



Commission for
Communications Regulation

Response to Information Notice 16/16 and decision concerning Three Ireland (Hutchison) Limited's request for amendments to its 2100 MHz licences

Response and Decision

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1 Introduction and background

1. In February 2016, the Commission for Communications Regulation (“ComReg”) published Information Notice 16/16 regarding a request from Three Ireland (Hutchison) Limited (“3IHL”) for amendments to its 2100 MHz licences (the “Requested Amendments”) (“Document 16/16”).

1.1 Background – 3IHL’s 2100 MHz licences and other 2100 MHz licensees

2. 3IHL holds two licences granted under the Wireless Telegraphy (Third Generation and GSM Licence) Regulations, 2002 (as amended by the Wireless Telegraphy (Third Generation and GSM Licence) (Amendment) Regulations, 2003) (together the “3G Licensing Regulations”) for spectrum rights in the 2100MHz band where, among other things:¹
 - 3IHL’s 2100 MHz licence expiring on 24 July 2022 consists of 15 MHz of Frequency Division Duplex (“FDD”) spectrum (1920 - 1935 MHz (mobile transmit) paired with 2110 – 2125 MHz (base station transmit)), and contains a coverage obligation of 85% outdoor demographic coverage; and
 - 3IHL’s 2100 MHz licence expiring on 1 October 2022 consists of 15 MHz of FDD spectrum (1965 - 1980 MHz (mobile transmit) paired with 2155 – 2170 MHz (base station transmit)) and 5 MHz of Time Division Duplex (“TDD”) spectrum (1910 – 1915 MHz), and contains a coverage obligation of 90.2% outdoor demographic coverage.²
3. These licences are referred to by 3IHL as the “A Licence” and “B Licence”³ respectively. In this document ComReg refers to these licences using the same nomenclature.
4. There are 2 other licence holders for spectrum rights in the 2100 MHz band, being Vodafone Ireland Limited (“Vodafone”) and Meteor Mobile Communications Limited (“Meteor”), each of which hold rights to 15 MHz of paired FDD spectrum.

¹ See M3G1006 (<http://www.comreg.ie/csv/downloads/M3G1006.pdf>) and M3G1007 (<http://www.comreg.ie/csv/downloads/M3G1007.pdf>).

² See ComReg Document 07/108.

³ See ComReg Document 01/96 <http://www.comreg.ie/fileupload/publications/odtr0196.pdf>.

1.2 Background - the Requested Amendments

5. Full details of the Requested Amendments, the stated context, and views and other material provided by 3IHL in support of same are set out in Annex 1 of Document 16/16 and interested parties are referred to same.
6. In summary, 3IHL requests that ComReg modify each of the A Licence and B Licence so as to “interchange block 2 for block 11”, which would allow coverage to be provided for both licences using blocks 1, 2 and 3 from a single radio base station (“RBS”) on any site. This is illustrated in Figure 1 below⁴.

Three ‘A’ Licence		Meteor Licence		Vodafone Licence		Three ‘B’ Licence	
Block 1	1920 – 1925 MHz / 2110 – 2115 MHz	Block 4	1935 – 1940 MHz / 2125 – 2130 MHz	Block 7	1950 – 1955 MHz / 2140 – 2145 MHz	Block 10	1965 – 1970 MHz / 2155 – 2160 MHz
Block 2	1925 – 1930 MHz / 2115 – 2120 MHz	Block 5	1940 – 1945 MHz / 2130 – 2135 MHz	Block 8	1955 – 1960 MHz / 2145 – 2150 MHz	Block 11	1970 – 1975 MHz / 2160 – 2165 MHz
Block 3	1930 – 1935 MHz / 2120 – 2125 MHz	Block 6	1945 – 1950 MHz / 2135 – 2140 MHz	Block 9	1960 – 1965 MHz / 2150 – 2155 MHz	Block 12	1975 – 1980 MHz / 2165 – 2170 MHz

Current FDD 3G Spectrum Assignments

Three ‘A’ Licence		Meteor Licence		Vodafone Licence		Three ‘B’ Licence	
Block 1	1920 – 1925 MHz / 2110 – 2115 MHz	Block 4	1935 – 1940 MHz / 2125 – 2130 MHz	Block 7	1950 – 1955 MHz / 2140 – 2145 MHz	Block 10	1965 – 1970 MHz / 2155 – 2160 MHz
Block 11	1970 – 1975 MHz / 2160 – 2165 MHz	Block 5	1940 – 1945 MHz / 2130 – 2135 MHz	Block 8	1955 – 1960 MHz / 2145 – 2150 MHz	Block 2	1925 – 1930 MHz / 2115 – 2120 MHz
Block 3	1930 – 1935 MHz / 2120 – 2125 MHz	Block 6	1945 – 1950 MHz / 2135 – 2140 MHz	Block 9	1960 – 1965 MHz / 2150 – 2155 MHz	Block 12	1975 – 1980 MHz / 2165 – 2170 MHz

Requested FDD 3G Spectrum Assignments

Figure 1: 3IHL’s current and requested 2100 MHz FDD spectrum assignments

7. In its request, 3IHL also submitted that:
 - all other aspects of the 2100 MHz licences, including all obligations and commitments would remain unchanged⁵;

⁴ See <http://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/mobile-licences/> for full details of 3IHL’s 2100 MHz spectrum holdings.

⁵ 3G licence conditions can be viewed at <http://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/mobile-licences/>

- as the blocks the subject of the Requested Amendments are the centre blocks of A Licence and B Licence, the interchange of these blocks will not have any impact on, or have a risk of interference to, other licensees;
- it commits to meeting all licence commitments in the A and B Licences unaffected by the proposed swap of frequency;
- each of 3IHL's respective licences retains the same amount of spectrum assigned; and
- the interchange would not impact 3IHL meeting its commitments to and requirements of the European Commission ("EC") under the terms of the EC's approval of the acquisition by Hutchison 3G UK Holdings Limited of Telefónica Ireland Limited (the "Merger") ("the Commitments").⁶

1.3 Background – statutory framework

8. By way of background to the relevant statutory framework informing ComReg's consideration of this matter, readers are referred to the recent summary of same published by ComReg in Annex 2 of Document 16/57.⁷
9. In this regard, ComReg would highlight:
 - its function of the management of the radio frequency spectrum (Section 10 of the Communications Regulation Act, 2002 (as amended) ("2002 Act"));

⁶ In summary, Hutchison committed to:

- offering to Eircom Limited ("Eircom") to continue the existing network share agreement (between Meteor Mobile Communications Limited ("Meteor") and Telefónica Ireland Limited) on improved terms;
- providing wholesale access to Three's network to two mobile virtual network operators (MVNOs) on the basis of "capacity agreements" in return for fixed payments; and
- offering to one of the two MVNOs (but not both) the option to acquire certain spectrum rights of use to enable one or the other to become a mobile network operator (MNO). These spectrum rights are:
 - 2 x 5 MHz of 900 MHz spectrum in Time Slice 2 (13 July 2015 to 12 July 2030);
 - 2 x 10 MHz of 1800 MHz spectrum in Time Slice 2 (13 July 2015 to 12 July 2030); and
 - 2 x 10 MHz of 2100 MHz spectrum for the remainder of the licence period until 24 July 2022.

The option will be available for 10 years starting from 1 January 2016.

Commitments available at:

http://ec.europa.eu/competition/mergers/cases/additional_data/m6992_4894_3.pdf.

⁷ ComReg Document 16/57 available at: http://www.comreg.ie/?dln_download=response-to-consultation-decision-on-proposed-3-6-ghz-band-spectrum-award.

- its objectives as set out in Section 12 of the 2002 Act and Regulation 16(1) of the of the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (“Framework Regulations”) including:
 - to promote competition⁸; and
 - to ensure the efficient management and use of the radio frequency spectrum in accordance with Ministerial Policy Directions issued under Section 13 of the 2002 Act;
- the regulatory principles which it is obliged to apply in pursuit of the objectives set out in Regulation 16(2) of the Framework Regulations, including:
 - ensuring that, in similar circumstances, there is no discrimination in the treatment of undertakings providing electronic communications networks (“ECN”) and services (“ECS”);
 - safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure based competition;
 - promoting efficient investment and innovation in new and enhanced infrastructures;
- its obligation to ensure that radio frequencies are efficiently and effectively used having regard to Section 12(2)(a) of the 2002 Act and Regulations 16(1) and 17(1) of the Framework Regulations (Regulation 9(1) of the European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2011 (“Authorisation Regulations”));
- its obligation to ensure that, in carrying out its functions, measures taken by it are proportionate having regard to its objectives set out in Section 12 of the 2002 Act (Section 12(3) of the 2002 Act));

⁸ Including by way of: ensuring that users, including disabled users, derive maximum benefits in terms of choice, price and quality; ensuring that there is no distortion or restriction of competition in the electronic communications sector; and encouraging efficient use and ensuring the effective management of radio frequencies.

- its power to amend the rights, conditions and procedures concerning rights of use for radio frequencies, in objectively justified cases and in a proportionate manner (Regulation 15 of the Authorisation Regulations)⁹;
- Regulation 6(4) of the 3G Licensing Regulations¹⁰; and
- its obligation to monitor and supervise compliance with the conditions of rights of use of radio frequencies (Regulation 16 of the Authorisation Regulations).

1.4 Background – summary of ComReg’s preliminary assessment in Document 16/16

10. In summary, ComReg stated that, based on the information provided by 3IHL and other information available to it at that time, it was of the preliminary view that the Requested Amendments would be appropriate in the context of ComReg’s statutory framework (including being objectively justified and proportionate in the context of Regulation 15 of the Authorisation Regulations).¹¹ Factors identified by ComReg in this regard included that the Requested Amendments would, in summary:

- accord with ComReg’s objective to promote competition because, among other things:
 - they would be unlikely to result in a distortion or restriction of competition to the detriment of users;
 - they would facilitate 3IHL’s radio access network (“RAN”) refresh and subsequent roll-out programme in an efficient manner, the outcome of which should contribute to users deriving maximum benefit in terms of choice, price and quality;

⁹ Regulation 15(4) provides that, except where the proposed amendment is minor in nature and have been agreed with the holder of a right of use for radio frequencies, ComReg is obliged to give notice, in such manner as it considers appropriate, of its intention to make the amendment and invite interested parties, including users and consumers, to make representations on the proposed amendment within such period as may be specified in the notice but not being less than 28 days from the date of the notice except in exceptional circumstances.

¹⁰ Which provides that, without prejudice to paragraph 1 of that Regulation, at the request of the Licensee, ComReg may, if it considers appropriate to do so, amend a 2100 MHz licence by adding to, deleting from or altering the radio frequency spectrum specified in such a licence on which the apparatus may be used.

¹¹ ComReg also noted that, in light of the fact that the Requested Amendments would not involve amendments to the obligations, commitments or overall quantum of spectrum assigned, it did not believe it necessary to conduct a regulatory impact assessment in present circumstances. ComReg further noted that the potential implications of the Requested Amendments on industry stakeholders, competition and consumers were considered in the context of relevant aspects of ComReg’s statutory framework. ComReg remains of the view that this approach is appropriate.

- encourage the efficient use of the radio spectrum by facilitating the conduct of 3IHL's RAN refresh and subsequent roll out programme in a more efficient manner. In particular, by ensuring all licence obligations are met, avoiding inefficient investment costs and any subsequent technical inefficiencies identified by 3IHL;
 - accord with the relevant regulatory principles which ComReg is obliged to apply in pursuit of its objectives. In particular the Requested Amendments would:
 - promote efficient investment and innovation in new and enhanced infrastructures by facilitating Three's network refresh and rollout programme in an efficient manner by permitting it to avoid what would otherwise be inefficient investment costs;
 - not give rise to discrimination in the treatment of undertakings providing ECN and ECS; and
 - accord with the principle of safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based competition
 - be proportionate; and
 - be without prejudice to ComReg's obligation to monitor and supervise compliance by 3IHL with the obligations of the A and B Licences.
11. ComReg also proposed that a condition of any approval of the Requested Amendments be that 3IHL expressly agree to such amendments of each of the A and B Licences as required to enable the timely divestment of 2 x 10 MHz of contiguous 2100 MHz spectrum in the A Licence as envisaged under the Commitments. ComReg also stated, for the avoidance of doubt, that 3IHL would bear all costs in relation the implementation of any such amendments.
12. Finally, ComReg stated that it was minded to approve the Requested Amendments subject to the condition identified above.

