>. Using this definition, there can be no suggestion that any operator has insufficient coverage spectrum. However, even if a definition of sub-1GHz was used – with which we profoundly disagree – it can be readily shown that neither Vodafone or Telefonica have the realistic ability to bid to a level that would exclude both BT-EE and Three from acquiring 700 MHz spectrum (and further, the auction rules would preclude Vodafone or Telefonica being aware that they're succeeding in a hypothetical strategy of excluding BT-EE and/or Three, rendering such an approach void<sup>3</sup>).

However, as set out in Section 3.1, we believe that a safeguard cap on 3.4-3.8 GHz spectrum could be appropriate should Ofcom not adopt our preferred approach of aligning Three's incentives with other bidders via clarifying the position on its future Annual Licence Fees.

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<sup>2</sup> See Vodafone March 2019 response to Concern 2d (Question 3) for rationale behind this conclusion.

<sup>3</sup> For the avoidance of doubt, given we don't agree that "sub-1GHz" spectrum represents any special value, we have no interest in such a strategy in any case.



## 2.4 Waivers, withdrawals and minimum requirement

Vodafone considers that the ability to use waivers to step away from a round of the SMRA Principal Stage is useful for the reasons set out at para 3.76 of the consultation, and imposes minimal complication into the auction design.

With respect to withdrawals, we agree with Ofcom's assertion that the spectrum on offer does not represent sufficiently-close substitutes to justify auction rules that facilitate changing of demand between the lot types (although, of course, we do not rule out the ability/flexibility for bidders to do this). We agree with Ofcom's analysis that facilitating the withdrawal of bids would significantly complicate the auction design. As such, we concur with the proposal not to incorporate withdrawals into the auction design.

With respect to bidders expressing a minimum spectrum requirement, there are a series of differences to the 2.3/3.4 GHz auction:

1. In the 700 MHz band, whilst we note that although bidders may place particular value on obtaining a minimum of 2x 10 MHz spectrum, Three and BT's holdings in the adjacent 800 MHz band demonstrates that there is a use case for 2x 5 MHz. Should a bidder require 2x 10 MHz as a minimum, they will be fully able to express that by re-bidding should they fail to become a [full] Standing High Bidder in a particular round of the auction.
2. Once again, in the 3.6 GHz band, bidders are fully able to continue bidding until they are a Standing High Bidder on their minimum spectrum requirement; there is no need for auction rules to facilitate this. Further, we note that to a degree the 3.6 GHz award represents a "second bite of the cherry", with all operators already having at least 40 MHz of similar spectrum.

Therefore, Vodafone agrees with Ofcom's conclusions not to allow bidders to demand a particular minimum requirement. Notwithstanding this, as we set out in Section 3.3, there is a case to consider a "minimum bid" requirement, i.e. that bidders must place bids on at least a specified amount of spectrum.

## 2.5 Reserve pricing and lot sizes for 700 MHz

We believe that the reserve prices for 700 MHz lots (both paired and supplementary downlink) proposed by Ofcom are appropriate. Please see Section 3.4 for observations on 3.6 GHz reserve pricing.

Similarly, we believe that Ofcom has determined the correct lot size for 700 MHz paired and centre gap frequencies. We consider that lot sizes in the 3.6 GHz are worthy of discussion – see Section 3.3.

## 2.6 Eligibility Points

Vodafone agrees with the ratio of Eligibility Points proposed by Ofcom.

## 2.7 Confidentiality of Assignment Stage bids

As we set out in Section 3.2, Vodafone does not agree with the approach adopted by Ofcom with respect to defragmentation of the 3.4-3.8 GHz band. However, if Ofcom proceeds with this approach, there is a strong



possibility of negotiations relating to spectrum trades between some parties during the Assignment Stage, and at least a slim chance of negotiations between other parties after the auction.

Notwithstanding our pessimism about the prospect of success for these post-auction negotiations, Vodafone believes that making the Assignment Stage bids available would reveal confidential information that would totally destroy any chance of reaching agreement. Therefore, we agree with Ofcom's approach of not publishing this data, and pragmatically would go further; we believe the bids should only be shared within Ofcom on a need-to-know basis, and that the information be destroyed after the auction. There may also be merit in designing the auction system such that bids that don't determine the final auction price are discarded and not visible to Ofcom themselves. This minimises the risk of insight or knowledge being inadvertently and unintentionally transferred at some point in the future.