2 Submissions received to Document 16/16 and ComReg's assessment of same

13. One interested party, Vodafone, submitted a response to Document 16/16.
14. No comments were received from Meteor (being the other licensee in the 2100 MHz band), Virgin Media Communications Ireland Ltd (previously UPC Communications Ireland Ltd) ("Virgin Media") or Carphone Warehouse Ltd, which also trades under the brand "iD" ("Carphone Warehouse"), the latter two being the two Mobile Virtual Network Operators ("MVNOs") facilitated by and relevant to the Commitments.
15. Following the publication of Vodafone's submission¹², ComReg invited views from 3IHL with respect to same. ComReg's invitation and the non-confidential version of 3IHL's response of 12 April 2016 are contained in Annex 1 to this document.
16. In addition, and following further consideration of the technical aspects of 3IHL's submissions, ComReg issued a request for further information to 3IHL in response to which 3IHL submitted further technical information to ComReg on 8 August. Non-confidential versions of this correspondence are contained in Annex 2 to this document.
17. In general terms, Vodafone states that it is concerned by the Requested Amendments and makes various submissions in this regard. Vodafone's submissions are summarised and addressed by ComReg in the context of the following broad categories of issues:
 - submissions regarding 3IHL's licence commitments/conditions;
 - submissions regarding the technical justification for the Requested Amendments;
 - submissions regarding spectrum efficiency;
 - Vodafone's submissions in relation to competition, efficient infrastructure investment and non-discrimination;

¹² See ComReg Document 16/16s - Submission received to Information Notice 16/16: <http://www.comreg.ie/fileupload/publications/ComReg1616s.pdf> .

- submissions relating to the Commitments; and
- Vodafone's suggested remedy in light of its stated concerns.

18. In its response, 3IHL generally submits that:

“The Vodafone document submitted to ComReg seems to be based on a number of remarkable misunderstandings which blatantly misrepresent the change requested by Three. It puts forward a number of incorrect statements, and repeatedly attempts to build from this a reason why ComReg should not agree to the channel swap. None of these statements withstands minor scrutiny. These arguments have been put forward in a mischievous manner in order to confuse and delay ComReg’s decision.”

19. 3IHL's specific submissions in support of this general view, including the further technical information provided on 8 August, are also summarised and considered by ComReg in the context of the above-mentioned broad categories of issues.

2.1 Submissions regarding 3IHL's 2100 MHz licence conditions

Background

20. In Document 16/16, ComReg relevantly stated that:

- whilst the Requested Amendments would interchange the centre blocks in the A Licence and B Licence, it would not affect the conditions and commitments relating to these licences;
- the Requested Amendments would be proportionate because, among other things, the Requested Amendments would not involve any change to the conditions and commitments to the licences involved; and
- furthermore, the Requested Amendments are without prejudice to ComReg's obligation to monitor and supervise compliance by 3IHL with the obligations of the A and B Licences. ComReg notes, in this regard, 3IHL's commitment to meeting all licence commitments in the A and B Licences is unaffected by the proposed swap of frequency assignments.

Views of respondents

21. In summary, Vodafone relevantly submits that:

- i. the Proposed Amendments would allow 3IHL to not comply with the commitments made in the 3G licence and to keep a fifteen MHz block of frequencies without any coverage commitment whatsoever;
- ii. by allowing 3IHL to use twice the spectrum assignment of 2100 MHz of other operators at a new lower set of coverage commitments ComReg would be actively favouring one operator and discriminating against other operators;
- iii. the Proposed Amendments would allow 3IHL to build a lower capacity network in lower density areas than committed to in the 3G licence assignment process. In Vodafone's view this would reduce the ability of new MVNO to establish market share in rural areas, limiting their ability to move to being an MNO. Further, Vodafone submits that the consolidation of network sites that 3IHL discuss is a natural outcome of their merger and therefore does not need ComReg to approve this proposal;
- iv. 3IHL's coverage commitments in the 3G licensing process and the due diligence process it conducted with the acquisition of O2 mean that it has been aware of its licence commitments and entered into agreements in full knowledge of the investment costs involved in holding both A and B licences. The conditions were integral parts of winning the spectrum in a competitive beauty contest. The licence commitments of any one operator should not be changed to give them a competitive cost advantage; and
- v. there does not appear to be any legal basis for ComReg to vary the licence terms of one licence holder in a competitive market, without reviewing all the licence conditions for all 2100 MHz spectrum band licences.

22. In summary, 3IHL submits that:

- vi. Vodafone's response refers to the conditions attached to the licences themselves and implies that the channel swap requested would change the licence commitments (*"licence commitments should not be changed to give them a competitive advantage"* – 3IHL's reference). In fact, no change to licence conditions is proposed, and this should be apparent to Vodafone from reading ComReg's Information Notice. 3IHL further submits that it is noteworthy that, despite the claims built upon this premise, not a single licence condition change has been referenced by Vodafone;

- vii. the Requested Amendments would enable 3IHL to decommission the existing Ericsson RBS apparatus deployed on the “B” licence while maintaining coverage for both licences as well as minimising customer disruption during the upgrade process. Vodafone’s subsequent comments relating to this point are irrelevant to the subject at hand.

ComReg’s assessment

23. In relation to points (i) and (ii), ComReg would respond as follows.
24. First, ComReg reiterates that the Requested Amendments do not involve any change to the conditions and commitments relating to the A and B Licences – only an interchange in the specific frequency locations of the centre blocks of said licences.¹³ In particular, the respective coverage obligations that currently apply to the A and B Licences would continue to apply after any giving effect to the Requested Amendments. In that regard, ComReg observes that Vodafone has not identified any specific change to the conditions or commitments in support of its various claims. ComReg further observes 3IHL’s submission in this regard.
25. In any event, ComReg has considered the various relevant licence conditions of the A and B Licences (in particular, Schedule 5 – Parts 4 and 5) and observes that these obligations and commitments do not make reference to, or otherwise rely upon in terms of compliance with same, the specific locations of the blocks in either licence or the number of blocks¹⁴ in same. In particular, these obligations rely upon the notion of “coverage” identified in Schedule 4 – Part 4 which is defined by reference to coverage around base station sites (and, further, the area served by one or more dedicated set of antenna/transceivers at each site)¹⁵.

¹³ Which, given the centre location of these blocks, should not raise any interference issues with neighbouring licensees.

¹⁴ Noting, however, that at least 1 block in each Licence would need to be activated in order to comply with the relevant quality of service uplink and downlink requirements.

¹⁵ Where coverage in this part is defined as follows:

Definition of Coverage

Radio coverage is established from base station sites. Coverage around a site is accomplished using one (omni-directional) or several sectors. A sector is served by dedicated antenna/transceivers.

Coverage is defined in terms of a minimum bearer data rate for UDD packet transmission of 144 kbps.

The sector coverage area is the area served by one dedicated set of antenna/transceivers.

The site coverage area is the total area covered from the base station equipment located at that site (i.e. the sum of sector coverage areas).

26. Therefore, the flexibility afforded to 3IHL under the current terms of its A and B Licences (such as in relation to the precise spectrum block/s and the quantum of spectrum blocks deployed)¹⁶ remains unchanged in either the current or proposed scenarios.
27. In addition, ComReg is not aware of any particular harm arising from whether any unused spectrum blocks are split between two spectrum assignments as opposed to being in a contiguous block.
28. Finally, ComReg also notes:
- 3IHL's commitment to meeting all licence commitments in the A and B Licences;
 - ComReg's position in Document 16/16 that the Requested Amendments are without prejudice to ComReg's obligation to monitor and supervise compliance by 3IHL with the obligations of the A and B Licences (Regulation 16 of Authorisation Regulations); and
 - in relation to Vodafone's claim of discrimination against other operators, that Vodafone's arguments do not address ComReg's view on the issue of non-discrimination as set out in Document 16/16. See also section 2.4 of this document.
29. In relation to point (iii):
- ComReg is not aware of commitment/s in the 3G licence assignment process of the kind referred to by Vodafone in the first sentence of point (ii) (i.e. commitments specifically obliging a particular quantum of capacity on the Licensee's network¹⁷);
 - given the above, ComReg considers that the conclusion drawn by Vodafone in the second sentence of point (iii) appears to be without foundation. ComReg also refers to section 2.5 of this document for its

ComReg further observes that this definition also applies in respect of Vodafone's 2100 MHz licence.

¹⁶ And, indeed, to the other 2100 MHz licensees under the terms of their respective licences. In this regard, ComReg observes that the decision of 3G licensees to deploy more than 1 spectrum block in a 3G licence has generally been decided on a site-by-site basis depending on the capacity constraints at that site. Further, ComReg notes that each of the 3G Licensees has previously had its compliance with its 3G licence coverage obligations assessed on the basis of coverage from one activated spectrum block in the licence.

¹⁷ Whilst there are some references to the Licensee's network capacity (i.e. in the context of the Licensee's MVNO obligations), these obligations apply to the MVNO and, therefore, are not relevant in the current context.

final views regarding the Proposed Amendments in the context of the EC's Merger Commitments; and

- ComReg agrees that 3IHL's consolidation of network sites appears to be a natural outcome of the Merger and does not, in general terms, require any approval from ComReg. Clearly, however, ComReg's approval is required where the consolidation would involve an amendment to the rights, conditions and/or procedures of 3IHL's rights of use of frequencies (as it does in the present case in respect of the proposed swap of the centre blocks of the A and B Licences).
30. In relation to point (iv), ComReg firstly notes the first two sentences. In relation to the third sentence, ComReg reiterates that no licence conditions or commitments would be changed as a consequence of the Proposed Amendments (only the location of the centre blocks in the A and B Licences).¹⁸
31. In relation to point (v), ComReg observes that the regulatory framework does not identify any such requirement. In any event, and is clear from Document 16/16 and the relevant sections of this document, ComReg has carefully considered the Requested Amendments in the context of its relevant statutory functions, objectives, regulatory principles, powers and duties, including whether the Requested Amendments may result in a distortion or restriction of competition to the detriment of users, or give rise to discrimination in the treatment of undertakings providing ECN and ECS. See section 2.4 for ComReg's assessment of Vodafone's submissions in this regard.

2.2 Submissions regarding the technical requirement for the Requested Amendments

Background

32. In section 2.1 of Document 16/16 ComReg noted the following submissions from 3IHL relating to the context and technical requirement for the Requested Amendments:
- following the acquisition of O2 Telefonica and ComReg's multi-band spectrum award in 2012, 3IHL is currently in the process of a major network refresh and subsequent roll-out programme which will entail the replacement of legacy GSM and 3G Radio Access Networks ("RAN"s)

¹⁸ ComReg also notes 3IHL's submission in this regard.

with a single integrated solution across all of its Liberalised Use and 3G spectrum holdings¹⁹;

- this refresh and roll-out programme consists of:
 - the continuing roll-out of LTE/4G technology, to provide fast data service to the retail customers of both Three and its MVNOs²⁰;
 - optimising the provision of voice and data services using different technologies and frequency bands;
 - enhancing 3G coverage by increased RAN density with more sites²¹ in the 2100 MHz band, and further rollout of 3G on the 900 MHz band; and
 - providing improved service to all users for both voice and data and in particular, bringing an improvement in the 3G service to rural and western areas²²;
- when the RAN refresh programme is completed, it proposes to generally use spectrum blocks 1, 2 and 3 for coverage and blocks 10, 11 and 12 for capacity. Furthermore, 3IHL's intent is that the population coverage provided using the spectrum rights of use under both the A and B licences will exceed the higher coverage obligation of the B licence²³;
- in designing the process for the on-site replacement of the 2100 MHz RAN, an issue arises because the spectrum rights operated by 3IHL are not contiguous, but at opposite ends of the band;
- the span in total for both assignments is 60 MHz and the radio base stations (RBS) currently being deployed by 3IHL do not have the capability to span this bandwidth in a single RBS; and

¹⁹ This is assumed to mean the spectrum holdings of Three. See <http://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/mobile-licences/> for details of spectrum holdings.

²⁰ The MVNOs (ID Mobile and Virgin Mobile) relate to the Commitments given to the EU as part of the merger process.

²¹ Combining the base station locations from both legacy networks of 3ISHL [confidential] sites and 3IHL [confidential] sites, noting that some of which would be shared sites. Following the RAN refresh, three's intention is that a new joint RAN will operate from [confidential] sites.

²² 3IHL further state that following this programme and by Q1/2017, population coverage will be: for 2G service at [confidential], for 3G services as [confidential] and for 4G services at [confidential].

²³ 3IHL notes that:

- the decision regarding which technology, which band, and how many channels should be deployed at each location needs to be determined on a site-by-site basis and is determined by a combination of customer demand, overall network requirements, and local site considerations;
- not all sites will use both coverage and capacity blocks in the 2100 MHz band, noting that 3G service will be provided on 900 MHz and that LTE/4G and GSM service is also being provided.

- without the Requested Amendments, 3IHL would need to install (or maintain) two 2100 MHz RBS on each 3G coverage site, including those where this is not required for capacity, and this could:
 - require additional investment which would not be required for any other reason, and as such would be an inefficient investment; and
 - cause specific technical inefficiencies on certain sites, where additional active and passive equipment would need to be provided and combined into antennas, which would reduce the site effectiveness in certain circumstances.

Views of respondents

33. In summary, Vodafone submits that:
- i. from a technical perspective equipment is available that can cover the band covering both 3IHL licences;
 - ii. from published articles, it understands that Nokia are 3IHL's 3G equipment suppliers; and
 - iii. the Nokia equipment specifications for the 2100MHz band, which Vodafone attaches to its submission, state that the Transmit and Receive frequency capability cover the whole range that includes both 3IHL 2100 MHz licences. In appendix 1 to Vodafone's submission, it submits technical specifications for the Nokia Flexi Remote Radio Head 2TX 2100 (FRGY).
34. In its April submission in summary, 3IHL:
- iv. submits that it would repeat that the RBS currently in use by it does not have the capability to span the 60MHz bandwidth in a single RBS (which is the primary reason for making the request to ComReg in the first place). Specifically 3IHL identifies the Nokia model FRGT as the 2100 MHz macro RBS transmitter equipment installed by Three up to 12 April 2012. In relation to this equipment 3IHL submits that
 - *“while this RBS equipment is capable of operating at any frequency within the 2100MHz band, it has an operational span of 30 MHz, so it is not capable of operating on two channels, the centre frequency of which are separated by more than 25 MHz.”;*
 - *“In the case of the two spectrum assignments included in Three's licences, the centre frequency separation spans between 35MHz at the minimum to 45MHz at maximum, so the installed base of FRGT*

RBS is not capable of providing a service on spectrum from both the “A” and “B” licences at the same time.”

- v. states that: *“From June 2016 Three will be able to deploy the Nokia Macro RBS model FRGU. On sites where this model RBS will be deployed, it is capable of spanning the full 60MHz of the 2100MHz band, however a network software upgrade is required to enable the deployment of this newer variant of Nokia RBS equipment. 3IHL adds that:*
- *it “would expect to be in a position to deploy this RBS on some sites from June on, following the successful implementation of the software upgrade” and*
 - *“This equipment was not available when Three’s access network upgrade programme commenced in mid-2015.; and*
 - *“Its availability, however, does not eliminate the requirement to carry out the channel swap”.*
- vi. submits there are a number of complicating factors surrounding the planned network upgrade that make it necessary to interchange the centre channel in each licence. While Three did not explicitly list these complicating factors, Three states that:
- *“Three does not propose to deploy all six 2100MHz channels on all sites – only the sites that require higher capacity will utilise the full six channels. These tend to be busy urban sites, where only a relatively small coverage area is provided per site.*
 - *“In sites were [sic] it is not necessary to use more than 3 channels, Three plans to use contiguous lots rather than mixing channels from both ends of the band because it is a more sensitive and efficient configuration. This is important for rural sites where any reduction in sensitivity shrinks coverage. For this type of rural site, Three will continue to deploy the FRGT RBS in most cases.”*
 - *“the channel swap also facilitates the timely implementation of the upgrade in a situation where the two separate networks are being integrated.”*
 - *“it is not possible in any area for the new Nokia RBS and the old Ericsson RBS to operate on the same spectrum simultaneously without causing interference. Three’s preference is to introduce upgraded equipment on channels 1, 2, and 3, and to optimise service on these channels first. When this is complete, the Ericsson RBS on*

channels 10, 11, and 12 will cease operation for the entire upgrade area, and only then are these channels available for use on the Nokia RBS. This minimises customer disruption during the upgrade process. While this process is underway in any upgrade area, it is necessary to maintain coverage for both licences using channels 1, 2, and 3.”

- *“At this time, [confidential] sites have been upgraded and [confidential] sites remain to be completed. The sites which have already been upgraded are using Nokia’s FRGT RBS and operate only on channels 1, 2, and 3. Depending on local circumstances, in some cases, the Ericsson RBS in the same area has already been decommissioned, however in some cases they continue to operate. It is Three’s intention to decommission the Ericsson RBS network entirely during the upgrade. In areas where the Nokia FRGT RBS has already been installed, it will not be possible to operate on spectrum in channels 1, 2, 3, and 10, 11, 12 without again replacing the RBS.*
- *“The upgrade completed so far is mostly in rural areas, where the six channels are not required for capacity reasons. Absent the licensing requirement to operate on spectrum in both parts of the band, there would be no technological reason to do so. Without the channel swap, Three will be required to remove the existing FRGT RBS and replace it with a FRGU RBS in a significant number of these sites. This would decrease coverage from those sites on a permanent basis, would cause unnecessary service disruption while the change is again carried out, and would cause unnecessary cost.”*
- *“Changing the RBS requires a hardware installation on each site, and would delay the completion of Three’s network upgrade by approximately another year with adverse consequences for both the consumer and competition (from Three and the MVNO’s that it hosts).”*

35. 3IHL’s submission of August 2016 provides additional information on the technical capabilities of the Nokia equipment installed on each site and the technical capabilities of the Nokia equipment planned but not yet deployed. In summary, 3IHL:

- vii. clarifies that there are 9 different variants of radio frequency (RF) unit in operation, and that these vary in age and capability.
- viii. clarifies the technical capabilities of each RBS variant, submitting that:

- none of the units deployed prior to the FRGT are capable of spanning more than 20MHz;
 - the FRGT equipment discussed in point (iv) above has a standard operational bandwidth of 40MHz rather than the 30MHz as specified in previous correspondence. 3IHL adds that the FRGT can be made to span 60MHz with a software upgrade (which 3IHL has applied), but that this comes at the cost of reduced overall performance; and
 - the newer equipment FRGU and FRGY is capable of spanning 60 MHz.
- ix. provides information on its currently installed base of Nokia equipment and clarifies that from its [confidential] site records:
- some sites have multiple RBS variants deployed
 - [confidential] sites have RBS equipment which is limited to a span of 20MHz or less;
 - [confidential] sites have FRGT equipment deployed; and
 - the newer equipment FRGU and FRGY is not deployed on any sites.
- x. resubmits its proposal in light of the complicating factors discussed in point (vi) above, namely that the broader bandwidth units will only be installed on sites where more than 3 channels is required. 3IHL adds that:
- some of the older units prior to the FRGT will be not be replaced, as 3IHL would not use the RF equipment with the broadest bandwidth universally, as there are trade-offs in performance; and
 - given reduced overall performance issues, 3IHL will only use the FRGT on sites where it has up to three contiguous carriers, and it will use FRGU for the higher capacity sites.

ComReg's assessment

36. In relation to points (ii) and (iii), ComReg would respond as follows:
- while Vodafone understands that Nokia is the equipment supplier for 3IHL, the RBS referenced in the Vodafone submission, the Nokia Flexi Remote Radio Head 2TX 2100 (FRGY), is not the apparatus deployed by 3IHL;

- the Nokia model FRGY is not a direct substitute for the RBS equipment used by 3IHL, as from the technical specifications ComReg observes that the Nokia FRGY is:
 - a remote radio head; and
 - two sector only, intended for pole or building mounting to provide capacity increases or coverage improvements in a localised area²⁴;
37. In relation to point (i), ComReg agrees that from a technical perspective there is equipment available that is capable of spanning the entire 60 MHz of the 2100 MHz band in a single RBS. Indeed 3IHL indicates that the FRGT, and FRGU equipment has this capability.
38. In relation to this broader bandwidth equipment, ComReg observes that:
- the availability of this equipment does not change the current situation of deployed RBSs where 3IHL's submission of August 2016 indicates that [confidential] sites have RBS equipment which is limited to a span of 20MHz or less, and [confidential] sites have FRGT equipment deployed; and
 - the deployment of this broader bandwidth equipment has performance trade-offs that degrade radio performance affecting coverage. For example, ComReg observes that the output power of the FRGT equipment decreases with the downlink bandwidth deployed²⁵.

²⁴ Such as, shopping or business districts in areas of high population or building density.

²⁵

http://proectron.ru/NSN/Docs/Flexi_Multiradio_BTS_RF_Module_Description/r106338321/r106338321.html

39. In relation to the complicating factors surrounding 3IHL's planned network upgrade project as discussed in point (vi), ComReg firstly observes that the motivation behind this project is the replacement of legacy RAN equipment with a single integrated solution from Nokia²⁶ across all of 3IHL's Liberalised Use and 3G spectrum holdings. Legacy Ericsson²⁷ RAN equipment is deployed on the B Licence. 3IHL's intention is to decommission the Ericsson RBS network in its entirety during the upgrade and 3IHL state that "it is not possible in any area for the new Nokia RBS and the old Ericsson RBS to operate on the same spectrum simultaneously without causing interference".
40. While ComReg observes that it is technically possible for an operator to use both Nokia and Ericsson RAN equipment together, ComReg:
- agrees with 3IHL that this simultaneous operation of Nokia RBS and Ericsson RBS on the same spectrum in any area would result in an increased risk of intermodulation interference from the use of additional network elements such as combiners and feeders used in integrating the RAN. Such a scenario would likely have a negative impact on consumer experience and effectively lead to reduced coverage.
41. ComReg further notes that the use of RAN equipment from two manufacturers:
- would not be normal practice for a mobile network operator, given difficulties such as the technical challenges associated with operating equipment with potentially different manufacturer settings; and
 - would be a less efficient choice for an operator given network element losses typically incurred from combiners and feeders, which would necessitate the use of greater power output from the transmitter to avoid a reduction in coverage²⁸.

²⁶ "Nokia and 3IHL sign 5-year contract to upgrade RAN operations", Cellular-News, 27th May 2016
<http://www.cellular-news.com/story/Operators/68840.php>

"Nokia wins 3 Ireland managed services deal", Global Telecoms Business, 17 May 2016,
<http://www.globaltelecomsbusiness.com/article/3554937/Nokia-wins-3-Ireland-managed-services-deal.html#.V5jqfWeFPak>

²⁷ Ericsson RBS 3000 and 6000 family of base stations.

²⁸ It is further noted that the increased risk of intermodulation interference with such a power increase could also reduce the service radii of the cell by desensitising the receive side of the RBS; something that would likely impact on all operators at shared sites

42. Given the above, ComReg is of the view that the replacement of legacy RAN equipment with a single integrated solution, in this case from Nokia, is an appropriate action for 3IHL to pursue, as among other things, this supports the efficient use of spectrum.
43. To facilitate this single integrated solution, ComReg observes that there are two options in relation to the Requested Amendments, namely:
 - Option 1: Refuse the Requested Amendments; and
 - Option 2: Allow the Requested Amendments.
44. ComReg's consideration of these options is set out below in relation to technical information provided by 3IHL.