### 3. Aspects of the auction design requiring improvement

Whilst there is much to praise in the proposed auction format, there are some areas that need improvement to secure a better result for the UK economy. Thriving competition in a 5G-era necessitates all four mobile operators having the opportunity to secure appropriate spectrum – this is spectrum to achieve coverage, and large contiguous blocks of capacity spectrum. No operator has a paucity of coverage spectrum, and we are confident that the proposals for the 700 MHz band allow everyone to compete on a level playing field to secure additional stocks. ✕ In this section, we set out practical measures that will ✕ constrain more extreme market manipulation.

We also highlight that some of the proposed decisions around reserve pricing and lot sizes could serve to prevent efficient operation of the award, and again propose alternatives.





### 3.1 Potential ✂

✂ Of course, Ofcom has previously argued (and Vodafone agrees) that particularly when examining overall spectrum stocks, there is no reason for operator holdings to be equal. However, in this band, it must be acknowledged that inherently if any operator holds greater than 100 MHz, then conversely one or more operators must hold less than 100 MHz, which is in tension with the European Commission implementing decision instructing that all operators be afforded the opportunity to secure large contiguous blocks, ideally of 100 MHz:

*There shall be spectrum available providing the opportunity to access sufficiently large portions of **contiguous spectrum, preferably 80-100 MHz**, for wireless broadband electronic communications services”*

Three already holds 140 MHz, which is almost 36% of 5G capacity spectrum (i.e. the 3.4-3.8 GHz band). ✂

The situation can easily be remedied by Ofcom if the ALFs payable on Three’s 3.6 GHz spectrum were to be varied in line with the auction outcome. We note that at the moment Ofcom has left the matter somewhat ambiguous<sup>5</sup>:

*We always retain the ability to revise fees in the future in appropriate circumstances, including after the forthcoming auction of 700 MHz and 3.6-3.8 GHz spectrum, if we consider there is evidence to suggest a revision to fees is warranted, i.e. if there is strong evidence that a material misalignment has arisen between the level of the fees and the value of the spectrum*

If Ofcom was to give a clearer steer that the 3.6 GHz ALFs **will** be reviewed in light of the 3.6 GHz auction, then this would put Three in the same position as every other bidder – their marginal bid would impact on the cost base of all of their spectrum (albeit via ALFs rather than direct auction pricing).

We note that in their response to that consultation<sup>6</sup>, Three expressed the reverse concern, that *we* might be incentivised to price-drive in the 3.6 GHz auction in order to increase *their* ALFs. This suggestion lacks credibility – firstly it suggests that we’d be prepared to pay more money to Ofcom if it meant that Three had to pay even more (a real case of cutting off our noses to spite our faces), and secondly to do this would impact upon cash that we need to pay out to Ofcom during the auction in 2020, with the hoped payback of Three eventually having to pay more in ALFs being perhaps ten or fifteen years in the future. It makes little sense.

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<sup>4</sup> <https://ec.europa.eu/digital-single-market/en/news/commission-decides-harmonise-radio-spectrum-future-5g> Annex of the Implementing decision, para B.3; we note that the UK Government has committed to alignment with the European Union on such issues, regardless of Brexit considerations.

<sup>5</sup> *ibid.*, para 4.34

<sup>6</sup> “Three’s response to Ofcom’s Consultation on Annual Licence Fees for UK Broadband’s 3.4 GHz and 3.6 GHz spectrum” Section 2 para 1.14, [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0020/140267/three.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0020/140267/three.pdf)



There is also every possibility that adopting this approach would benefit Three. Were 3.6 GHz to sell at a lower unit cost than 3.4 GHz (which is not an outlandish prospect, given that all operators now have *some* 5G spectrum and in particular, Three now has all the spectrum it is likely to need), it may well be that Three's ALF would be reduced following a review.

**We therefore urge Ofcom to be unequivocal on the issue, and to make a firm statement that Three's 3.6 GHz fees will be reviewed in light of the auction outcome.**

In the alternative that Ofcom is not minded to make such a statement, then the only alternative is to cap Three's 5G capacity holdings, reflecting that they already hold 40% more spectrum than any operator in comparator markets, and that adding to this total will only serve to deprive competitors of spectrum.