Option 1: Refuse the Requested Amendments

45. Under this option, 3IHL indicates that [confidential] sites where 3IHL is of the view that it is not necessary to use more than 3 channels for capacity reasons²⁹, 3IHL would be required to operate in both parts of the 2100 MHz band using the Nokia FRGU³⁰.
46. Under this option, ComReg observes that:
 - additional costs would be incurred by 3IHL in replacing existing RBS for sites where such replacement is not required for capacity purposes. In this regard, ComReg observes 3IHL's view that:
 - absent a licensing requirement to operate on both parts of the 2100 MHz band, there would be no technological reason to do so for sites where more than 3 channels is not required for capacity purposes.;
 - the [confidential] sites already upgraded to FRGT as per April 2016 are mostly in rural areas where six channels are not required for capacity purposes and
 - that some sites with older RBS variants deployed prior to the FRGT would not need to be replaced as there are trade-offs in performance;

²⁹ 3IHL indicate that the higher capacity sites which will use the full six channels tend to be the busy urban areas where only a relatively small coverage area is provided per site.

³⁰ While 3IHL's submission of August 2016 clarifies that the FRGT is capable of spanning 60MHz, noting the cost in overall performance with this use], ComReg observes that 3IHL maintains its view that in the long run 3IHL will only use FRGT on sites where it has up to 3IHLcontiguous carriers, and it will use FRGU for the higher capacity sites.

- competition and the benefits to consumers may not be maximised for sites where the deployment of FRGU is not required for capacity purposes. ComReg observes 3IHL's views that:
 - the coverage of cells with the Nokia FRGU would be reduced compared to the Nokia FRGT, and this this would result in the coverage of these sites being reduced on a permanent basis. In this regard, ComReg observes that additional costs may be incurred by 3IHL should it decide to address any reduced coverage issues due to the deployment of FRGU;
 - consumer service disruption would be incurred while the RBS replacement is being carried out replacing for sites where such replacement is not required for capacity purposes; and
 - as changing the RBS requires a hardware installation the additional RBS replacement would delay the completion of network upgrade by approximately another year with consequences for consumers and competition; and
- this would reduce the efficient use of spectrum as operating in both parts of the 2100 MHz band where this is not required would unnecessarily increase both the noise floor and the risk of interference for 3IHL. ComReg further notes that other collocated operators in the 2100 MHz band could also be affected by an increase interference desensitising RBS receivers.

Option 2: Allow the Requested Amendments

47. Under this option, 3IHL indicates that it would only deploy the FRGU for the higher capacity sites, which 3IHL indicates to be sites in busy urban areas where only a relatively small coverage area is provided per site.
48. Under this option, ComReg observes that:
- additional costs would not be incurred by 3IHL in replacing existing RBS for sites where such replacement is not required for capacity purposes;
 - competition and the benefits to consumers would not be hindered. In this regard ComReg observes that:
 - the approximately 1 year additional delay associated with Option 1 would be avoided;
 - the reduced coverage of the FRGU, compared to the FRGT, is unlikely to adversely impact consumers, as 3IHL indicates that the sites

- should a site require extra capacity in the future, 3IHL can take actions at that time to address this matter. Further ComReg observes that the consumer demand for capacity at sites can also be fulfilled with other spectrum rights licensed to 3IHL. Currently 3IHL also has spectrum rights in the 800 MHz, 900 MHz and 1800 MHz bands.
- this would not reduce the efficient use of spectrum as operating in both parts of the 2100 MHz band where this is not required would be avoided. This would avoid unnecessary increases in both the noise floor and the risk of interference for 3IHL, and avoid the risk of increased interference desensitising RBS receivers to other collocated operators in the 2100 MHz band.

49. From the above, it is clear that Option 2 is the preferred option.

2.3 Submissions regarding spectrum efficiency

Background

50. At paragraph 25 of Document 16/16, ComReg stated that it was of the preliminary view that the Requested Amendments would encourage the efficient use of the radio spectrum by:
- facilitating the conduct of 3IHL's RAN refresh and subsequent roll out programme in a more efficient manner; and
 - in particular, by ensuring all licence obligations are met, avoiding inefficient investment costs and any subsequent technical inefficiencies identified by 3IHL.

Views of respondents

51. In summary, Vodafone submits that:
- i. it started legal proceedings against ComReg on the basis that it had not reviewed the efficiency of the spectrum post the Merger transaction, and it was assured ComReg had conducted a review and spectrum was efficiently assigned³¹;

³¹ Vodafone also submits "For the avoidance of doubt ComReg have maintained to date that spectrum is efficiently and effectively managed currently as ComReg are not aware of any spectrum controlled by H3GI that is not being used and also on the basis that both H3GI and 02 Ireland are compliant with their roll-out and coverage obligations in relation to spectrum licenses."

- ii. if ComReg approved this proposal it would, in Vodafone's view, be contradicting views it expressed on spectrum efficiency which were raised in the context of the recent legal challenge Vodafone made to ComReg's views on spectrum management following the outcome of the Three/O2 transaction³²; and
- iii. 3IHL's proposal does not result in the more efficient use of spectrum; rather, in Vodafone's view, it facilitates the rollout of network to less people and a reduction in cost for 3IHL.

52. In summary, 3IHL submits that:

- iv. it is surprised to see Vodafone refer in this matter to its abandoned High Court proceedings against ComReg challenging ComReg's operation of its spectrum management function. In its view the only relevance those proceedings bear for this matter is to highlight that one should be wary about the use of unsound claims regarding spectrum management and licensing to stultify ComReg in carrying out its statutory functions;
- v. the request to ComReg to swap a channel from each licence is a technical matter which would facilitate its current network integration and upgrade programme, and would, in its view, benefit customers and competition. Rather than disadvantaging customers in low density areas, it would allow it to provide coverage to even more rural areas, by eliminating the requirement to use two radio base stations where this is not necessary or replace recently installed equipment. 3IHL further submits that network investment by it would not be reduced as a result of the change, rather it would allow the network to spread further, providing more customer benefit.

ComReg's assessment

53. In relation to point (i) concerning the judicial review proceedings referred to by Vodafone [2104/595/JR], ComReg refers to its position as set out in Information Notice 15/56.³³

³² In particular, Vodafone submits:

"Now we read this change would 'encourage the efficient use of the radio spectrum'. How can ComReg justify a view that stated initially that efficiency is measured through the active use of spectrum assigned but now says that there is a scale of efficiency is depending on operators' investments?"

³³ComReg Document 15/56 http://www.comreg.ie/fileupload/publications/ComReg_1556.pdf .

54. In relation to point (ii), Vodafone will recall that, at around the time the judicial review proceedings were instituted, ComReg relevantly observed that “[e]ach of Hutchison and O2 Ireland continues to hold its own spectrum rights of use and operate as separate legal entities. The merged entity can only now set out using its assets with purpose given that the uncertainty with regard to merger approval has only recently been removed”.³⁴ (emphasis added)
55. In that context, ComReg observes that the Requested Amendments are stated by 3IHL as forming part of its major network refresh and subsequent roll-out programme which entails the replacement of legacy GSM and 3G RANs with a single integrated solution across its Liberalised Use and 3G spectrum holdings. (emphasis added)
56. In light of the above, ComReg does not consider Vodafone to be correct given, among other things, that:
- Vodafone seeks to compare ComReg’s views on spectrum efficiency in two different factual situations being:
 - firstly, in the context of the judicial review proceedings, a situation where the merger entities held their own spectrum rights of use and operated as separate legal entities and, importantly, 3IHL had not made known to ComReg its views on the potential issues arising from the integration of the two networks³⁵; and
 - secondly, ComReg’s current views in the context of where 3IHL has identified the integration issues it faces and ComReg is, therefore, now in a position to consider the spectrum efficiency issues that would arise with and without the Requested Amendments. That is, Vodafone’s arguments ignore the potential for 3IHL to make efficient use of the relevant spectrum rights in the context of an integrated network;
 - Vodafone does not address ComReg’s view in Document 16/16 that the Requested Amendments would encourage the efficient use of the radio spectrum by, among other things, avoiding the technical inefficiencies identified by 3IHL³⁶; and

³⁴ ComReg letter to Vodafone of 14 October 2014. See Information Notice 15/56.

³⁵ Noting that 3IHL’s amendment request is dated 5 October 2015 – being almost a year after Vodafone instituted its judicial review proceedings.

- 3IHL's more recent submissions on the technical justification for the Requested Amendments (as summarised and assessed in section 2.2 above) support the view that the Requested Amendments are reasonable.

57. In addition, ComReg:

- observes that it has put in place a regulatory regime to ensure and incentivise efficient spectrum use. In particular, various specific *ex-ante* measures to ensure on-going efficient use of spectrum in the relevant bands (in particular, coverage and roll-out obligations and the payment of upfront spectrum access fees and ongoing spectrum usage fees); and
- notes that it continues to monitor and supervise compliance by all of the MNOs with the conditions attached to their respective licences, including the *ex-ante* measures identified above. In that regard, ComReg would refer to, among other things:
 - its drive tests carried out in mid-2015 and winter 2015 details of which are available in ComReg Documents 15/142R1 and 16/27 respectively. In both cases, ComReg found that "*all networks measured were found to be compliant with the licence conditions in force.*" (para 10);
 - the fact that Liberalised Use Licensees are up-to-date for their respective spectrum usage fees; and
 - that it continues to regularly meet with the MNOs to discuss relevant matters such as market trends, deployment of new technologies, coverage levels etc.

58. In relation to point (iii) regarding Vodafone's view that the Requested Amendments would facilitate the rollout of the network to less people, ComReg notes the following:

- Vodafone firstly provides no analysis, evidence or other material to support this claim;
- 3IHL claims that 3G services are being enhanced by the use of more sites in the 2100 MHz band, and also the rollout of services on the 900MHz band;
- the technical assessment of the Requested Amendments (in section 2.2 above) where ComReg observes that not permitting the Requested Amendments would result in reduced coverage on a permanent basis in

the rural sites where the Nokia RBS model FRGT is replaced by the Nokia RBS model FRGU for purely licensing reasons

59. For these reasons ComReg considers it unlikely that the Requested Amendments would facilitate the rollout of the network to less people. On the contrary, and as noted in Document 16/16 the Requested Amendments would likely facilitate 3IHL's RAN refresh and subsequent roll-out programme in an efficient manner, the outcome of which should contribute to users deriving maximum benefits in terms of choice, price and quality. In its submission of 12 April 2016, 3IHL further indicates that rather than disadvantaging customers in low density areas, the Requested Amendments will allow 3IHL to provide coverage to even more rural areas, by eliminating the requirement to use two radio base stations where this is not necessary or replace recently installed equipment.
60. In relation to Vodafone's claims in relation to 3IHL's costs, ComReg refers to its analysis of these issues in the following section.

2.4 Submissions regarding competition, efficient infrastructure investment, non-discrimination and proportionality

Background

61. In Document 16/16, ComReg relevantly stated that the Requested Amendments would accord with the objective to promote competition because, among other things:
- they would facilitate 3IHL's RAN refresh and subsequent roll-out programme in an efficient manner, the outcome of which should contribute to users deriving maximum benefits in terms of choice, price and quality;
 - they would be unlikely to result in a distortion or restriction of competition to the detriment of users because:
 - following the acquisition of Telefónica Ireland Limited, 3IHL is entitled to enjoy the economic benefits of common ownership of 6 blocks of

2100 MHz spectrum rights (albeit held under 2 separate 2100 licences)³⁷;

- the Requested Amendments would not increase the amount of 2100 MHz spectrum rights to which 3IHL is entitled;
- whilst the Requested Amendments would interchange the centre blocks in the A Licence and B Licence, it would not affect the conditions and commitments relating to these licences meaning that there would remain 3 blocks subject to the existing conditions of the A Licence and 3 blocks subject to the existing conditions of the B Licence;
- as the blocks that are the subject of the Requested Amendments are the centre blocks of the A Licence and B Licence, the interchange of these blocks should not have any impact on adjacent 2100 MHz licensees; and
- the avoidance of inefficient investment costs by 3IHL should not distort or restrict competition to the detriment of consumers generally.

62. Further, in Document 16/16, ComReg observed that the Requested Amendments:

- would not give rise to discrimination in the treatment of undertakings providing ECN and ECS because, whilst 3IHL, Vodafone and Meteor are all 2100 MHz licensees and competing MNOs, the situation of 3IHL is materially different from the other MNOs. In particular, it is the only MNO with two sets of spectrum rights in the 2100 MHz band, at the opposite ends of the band, and which faces the possibility of incurring inefficient infrastructure investment and technical difficulties associated with same;
- would accord with the principle of safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based

³⁷ In that regard, ComReg recalls that the EC, in its competition analysis of the Proposed Acquisition, considered that the change in spectrum holdings resulting from same is “unlikely to have anticompetitive effects”. In particular, the EC’s full decision relevantly states (at section 7.6.2.2 - page 163):

“The Commission considers that the change in spectrum holdings resulting from the merger is unlikely to have anticompetitive effects. The merger will not reduce the spectrum holdings of Eircom and Vodafone and, hence, it will not have any impact on the network quality and speed offered by Eircom and Vodafone. The fact that, after the merger, there will be a spectrum asymmetry is not, as such, anticompetitive. In this respect, the Commission points out that, at present, each of Vodafone and Eircom have more spectrum than Three. This has not, however, prevented 3IHL from competing effectively in the Irish retail market.”

- competition for the reasons identified above (in relation to distortion and restriction of competition);
- would be proportionate because, among other things:
 - the objective of the Requested Amendments (i.e. facilitating 3IHL's RAN refresh and subsequent rollout programme in a manner which would avoid inefficient investment costs and technical inefficiencies) would accord with ComReg's statutory objectives and regulatory principles as described above;
 - there do not appear to be less onerous means by which these objectives and principles could be achieved;
 - the Requested Amendments would not involve any change to the conditions and commitments to the licences involved; and
 - are without prejudice to ComReg's obligation to monitor and supervise compliance by 3IHL with the obligations of the A and B Licences. ComReg notes, in this regard, 3IHL's commitment to meet all licence conditions in the A and B Licences is unaffected by the proposed swap of frequency assignments.

Views of respondents

63. In summary, Vodafone submits that:
- i. ComReg assigned the spectrum with conditions, and it should not be ComReg's role to intervene in the market with the sole attempt to lower the costs of one operator;
 - ii. it is not ComReg's role to consider or attempt to intervene in investment decisions of operators. The level of investment following spectrum assignments is a matter for the operators and efficient investment is only a matter for ComReg in terms of total market considerations, not to benefit one operator;
 - iii. by approving this decision ComReg is effectively giving one operator a cost advantage. Three acquired the spectrum rights of use in an open transparent way and was aware of the need for investment, roll out etc;
 - iv. the Requested Amendments would give a competitive advantage to Three and distort competition in the market in so far as ComReg would act to change obligations unilaterally and help lower the investment costs of an operator;

- v. this cost saving for Three should not be seen by ComReg as a gain for users. As per Regulation 16(2) ComReg should promote infrastructure based competition. It is Vodafone's view that this decision will distort competition; and
- vi. by allowing Three to use twice the spectrum assignment of 2100 of other operators at a new lower set of coverage commitments ComReg is actively favouring one operator and discriminating against other operators.

ComReg's assessment

- 64. First, in relation to Vodafone's reference to the conditions under which the A and B Licences were issued in point (i), to "chang[ing] obligations unilaterally" in point (iv) and "a new lower set of coverage commitments" in point (vi), ComReg refers to its analysis in section 2.1 of this document.
- 65. Second, in relation to Vodafone's references to "lower[ing] the costs of one operator", and "intervene[ing] in investment decisions of operators", ComReg:
 - firstly, acknowledges that the Requested Amendments would permit 3IHL to avoid additional, inefficient investment costs for 3IHL that would otherwise be incurred in replacing existing RBS for sites where such replacement is not required for capacity purposes;
 - but nevertheless considers that allowing 3IHL to avoid these investment costs (i.e as identified in "Option 1" in section 2.2) is, among other things, objectively justified in the context of ComReg's statutory framework. In particular, ComReg considers that:
 - it would accord with and further ComReg's obligation/objective of promoting/ensuring the efficient use of spectrum for the reasons identified in section 2.2; and
 - it would accord with and further the regulatory principle of promoting efficient investment and innovation in new and enhanced infrastructure by allowing 3IHL to avoid what would otherwise be inefficient infrastructure investment.

66. Third, in relation to Vodafone's view that "...efficient investment is only a matter for ComReg in terms of total market considerations and not to benefit one operator", ComReg is of the view that Vodafone is mistaken. In particular, given that total market investment is made up of the sum of individual investments, the extent to which any individual operator(s) are limited in investing more efficiently can clearly be relevant to any assessment made by ComReg.³⁸ Further, ComReg observes that the relevant regulatory principle (i.e. Regulation 16(2)(d) of the Framework Regulations) refers to "permitting various cooperative arrangements between investors and parties seeking to diversify the risk of investment while ensuring that competition in the market and the principle of non-discrimination are preserved". In ComReg's view, this clearly evidences the ability of an NRA to consider and, if appropriate, permit arrangements that would affect the investments of individual operators. Further, ComReg observes that an NRAs assessment of actual/potential collaboration arrangements (e.g network sharing) involves consideration of, among other things, the potential benefits of such agreements in terms of permitting more efficient investment (and the extent to which such benefits would be passed onto consumers) against any potential negative impacts on competition.
67. Fourth, in relation to Vodafone's reference to the promotion of infrastructure-based competition, ComReg firstly observes that 3IHL is, clearly, an infrastructure-based competitor in the relevant markets concerned. Further, ComReg considers that the Requested Amendments would accord with and further this regulatory principle by allowing 3IHL to avoid what would otherwise be inefficient infrastructure investments (and the additional negative effects identified in section 2.2) and, thereby, be a more efficient infrastructure-based competitor relative to the scenario where the Requested Amendments were not approved (i.e. the counterfactual).

³⁸ This approach can also be seen in relation to ComReg's obligation/objective of ensuring the efficient use of spectrum. In particular, whilst ComReg has an obligation/objective to ensure the efficient use of spectrum in overall terms (and implements appropriate measures in this context (such as efficient/effective spectrum *allocation* decisions and adopting the most appropriate spectrum *assignment/award* procedures to ensure efficient use of one or more bands), it also implements measures aimed at ensuring efficient use of spectrum at an individual licensee level (e.g imposing and monitoring the compliance with various obligations such as the payment of upfront and ongoing spectrum fees, coverage and roll-out obligations etc).

68. Fifth, in relation to Vodafone's claims of a "cost advantage", a "competitive advantage", discrimination against other competitors and a distortion to competition arising from the Proposed Amendments, ComReg firstly observes that there are 2 different but inter-related issues to be considered being:
- whether or not the Requested Amendments (and the avoidance of inefficient infrastructure investment by 3IHL in particular) result in a cost advantage or a competitive advantage for 3IHL relative to the remaining 2100 MHz licensees. ComReg further observes that the obligation of non-discriminatory treatment of undertakings providing ECN/ECS is a relevant consideration in this regard; and
 - if so, would any competitive advantage arising from the Requested Amendments result in a distortion or restriction of competition to the detriment of consumers (or would not otherwise accord with the overall objective of the promotion of competition or would not safeguard competition to the benefit of consumers).
69. In relation to the first issue, ComReg notes that:
- the Requested Amendments would permit 3IHL to avoid certain (inefficient) investment costs that would otherwise be required if the Requested Amendments were not approved; and
 - 3IHL and the remaining 2100 MHz licensees are competing MNOs in the relevant markets concerned.
70. That being said, ComReg does not believe that the Requested Amendments would provide 3IHL with a cost advantage. In particular, 3IHL would avoid inefficiently occurred costs that do not need to be considered by other operators (including Vodafone). These costs only arise as 3IHL is the only MNO with two sets of spectrum rights in the 2100 MHz band, at the opposite ends of the band. Therefore, no cost advantage materialises relative to any other operator as the basis on which such costs arise are materially different;

71. As a result, and in relation to the second issue, the Requested Amendments do not confer a competitive advantage on 3IHL that might lead to the detriment of consumers. The Requested Amendments do not provide for the more favourable treatment (e.g a benefit) to 3IHL relative to the other 2100 MHz licensees. In other words, ComReg does not consider that the Requested Amendments entail ComReg providing a particular benefit to 3IHL in circumstances where (a) the other 2100 MHz licensees would also be in the same or similar position to potentially enjoy that benefit and (b) but are not being permitted to by ComReg.
72. In that regard, ComReg recalls its preliminary views on non-discrimination in Document 16/16³⁹ and, further, observes that while Vodafone claims that ComReg is "...actively favouring one operator and discriminating against other operators" it does not address the matters raised by ComReg in respect of non-discrimination in Document 16/16. Furthermore, ComReg also observes that while the Requested Amendments would result in lower costs for 3IHL relative to the counterfactual, this would be obtained through the efficient reduction of costs that are already available to the other 2100 MHz licensees (because they each have apparatus which can span their entire respective 2100 MHz frequency assignments). For these reasons, ComReg does not agree with Vodafone that the Requested Amendments would:
- provide 3IHL with a cost *advantage* or a competitive *advantage*; or
 - result in discrimination in the treatment of undertakings providing ECN/ECS.

³⁹ That is:

"the Requested Amendments would not give rise to discrimination in the treatment of undertakings providing ECN and ECS because, whilst 3IHL, Vodafone and Meteor are all 2100 MHz licensees and competing MNOs, the situation of 3IHL is materially different from the other MNOs. In particular, it is the only MNO with two sets of spectrum rights in the 2100 MHz band, at the opposite ends of the band, and which faces the possibility of incurring inefficient infrastructure investment and technical difficulties associated with same."

73. In relation to the second issue, ComReg firstly recalls its analysis of same in Document 16/16 (including as summarised above) and notes Vodafone's claim that the Requested Amendments would "...distort competition in the market in so far as ComReg would act to change obligations unilaterally and help lower the investment costs of an operator". In that regard, and as addressed in section 2.1 of this document, the Requested Amendments do not involve a change to the licence conditions or commitments of the A and/or B Licences.⁴⁰ Therefore, the first limb of Vodafone's claim is without foundation. In relation to the second limb, ComReg observes that Vodafone does not identify, in specific or general terms, how 3IHL's "lower investment costs" would distort or restrict competition, including:

- in particular, whether and, if so, how it would affect Vodafone's and/or Meteor's ability to effectively compete with 3IHL in the relevant markets concerned; and
- whether any such effects on these operators' ability to effectively compete would be to the detriment of these competitors' respective consumers or consumers more generally.

⁴⁰ Moreover, and as identified by ComReg in Document 16/16:

- the Requested Amendments would not increase the amount of 2100 MHz spectrum rights to which 3IHL is entitled; and
- as the blocks that are the subject of the Requested Amendments are the centre blocks of the A Licence and B Licence, the interchange of these blocks should not have any impact on adjacent 2100 MHz licensees; and
- the Requested Amendments are without prejudice to ComReg's obligation to monitor and supervise compliance by 3IHL with the obligations of the A and B Licences. ComReg noted, in this regard, 3IHL's commitment to meet all licence conditions in the A and B Licences is unaffected by the proposed swap of frequency assignments.

74. In any event, ComReg does not, on balance, believe that the Requested Amendments, by permitting 3IHL to avoid what would otherwise be inefficient investments, is likely to materially distort or restrict competition to the detriment of consumers where, among other things, Vodafone and Meteor already enjoy the efficiency and other benefits of having apparatus that can span the entirety of their respective 2100 MHz spectrum assignments. Moreover, ComReg finds it difficult to believe that Vodafone's and/or Meteor's ability to effectively compete against 3IHL would be materially dependent upon 3IHL incurring inefficient infrastructure investments in respect of [confidential] sites. More generally, ComReg does not believe that the overall objective of the promotion of competition, including the safeguarding of competition to the benefits of users, is furthered or promoted by obliging an undertaking to make inefficient infrastructure investments (and the associated technical/user disadvantages) where an appropriate regulatory measure would be available to address same – particularly where the Regulatory Framework encourages NRAs to promote efficient investment in appropriate circumstances.