### **3.2 Defragmentation of the 3.4-3.8 GHz band**



The European Commission Implementing Decision on 5G spectrum could not be clearer in instructing administrators to make contiguous spectrum available. Ofcom's proposals fail to address this instruction, leaving a hope that operators will somehow resolve the matter themselves.



In the response to the defragmentation consultation<sup>7</sup>, Vodafone set out a means by which the whole 3.4-3.8 GHz band could be defragmented, in line with the Commission Implementing Decision. Although we pointed to a potential approach whereby Three could bid at a negative level, in the interests of simplicity our preferred model is that Three would be guaranteed the 100 MHz contiguous spectrum that it currently holds<sup>8</sup>, but that it may be required to change frequencies to accommodate the provision of contiguous spectrum for the other licensees. We consider that proposal credible, and even-handed in that Three could not end up with less contiguous spectrum than today, and would be compensated for adjusting its frequencies from the auction revenues (although we consider the cost implications for Three would not be significant, given its 5G rollout has now been delayed until 2020<sup>9</sup>). Three's reasonable costs of adjusting frequency would be independently assessed, encompassing a proportionate uplift for inconvenience of the exercise.

Ofcom should incentivise Three's participation in a full 3.4-3.8 GHz defragmentation programme by making it a condition of their entry to the auction; there is every justification for such an approach on both spectrum management and competition grounds (and, whilst Ofcom does not have an overt duty, a particular justification on eco-grounds). Three would not be disadvantaged, as it would be adequately compensated. We note that Telefonica made similar suggestions in its response. Ofcom has a duty of care to manage spectrum efficiency and have due regard to European decisions. It is therefore very disappointing that it has

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<sup>7</sup> July 2019 response, Q3

<sup>8</sup> In addition, that its separate 40 MHz would stay intact, but with no guarantee of adjacency to the 100 MHz block.

<sup>9</sup> "Three 5G launch delayed until Q1 2020", <https://www.techradar.com/uk/news/three-5g-launch-delayed-until-q1-2020>



failed to even address our suggestions in this consultation, instead favouring optimism that if operators are afforded the ability to negotiate, everything will resolve itself. It will not, and we therefore urge Ofcom to re-examine the proposals we put forward for the Assignment Stage.

### 3.3 3.6 GHz lot size

We note the debate between Ofcom and BT on whether lot sizes for the 3.6 GHz auction should be 5 MHz or 10 MHz, and can see the arguments for both.

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Therefore, Vodafone believes that there are compelling arguments for usage of 10 MHz lots, ✂.

This said, we do acknowledge that whilst there is no realistic use case for a single 5 MHz licence, at the margins there could be a case for e.g. 25 MHz bandwidth, particularly if the bidder wished to use a non-standard frame structure hence needed guardbands. If Ofcom is concerned about ruling out this scenario, then as an alternative we would propose a 5 MHz lot size, but combined with a minimum bid. This would ensure that a mischievous bidder could not price drive by repeatedly bidding on a single lot, while still allowing the flexibility that 5 MHz lots facilitate. We do not consider that this would cause any complications to auction design – all that would be needed is for bids for quantities of lots smaller than the minimum size to be discarded. Note that our proposal is a minimum volume of lots on which a bidder may *place bids*, rather than a *minimum number of winning bids*: as such, if the minimum bid rule was four lots and a bidder placed bids on four but was awarded Standing High Bidder status on only three, they would be permitted to maintain these bids and potentially win only 15 MHz.

Vodafone's preference is for a minimum bid of four lots, but we acknowledge that two or three would be alternatives.

### 3.4 3.6 GHz reserve prices

We note that that reserve price for 3.6 GHz has been set in the range of £15-25M per lot, which contrasts with the reserve price of £1M used in the 2018 auction, and £37.5M yielded in that auction. Vodafone considers that the proposal is somewhat high – although the reserve price may turn out to be below the market value that would emerge during bidding, there is also a possibility that it is not, hence the spectrum would go unsold. 3.4 GHz spectrum was the first to be made available for 5G, and was essential for mobile operators to launch 5G services. In contrast, the 3.6 GHz band is to be used to augment this capability – there is no guarantee that the marginal value that bidders will place on this spectrum will be as high as 2/3 of the level for the “baseline” spectrum, as is suggested by these values.