2.5 European Commission's Merger Commitments

Background

75. In Document 16/16, ComReg relevantly stated that in relation to the Commitments, it:
- firstly notes 3IHL's submission that the interchange *would "...in no way impact on it meeting its commitments to/ requirements of the EC under the approval of the Proposed Acquisition."*;
 - recalls that the 2100 MHz divestment spectrum identified in the Commitments relates to 2 x 10 MHz of 2100 MHz spectrum in the A Licence;
 - observes that the Requested Amendments would result in the spectrum blocks in the A Licence no longer being contiguous; and
 - observes that for spectrum efficiency reasons the "Upfront MVNO" or "Second MVNO" seeking to exercise the "Spectrum Option" (terms as defined in the Commitments) may wish to have two blocks of contiguous 2100 MHz spectrum in the A Licence.
76. In light of the above, ComReg proposed that a pre-condition of any approval of the Requested Amendments would be that 3IHL expressly agree to:

- such amendments of each of the A and B Licences as required to enable the timely divestment of 2 x 10 MHz of contiguous 2100 MHz spectrum in the A Licence as envisaged under the Commitments;
- carry out the implementation of such amendments within the 6 month period identified in the Commitments (see paragraph 17 of same); and
- bear all costs in relation the implementation of such amendments.

Views of respondents

77. In summary, Vodafone submits that:

- i. it has *previously* raised with ComReg “*that the merger of Three Ireland and O2 left the merged company with a spectrum assignment considerably in excess of that of the other operators in Ireland. At the insistence of the EU Commission this imbalance was mitigated by Commitments that allowed new MVNO access to network capacity in the post-merger Three network, and established that the new MVNO should have an option to move to being an MNO through the acquisition of spectrum from Three*”⁴¹;
- ii. its concerns are twofold. Firstly it contends that “*ComReg are [sic] undermining the commitments by not allowing 2 contiguous blocks of 2100 spectrum to be readily available to a new entrant. This seriously undermines the effectiveness of the commitment and the attractiveness of the spectrum available.*”;
- iii. Vodafone similarly submits that “[*t*]*he change proposed, if adopted by ComReg, would unilaterally change commitments agreed with the European commission as part of the clearance of the Three/O2 transaction*” and “*ComReg are also proposing to amend the outcome of the EU Merger decision - again contradicting their previous position that they did not have a roll [sic] in this process. This change to the Merger outcome surely is a matter for the EU Commission and the mechanism put in place to monitor to compliance with the commitments post conditional clearance must be reviewed by DG Competition.*”;
- iv. “*This proposed amendment will allow Three to build a lower capacity network in lower density areas than committed to in the 3G licence assignment process which would reduce the ability of new MVNO to*

⁴¹ Vodafone also submits that the Commitments were comprehensive and designed to encourage the creation of network competition in the mobile market. The spectrum was not assigned to a new entrant at the time of the transaction but the clear intention of the EU Commission was that spectrum would be identified for a network operator and 3IHL would facilitate the transfer of spectrum.

establish market share in rural areas, limiting their ability to move to being an MNO”;

- v. *“ComReg are attempting to address this [i.e. which ComReg understands to mean the issue of contiguity] through a change to [C]ommitments they had no involvement in and could not enforce if any such amendment was challenged. ComReg do not have the legal basis to change the commitments and should instead put these conditions into a regulation which would be open to consultation.”⁴²; and*
- vi. *“Vodafone are concerned that ComReg’s changes are not legally enforceable against Three and therefore the commitments are fatally undermined and the intention of the conditions imposed are undermined. Given the importance of the commitments Vodafone would have expected the views of the Commission to be included and the Commitments altered by the EU Commission, not ComReg. Vodafone considers this issue to be a serious interference in the role of the EU Commission in this transaction and reserves its rights to take whatever action it thinks appropriate to protect its interests.”*

78. In its response, 3IHL submits that:

- vii. *“The channel swap requested in no way affects or alters the [C]ommitments given to the European Commission relating to the acquisition of Telefonica Ireland Limited by the Hutchison Group. Under the merger [C]ommitments, Three committed to make two lots (2x(2x5MHz)) of spectrum from the 2100MHz band available to either Virgin Media or iD [Carphone Warehouse], if they chose to exercise that option. This commitment remains unchanged and Three remains fully capable of fulfilling this commitment if and when the option is exercised”;*
- viii. *“All of the claims made by Vodafone consequent to this misunderstanding are null and void”;*
- ix. *“It is mischievous and completely incorrect of Vodafone to state that ComReg is “proposing to amend the outcome of the EU Merger decision”. It is noticeable that the beneficiaries of that commitment*

⁴² Vodafone also submits that:

“ComReg’s changes are not legally enforceable against 3IHL and therefore the commitments are fatally undermined and the intention of the conditions imposed are undermined. Given the importance of the commitments Vodafone would have expected the views of the Commission to be included and the Commitments altered by the EU Commission, not ComReg. Vodafone considers this issue to be a serious interference in the role of the EU Commission in this transaction and reserves its rights to take whatever action it thinks appropriate to protect its interests.”

(Virgin Media and iD) have not raised any objections to the proposed swap”; and

- x. *“For the record, the European Commission did not accept that there was a spectrum imbalance as a result of the merger requiring an appropriate remedy or commitment. This is clear from the European Commission’s decision approving the acquisition and has been pointed out to Vodafone on a number of occasions.”*

ComReg’s assessment

79. In relation to points numbered (i) and (x), ComReg firstly recalls that the “spectrum imbalance” to which Vodafone refers arose as a result of the Merger and the EC specifically considered that issue and found that it was unlikely to have anticompetitive effects.⁴³ ComReg is also aware of the EC’s stated basis for the spectrum-related aspect of the Commitments (or “MNO Commitment”).⁴⁴

⁴³ The EC’s Full Decision considered the issue of “Spectrum imbalance after the merger” at section 7.6.2.2 (page 163). In particular the following comments of the EC are noted:

“(687) In submissions to the Commission, [...] has argued that the spectrum asymmetry resulting from the merger would give the merged entity an insurmountable advantage, especially for LTE services. [...] has made similar submission to the Commission and argues that the merged entity’s spectrum advantage would make other MNOs unable to constrain the merged entity.

(688) The Commission considers that the change in spectrum holdings resulting from the merger is unlikely to have anticompetitive effects. The merger will not reduce the spectrum holdings of Eircom and Vodafone and, hence, it will not have any impact on the network quality and speed offered by Eircom and Vodafone. The fact that, after the merger, there will be a spectrum asymmetry is not, as such, anticompetitive. In this respect, the Commission points out that, at present, each of Vodafone and Eircom have more spectrum than Three. This has not, however, prevented 3IHL from competing effectively in the Irish retail market.”

⁴⁴ See, in particular, section 9.6.1.2 of the EC’s Full Decision for a description of the MNO Commitment and paragraphs 999 to 1006 for the EC’s discussion of same. Notably, there are no references by the EC to the “spectrum imbalance” issue addressed by it in section 7.6.2.2 in its subsequent discussion of the MNO Commitments.

80. In relation to points (ii) and (vii), ComReg observes that the Divestment Spectrum is defined in the Commitments to relevantly include 2 x 10 MHz of 2100 MHz spectrum for the remainder of the licence period until 24 July 2024 (i.e. 2 x 10 MHz from the A Licence), but the Commitments are silent on whether these two blocks are required to be contiguous. Accordingly, the Requested Amendments would not alter the Commitments in this regard as claimed by Vodafone. That being said, ComReg clearly recognises, in the context of its spectrum management function, objectives and duties (such as in relation to the efficient use of the radio spectrum), the desirability of contiguous spectrum assignments, including 2 x 10 MHz in the A Licence being divested as a contiguous assignment. It is for this reason that it proposed the pre-condition in Document 16/16.
81. In relation to point (iv), ComReg refers to its analysis of this point in section 2.1 above.
82. Finally, in relation to the ability of a new MVNO to establish market share in rural areas, ComReg notes that the commitment to enter into a capacity agreement with the MVNOs is provided for on a national basis across the entire 3IHL Network. Therefore, the extent to which 3IHL could limit either MVNO is limited, given that such a strategy would equally affect 3IHL's ability to capture market share in the same areas. ComReg does not, on balance, consider such a strategy to be realistic. ComReg also notes that it has not received any comments from either the upfront MVNO (Virgin) or the second MVNO (CarPhone Warehouse) in relation to the concerns expressed by Vodafone.
83. In relation to Vodafone's remaining points, ComReg would respond as follows:
- the Requested Amendments would entail a change in the location of the centre block of the A Licence, which would be given effect to by way of the exercise of, relevantly, ComReg's power to amend the rights, conditions and procedures concerning rights of use for radio frequencies (Regulation 15 of the Authorisation Regulations);
 - in relation to this power, and as Vodafone will be aware, the MNO Commitment and the EC's Merger decision generally are "*without prejudice to ComReg's statutory powers, notably those in relation to effective use of spectrum.*"⁴⁵ That is, ComReg is clearly entitled to appropriately exercise its spectrum management powers in relation to the underlying spectrum rights the subject of the MNO Commitment;

⁴⁵ Paragraph 1005 of the EC's Full Decision.

- in the present case, and as stated clearly in Document 16/16 and in this document, the Requested Amendments: do not involve a change in conditions or commitments relating to the A and B Licences, do not entail a change in the quantum of spectrum in these licences etc; and
- the proposed “block swap” would not affect 3IHL’s ability to divest 2 x 10 MHz of spectrum within the A Licence as required under the Commitments (as the Requested Amendments would not change the quantum of spectrum blocks in the A Licence available for divestment). ComReg notes 3IHL’s views in this regard; and
- finally, ComReg again notes that it has not received any comments from either the upfront MVNO (Virgin) or the second MVNO (CarPhone Warehouse) in relation to the concerns expressed by Vodafone.

2.6 Vodafone’s suggested remedy in light of its stated concerns

Views of respondents

84. Vodafone submits that if 3IHL cannot use the spectrum as assigned it should surrender it. Vodafone also suggests that ComReg could then complete a reassignment process where 3IHL could repurchase the correct assignment that suits its needs.

ComReg’s assessment

85. Given the above assessment of Vodafone’s submissions, ComReg does not consider Vodafone’s suggested remedy to be objectively justified or appropriate.

3 ComReg's final position and next steps

86. For the reasons set out in Document 16/16 and as updated and supplemented in this document, and having taken due account of the views and material provided by 3IHL and Vodafone and other material before it, ComReg is satisfied that the Request Amendments are appropriate in the context of ComReg's statutory framework, including being objectively justified and proportionate as required by Regulation 15 of the Authorisation Regulations. Factors informing this conclusion are outlined in summary form below.
87. First, based on the material provided by 3IHL and having considered the views of Vodafone, ComReg considers that the Requested Amendments are technically justified. In particular, they would:
- avoid additional, inefficient investment costs for 3IHL that would otherwise be incurred in replacing existing RBS for sites where such replacement is not required for capacity purposes;
 - promote the efficient use of its 2100 MHz spectrum rights by 3IHL by allowing it to use both parts of the 2100 MHz band where this is required, thereby avoiding:
 - unnecessary increases in both the noise floor and the risk of interference for 3IHL; and
 - the risk of increased interference desensitising RBS receivers to other collocated operators in the 2100 MHz band; and
 - not negatively affect benefits to users of the 3IHL network because:
 - the approximately 1 year additional delay associated with Option 1 would be avoided; and
 - the reduced coverage of the FRGU, compared to the FRGT, is unlikely to adversely consumers, as 3IHL indicates that the sites requiring higher capacity tend to be sites in the busy urban areas where only a relatively small coverage area is provided per site.
88. Second, ComReg considers that the Requested Amendments are suitable for the realisation of several legitimate primary objectives under the Regulatory Framework including:

- ensuring the efficient use of the radio spectrum more generally by facilitating the conduct of 3IHL's RAN refresh and subsequent roll-out programme in an efficient manner, including by:
 - involving the interchange centre blocks of the A Licence and B Licence, meaning that there should not be any impact on adjacent 2100 MHz licensees;
 - ensuring that all licence obligations and relevant commitments are maintained (in particular, the coverage obligations in each of the A and B Licences);
 - avoiding the technical inefficiencies that would otherwise arise if the Requested Amendments were approved;
- the promotion of competition by:
 - facilitating 3IHL's RAN refresh and subsequent roll-out programme in an efficient manner, the outcome of which should contribute to users deriving maximum benefits in terms of choice, price and quality (including 3IHL's users as identified above); and
 - not being likely to result in a distortion or restriction of competition in the electronic communications section because, among other things:
 - the Requested Amendments would not increase the amount of 2100 MHz spectrum rights to which 3IHL is presently entitled;
 - the Requested Amendments would not involve any change to the conditions or commitments attached to the A and B Licences (and contrary to the repeated claims by Vodafone in this regard);
 - the Requested Amendments are without prejudice to ComReg's obligation to monitor and supervise compliance by 3IHL with the conditions and commitments attached to the A and B Licences. ComReg notes, in this regard, 3IHL's commitment to meeting all licence commitments in the A and B Licences is unaffected by the proposed swap of frequency assignments; and
 - Vodafone and Meteor already enjoy the efficiency and other benefits of having radio equipment that can span the entirety of their respective 2100 MHz spectrum assignments.

89. Third, ComReg considers that the Requested Amendments would accord with and further the relevant regulatory principles which ComReg is obliged to apply in pursuit of its objectives. In particular the Requested Amendments:
- would promote efficient investment and innovation in new and enhanced infrastructures by facilitating 3IHL's network refresh and rollout programme in an efficient manner by permitting it to avoid what would otherwise be inefficient investments;
 - would not give rise to discrimination in the treatment of undertakings providing ECN and ECS because, whilst 3IHL, Vodafone and Meteor are all 2100 MHz licensees and competing MNOs, the situation of 3IHL is materially different from the other MNOs. In particular, it is the only MNO with two sets of spectrum rights in the 2100 MHz band, at the opposite ends of the band, and which faces the possibility of incurring inefficient infrastructure investments and technical difficulties associated with same. Put another way, Vodafone and Meteor already enjoy the efficiency and other benefits of having radio equipment that can span the entirety of their respective 2100 MHz spectrum assignments; and
 - would accord with the principle of safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure based competition for the reasons identified above (in relation to distortion and restriction of competition).
90. Fourth, the Requested Amendments are proportionate because, among other things:
- they would be suitable for the achievement of the legitimate objectives and regulatory principles identified;
 - they appear to be the least onerous means by which these objectives and principles could be achieved; and
 - the Requested Amendments will not involve any change to the conditions and commitments attached to the licences concerned.
91. Fifth, ComReg has carefully considered Vodafone's various objections to the Requested Amendments (and 3IHL's views in this connection) and does not find them to be persuasive. In particular and in summary:
- Vodafone's repeated claims that the Requested Amendments would involve a change in the conditions and/or commitments attached to the A and B Licences are, simply, incorrect;

- Vodafone's claims in relation to the technical aspects of the Requested Amendments are also incorrect;
 - Vodafone's claims of contradictory views by ComReg in relation to spectrum efficiency in the context of the previous legal proceedings:
 - seeks to compare ComReg's position on spectrum efficiency in two different factual situations; and
 - ignores the potential for 3IHL to make efficient use of its 2100 MHz spectrum rights in the context of an integrated network;
 - Vodafone's claim that the Requested Amendments would facilitate the rollout of network to less people is not supported by the material before ComReg;
 - Vodafone's claims of a "cost advantage" and/or "competitive advantage" arising from the Requested Amendments do not satisfactorily address the analysis set out by ComReg in the context of non-discrimination (including that 3IHL is a materially different position from the other 2100 MHz licensees and that Vodafone and Meteor already enjoy the efficiency and other benefits of having radio equipment that can span the entirety of their respective 2100 MHz spectrum assignments);
 - Vodafone's concerns in relation to the Commitments are not persuasive because:
 - critically, the Requested Amendments would not involve a change to the Commitments. In particular, they would not affect 3IHL's ability to divest 2 x 10 MHz of spectrum within the A Licence as required under the Commitments (as the Requested Amendments would not change the quantum of spectrum blocks in the A Licence available for divestment); and
 - ComReg has not received any comments from either the upfront MVNO (Virgin) or the second MVNO (CarPhone Warehouse) in relation to the concerns expressed by Vodafone.
92. Sixth, in relation to the Commitments, ComReg remains of the view that its proposed pre-condition of any approval/giving effect to the Requested Amendments is appropriate, objectively justified and proportionate in the context of its statutory framework (and, in particular, ensuring the efficient use of spectrum).

93. Accordingly, ComReg has decided that it will give effect to the Requested Amendments subject to 3IHL first unconditionally agreeing in writing to:
- such amendments of each of the A and B Licences as required to enable the timely divestment of 2 x 10 MHz of contiguous 2100 MHz spectrum in the A Licence as envisaged under the Commitments;
 - carry out the implementation of such amendments within the 6 month period identified in the Commitments (see paragraph 17 of same); and
 - bear all costs in relation the implementation of such amendments.
94. Upon satisfactory receipt of the above, ComReg will issue two amended licences to 3IHL reflecting the revised spectrum assignments as set out in Figure 1 of this document. ComReg, in keeping with its standard practice, will publish the licences on its website with the appropriate redactions.

Annex 1:

Vodafone response to Three Ireland (Hutchison) Limited's request for an amendment to its 2100 MHz licences

Information Notice Reference:
Date:

ComReg 16/16
29/02/2016

Vodafone position

Thank you for the opportunity to comment on this proposed change to licence conditions.

Vodafone are very concerned by this proposed change, which has significant implications for spectrum management and the approach of ComReg to spectrum licence holders.

The change proposed, if adopted by ComReg, would unilaterally change commitments agreed with the European commission as part of the clearance of the Three/O2 transaction. The change would give a competitive advantage to Three and distort competition in the market in so far as ComReg would act to change obligations unilaterally and help lower the investment costs of an operator. Finally, Vodafone would argue that if ComReg approved this proposal they would be contradicting views they expressed on spectrum efficiency which were raised in the context of the recent legal challenge Vodafone made to ComReg's views on spectrum management following the outcome of the Three/O2 transaction.

For the avoidance of doubt ComReg have maintained to date that spectrum is efficiently and effectively managed currently as ComReg are not aware of any spectrum controlled by H3GI that is not being used and also on the basis that both H3GI and O2 Ireland are compliant with their roll-out and coverage obligations in relation to spectrum licenses. The proposed changes will allow Three to not comply with the commitments made in the 3G licence and to keep a fifteen MHz block of frequencies without any coverage commitment whatsoever.

ComReg are also proposing to amend the outcome of the EU Merger decision - again contradicting their previous position that they did not have a roll in this process. This change to the Merger outcome surely is a matter for the EU Commission and the mechanism put in place to monitor to compliance with the commitments post conditional clearance must be reviewed by DG Competition.

Vodafone believe, and would draw on precedent from other occasions when Spectrum which has been assigned and is not used, that Three should surrender this spectrum and the spectrum offered to the market to ensure its reassignment on terms to be set by ComReg. Three won the 'beauty contest' to secure an A license in the 3G competition with transparent terms and conditions which they are now seeking to change. Vodafone would

be keen to compete to gain use of this band in a new competition and to allow an operator to unilaterally reduce its commitments and its investment would undermine the 3G competition and the efficient use of these bands.

Significant change to EU Commission commitments

Vodafone have raised with ComReg previously that the merger of Three Ireland and O2 left the merged company with a spectrum assignment considerably in excess of that of the other operators in Ireland. At the insistence of the EU Commission this imbalance was mitigated by Commitments that allowed new MVNO access to network capacity in the post-merger Three network, and established that the new MVNO should have an option to move to being an MNO through the acquisition of spectrum from Three.

These commitments were comprehensive and designed to encourage the creation of network competition in the mobile market. The spectrum was not assigned to a new entrant at the time of the transaction but the clear intention of the EU Commission was that Spectrum would be identified for a network operator and Three would facilitate the transfer of spectrum.

Vodafone have two major concerns. Firstly, ComReg are undermining the commitments by not allowing 2 contiguous blocks of 2100 spectrum to be readily available to a new entrant. This seriously undermines the effectiveness of the commitment and the attractiveness of the spectrum available. Secondly ComReg are attempting to address this through a change to commitments they had no involvement in and could not enforce if any such amendment was challenged. ComReg do not have the legal basis to change the commitments and should instead put these conditions into a regulation which would be open to consultation.

Vodafone are concerned that ComReg's changes are not legally enforceable against Three and therefore the commitments are fatally undermined and the intention of the conditions imposed are undermined. Given the importance of the commitments Vodafone would have expected the views of the Commission to be included and the Commitments altered by the EU Commission, not ComReg. Vodafone considers this issue to be a serious interference in the role of the EU Commission in this transaction and reserves its rights to take whatever action it thinks appropriate to protect its interests.

Negative change in lower density areas.

This proposed amendment will allow Three to build a lower capacity network in lower density areas than committed to in the 3G licence assignment process :

- this will reduce the ability of new MVNO to establish market share in rural areas, limiting their ability to move to being an MNO.
- The consolidation of network sites that Three discuss is a natural outcome of their merger and therefore does not need ComReg to approve this proposal.

Efficient use of spectrum

Vodafone started legal proceeding against ComReg on the basis that they had not reviewed the efficiency of the spectrum post the Merger transaction. We were assured ComReg had conducted a review and spectrum was efficiently assigned. Now we read this change would 'encourage the efficient use of the radio spectrum'. How can ComReg justify a view that stated initially that efficiency is measured through the active use of spectrum assigned but now says that there is a scale of efficiency is depending on operators' investments?

Three's proposal does not result in the more efficient use of spectrum; on the contrary it facilitates the rollout of network to less people and a reduction in cost for Three. This cost saving for Three should not be seen by ComReg as a gain for users. As per Regulation 16(2) ComReg should promote infrastructure based competition. It is Vodafone's view that this decision will distort competition.

Three's licence commitments

Vodafone believe that Three's coverage commitments in the 3G licensing process and their due diligence process they conducted with the acquisition of O2 mean that they have been aware of their license commitments and entered into agreements in full knowledge of the investment costs involved in holding both A and B licences. The conditions were integral parts of winning the spectrum in a competitive Beauty contest. The licence commitments of any one operator should not be changed to give them a competitive cost advantage. There does not appear to be any legal basis for ComReg to vary the licence terms of one licence holder in a competitive market, without reviewing all the license conditions application for all 2100 spectrum bands.

It is not ComReg's role to consider or attempt to intervene in investment decisions of operators. The level of investment following spectrum assignments is a matter for the operators and efficient investment is only a matter for ComReg in terms of total market considerations, not to benefit one operator

Discrimination

In ComReg's Assessment the regulatory principle in Regulation 16(2) is used as a guiding principle to ensure there is no discrimination. But by allowing Three to use twice the spectrum assignment of 2100 of other operators at a new lower set of coverage commitments Comreg are actively favouring one operator and discriminating against other operators.

By approving this decision ComReg are effectively giving one operator a cost advantage. Three bought the spectrum in an open transparent way and was aware of the need for investment, roll out etc. – ComReg assigned the spectrum with conditions, and it should not be ComReg's role to intervene in the market with the sole attempt to lower the costs of one operator.

Not technically justified

From a technical perspective equipment is available that can cover the band covering both Three licences. A copy of Nokia equipment specifications for the 2100MHz band is attached, (from published articles we understand Nokia are Three's 3G equipment suppliers). These specifications clearly state that the Transmit and Receive frequency capability cover the whole range that includes the both the Three Licences.

Correct way to deal with Spectrum being inefficiently used.

Vodafone believes that if Three cannot use the spectrum as assigned they should surrender the blocks. ComReg can then complete a reassignment process where Three could repurchase the correct assignment that suits their needs.

In summary

Vodafone regard this proposal as having significance in the context of the EC Merger decision, the 3G Licence awards and the future shape of both spectrum assignments and the overall Mobile Market. In the light of this at Vodafone view this as a significant change to the licence conditions of the 2100 licences granted in 2001/2.