The role of reserve pricing is to mitigate concerns about tacit collusion leading to strategic demand reduction to secure spectrum at an abnormally low price, and to ensure that the revenues yielded from the award are sufficient to cover any clearance costs. In the case of 700 MHz these clearance costs are significant, but in the case of 3.6 GHz, clearance has been at limited cost overall, and at no cost to the taxpayer (as it's been borne by the former licensees, including Vodafone's satellite business). As such, we



find it difficult to understand why a reserve price of £1M was acceptable for similar spectrum less than two years ago, but Ofcom is now proposing to set a reserve price that is 2500% higher – the opportunities for tacit collusion are unchanged, and clearance costs are arguably lower.

Setting a reserve price at the levels suggested undoubtedly risks interfering with price discovery in early rounds of the auction.

Further, setting reserve prices at the level suggested will impose a need for deposits that could discourage truthful bidding. Consider the case that £25M is determined as the reserve price. A bidder then wishing to speculatively bid for the whole available 120 MHz in the opening round of the Principal Stage would need to pay Ofcom some £600M deposit in order to secure sufficient Eligibility Points to place the bid. This is not an outlandish scenario – in the auction of 3.4 GHz, every participant bid for at least 80 MHz of spectrum and the excess demand was some 140 MHz (i.e. initial demand was 193% of supply). If the same bidding pattern were to be exhibited in this award, Ofcom would be holding almost £1.2Bn of deposits (equivalent to the GDP of The Seychelles) associated with demand for the 3.6 GHz band alone<sup>10</sup>, much of which would subsequently need to be returned to the bidders.

This extreme level of upfront deposit is likely to cause issues for participants in obtaining approval, particularly if the auction spans a bidder's financial year. The only rationale that Vodafone can see is that having such a high reserve price would constrain the number of Primary Stage bidding rounds, but, as the previous auction showed, price increases can be set in such a way that they increase rapidly if there is a low reserve price, and that these price increases are moderated as demand decreases – as such the length of the auction would not be materially impacted. We urge Ofcom to consider reserve pricing lower than is currently suggested, to avoid impeding price discovery.

## 4. Missing jigsaw pieces

Vodafone had envisaged the current consultation being more all-encompassing, tying up the loose ends associated with the award. As the consultation focuses narrowly on the auction design, we seek clarification on a series of issues:

- **Mitigation of Digital Terrestrial Television (DTT) interference.** We seek confirmation on whether winning bidders will be expected to fund/organise an interference mitigation scheme, whether the appointment of DMSL would meet Ofcom's expectations, whether such a requirement will apply to all 700 MHz spectrum winners or narrowly just those with paired spectrum, and whether Ofcom accepts that a cap be put on the level of funding expected to be provided for such a scheme.

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<sup>10</sup> A repeat of the 3.4 GHz demand profile would suggest first round bids for 235 MHz of 3.6 GHz, which at £25M/5 MHz leads to £1.17Bn deposits being required.



- **Usage of the centre gap for DTT on a temporary basis.** We seek confirmation of whether this is still a live requirement, and if so the envisaged process for holders of centre gap licences to bring the spectrum into usage.
- **Technical conditions.** We seek confirmation of the technical conditions proposed in the December 2018 consultation. We note that there is a slight discrepancy between the language used for transmitted power in the 700 MHz and 3.6 GHz bands, and question whether this is intentional:
  - 700 MHz – 64dBm/5 MHz EIRP per antenna<sup>11</sup>
  - 3.6 GHz – 65dBm/5 MHz EIRP per cell<sup>12</sup>
- **Auction timing.** We understand that Ofcom cannot provide full certainty on the auction timing given this consultation process, and the interaction with finalising the Shared Rural Network initiative. Nevertheless, as we describe in Section 3.4, the current proposals mean that bidders will be required to provide very substantial deposits at commencement of the Principal Stage. ✂ We therefore ask that Ofcom clarifies its intended auction timing, ✂
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Vodafone UK  
December 2019

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<sup>11</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0014/130730/Annexes-19-26-licences-and-licence-procedures.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0014/130730/Annexes-19-26-licences-and-licence-procedures.pdf) page 38

<sup>12</sup> Ibid, page 50