Vodafone have had concerns at the spectrum management of the transaction since it was announced and have been assured by ComReg that they have no role in the EU decision or commitments and believe the spectrum assignments are efficient -what we have now is an arbitrary change to the commitments and a view that in fact the current assignments are not efficient.

Vodafone believe that ComReg are now proposing action which is not justified by their powers, their stated aims, or their previously stated position on the merger and reserve their rights to take further action as necessary.

LTE Radio Access, Rel. RL70, Operating Documentation, Issue 01

Flexi Multiradio BTS RF Module and Remote Radio Head Description

DN0951745
Issue 08
Approval Date 2014-11-27

Flexi Remote Radio Head 2TX 2100 (FRGY)

Flexi Multiradio BTS RF Module and Remote Radio
Head Description

38 Flexi Remote Radio Head 2TX 2100 (FRGY)

FRGY technical specifications.

Functional description

Table 300 FRGY functional specification

Property	Value
Output power	2x60 W
MIMO	yes, 2TX
Outdoor installation	yes
SW supported technology	WCDMA
TX frequency range	2110-2170 MHz
RX frequency range	1920-1980 MHz
DL instantaneous bandwidth	60 MHz
UL instantaneous bandwidth	60 MHz
DL filter bandwidth	60 MHz
UL filter bandwidth	60 MHz

4 April 2016

Three Ireland (Hutchison) Limited
Registered office
28/29 Sir John Rogerson's Quay
Dublin 2, Ireland

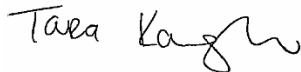
Ref: ComReg Information Notice 16/16

Dear Tom

ComReg received one submission to the above information notice, which was published today as ComReg Document 16/16s.

ComReg welcomes any views that Three Ireland may have on this submission and asks that these views be submitted to ComReg by 11 April.

Yours sincerely



Tara Kavanagh
Licensing Operations Manager

Three Ireland (Hutchison) Limited

Registered office
28/29 Sir John Rogerson's Quay
Dublin 2, Ireland

t +353 (0) 1 5426300
www.three.ie



12th April 2016

Tara Kavanagh
Licensing Operations Manager
ComReg
Irish Life Centre
Lower Abbey Street
Dublin 1.

Dear Tara

Three Ireland 2100MHz Licences – Interchange of Channels

Thank you for your letter last week regarding comments received to ComReg Document 16/16, which relates to a minor technical amendment to the 2100MHz mobile licences held by Three Ireland (Hutchison) Limited that does not impact on any other operator.

It does not surprise Three that the only comment received has come from Vodafone – an operator who is not affected by the proposed swap, but who was, until the acquisition by Three of the O2 business, unchallenged as the largest mobile provider. Vodafone is well aware that it now faces a vigorous and an equally strong competitor in Three, and that Three as the network of choice for data (we can tell from ComReg's own published reports (Doc 16/17a) and our own data that the Three network carries more mobile data each month than all other mobile networks combined) will aggressively challenge Vodafone's position in the market. The Three network is also used by 5 out of the 6 MVNOs in the Irish market, enabling retail choice and competition through its compelling wholesale offerings. It is well known in the market that Three is in the process of integrating and upgrading what was two separate networks to provide what will be the most advanced network for voice, SMS and data. It is not in Vodafone's interest for this network improvement to proceed unimpeded.

The Vodafone document submitted to ComReg seems to be based on a number of remarkable misunderstandings which blatantly misrepresent the change requested by Three. It puts forward a number of incorrect statements, and repeatedly attempts to build from this a reason why ComReg should not agree to the channel swap. None of these statements withstands minor scrutiny. These arguments have been put forward in a mischievous manner in order to confuse and delay ComReg's decision.

The channel swap requested in no way affects or alters the commitments given to the European Commission relating to the acquisition of Telefonica Ireland Limited by the Hutchison Group. Under the merger commitments, Three committed to make two lots (2x(2x5MHz)) of spectrum from the 2100MHz band available to either Virgin Media or iD, if they chose to exercise that option. This commitment remains unchanged and Three remains fully capable of fulfilling this commitment if and when the option is exercised. All of the claims

Registered Number: 316982
Place of Registration: Republic of Ireland

Directors. Canning Fok: British. Frank Sixt: Canadian. Christian Salbaing: French
Robert Finnegan: Irish. Simon Henry: British. David Hennessy: Irish

made by Vodafone consequent to this misunderstanding are null and void. It is mischievous and completely incorrect of Vodafone to state that ComReg is “*proposing to amend the outcome of the EU Merger decision*”. It is noticeable that the beneficiaries of that commitment (Virgin Media and iD) have not raised any objections to the proposed swap. For the record, the European Commission did not accept that there was a spectrum imbalance as a result of the merger requiring an appropriate remedy or commitment. This is clear from the European Commission’s decision approving the acquisition and has been pointed out to Vodafone on a number of occasions.

The Vodafone response also refers to the conditions attached to the licences themselves and implies that the channel swap requested would change the licence commitments (“*licence commitments should not be changed to give them a competitive advantage*”). In fact, no change to licence conditions is proposed, and this should be apparent to Vodafone from reading ComReg’s Information Notice. It is noteworthy that despite the claims built upon this premise, not a single licence condition change has been referenced by Vodafone. The subsequent comments relating to this point are irrelevant to the subject at hand.

It is surprising to see Vodafone refer in this matter to its abandoned High Court proceedings against ComReg challenging ComReg’s operation of its spectrum management function. The only relevance those proceedings bear for this matter is to highlight that one should be wary about the use of unsound claims regarding spectrum management and licensing to stultify ComReg in carrying out its statutory functions.

The request to ComReg to swap a channel from each licence is a technical matter which will facilitate Three’s current network integration and upgrade programme, and will benefit customers and competition. Rather than disadvantaging customers in low density areas, it will allow Three to provide coverage to even more rural areas, by eliminating the requirement to use two radio base stations where this is not necessary or replace recently installed equipment. Network investment by Three will not be reduced as a result of the change, rather it will allow the network to spread further, providing more customer benefit.

In relation to technology, we would repeat that the radio base station (RBS) equipment currently in use by Three does not have the capability to span the 60MHz bandwidth in a single RBS (which is the primary reason for making the request to ComReg in the first place) and there are a number of complicating factors surrounding the planned network upgrade that make it necessary to interchange the centre channel in each licence.

The 2100MHz Macro RBS transmitter equipment installed by Three up to this time is the Nokia model FRGT. While this RBS is capable of operating at any frequency within the 2100MHz band, it has an operational span of 30MHz, so is not capable of operating on two channels, the centre frequency of which are separated by more than 25MHz. In the case of the two spectrum assignments included in Three’s licences, the centre frequency separation spans between 35MHz at the minimum to 45MHz at maximum, so the installed base of FRGT RBSs is not capable of providing service on spectrum from both the “A” licence and the “B” licence at the same time. Had it been the case that the groups of licensed spectrum were adjacent to each other, or even separated by just one other licensee, then there would have

been no issue. As it happens, however the two licences assign spectrum at opposite ends of the band for no reason except that this was the order in which they were issued.

From June 2016, Three will be able to deploy from the Nokia Macro RBS model FRGU. On sites where this model RBS will be deployed, it is capable of spanning the full 60MHz of the 2100MHz band, however a network software upgrade is required to enable the deployment of this newer variant of Nokia RBS equipment. Three would expect to be in a position to deploy this RBS on some sites from June on, following the successful implementation of the software upgrade. This equipment was not available when Three's access network upgrade programme commenced in mid-2015. Its availability, however, does not eliminate the requirement to carry out the channel swap.

Three does not propose to deploy all six 2100MHz channels on all sites – only the sites that require higher capacity will utilise the full six channels. These tend to be busy urban sites, where only a relatively small coverage area is provided per site. In sites where it is not necessary to use more than 3 channels, Three plans to use contiguous lots rather than mixing channels from both ends of the band because it is a more sensitive and efficient configuration. This is important for rural sites where any reduction in sensitivity shrinks coverage. For this type of rural site, Three will continue to deploy the FRGT RBS in most cases.

In addition to the above, ComReg should be aware that the channel swap also facilitates the timely implementation of the upgrade in a situation where the two separate networks are being integrated. Three is in the process of replacing the existing Ericsson supplied network which operates on the "B" licence; however it is not possible in any area for the new Nokia RBS and the old Ericsson RBS to operate on the same spectrum simultaneously without causing interference. Three's preference is to introduce upgraded equipment on channels 1, 2, and 3, and to optimise service on these channels first. When this is complete, the Ericsson RBS on channels 10, 11, and 12 will cease operation for the entire upgrade area, and only then are these channels available for use on the Nokia RBS. This minimises customer disruption during the upgrade process. While this process is underway in any upgrade area, it is necessary to maintain coverage for both licences using channels 1, 2, and 3.

The access network upgrade programme commenced in mid-2015, and is due to run until mid-2017. At this time, [Confidential] sites have been upgraded and [Confidential] sites remain to be completed. The sites which have already been upgraded are using Nokia's FRGT RBS and operate only on channels 1, 2, and 3. Depending on local circumstances, in some cases, the Ericsson RBS in the same area has already been decommissioned, however in some cases they continue to operate. It is Three's intention to decommission the Ericsson RBS network entirely during the upgrade. In areas where the Nokia FRGT RBS has already been installed, it will not be possible to operate on spectrum in channels 1, 2, 3, and 10, 11, 12 without again replacing the RBS. The upgrade completed so far is mostly in rural areas, where the six channels are not required for capacity reasons. Absent the licensing requirement to operate on spectrum in both parts of the band, there would be no technological reason to do so. Without the channel swap, Three will be required to remove the existing FRGT RBS and replace it with a FRGU RBS in a significant number of these sites. This would decrease coverage from those sites on a permanent basis, would cause unnecessary service disruption while the change is again carried out, and would cause unnecessary cost. Changing the RBS requires a hardware installation on each site, and would delay the

completion of Three's network upgrade by approximately another year with adverse consequences for both the consumer and competition (from Three and the MVNO's that it hosts).

Finally, having met all of our commitments to the European Commission, Three's interest is to continue to roll-out its network improvement programme. This will bring benefits not just to three's retail customers, but also customers of the MVNO service providers who use the network (Tesco Mobile, iD, Virgin Media, Lyca Mobile, MVNE Plus). The objections submitted by Vodafone are motivated by self-interest and would only serve to impede network and retail competition.

Yours Sincerely

A handwritten signature in blue ink, appearing to read 'Tom Hickey', with a stylized flourish at the end.

Tom Hickey

Annex 2:

From: Tom Hickey [mailto:Tom.Hickey@three.ie]

Sent: 08 August 2016 11:10

To: David Thom <david.thom@comreg.ie>; Ivan Kiely <ivan.kiely@comreg.ie>; Tara Kavanagh <tara.kavanagh@comreg.ie>

Subject: Strictly Confidential - 2100MHz Equipment Details

Dave/Ivan/Tara

I am providing the information in this e-mail as follow-up to our requirement to swap the middle channel in our two 2100MHz licences. The purpose of providing this information is to clarify the extent to which the installed RF units in the 2100 band can span more than three channels and is strictly confidential. I talked through the information in the spread-sheet and the filters with Dave, in case the description here isn't adequate.

There are two items attached to this e-mail:

1. An e-mail from [**Confidential**] of Nokia that sets out the RF capability of the various 2100MHz radio units in our installed base. We are focusing on Nokia only here.
2. A spread-sheet that shows on a site by site basis what variant of the RF module is in use. [**REDACTED**]

There are 9 different variants of RF unit in operation, and they vary in age and capability. They are listed in the spread-sheet attached to [**Confidential**]'s e-mail in order, showing the newer more capable units towards the bottom of the list.

As the network consolidation programme continues, some of the older units will be replaced, but not all. We wouldn't just use the broadest bandwidth unit universally, as there are trade-offs in performance. The broader bandwidth units will only be installed on sites where more than 3 channels is likely to be required. This will be decided on a site by site basis.

If you take a look at the spread-sheet attached, it will demonstrate the current number of sites where the equipment is not capable of spanning the channels for both licences under the current arrangement. To put it simply, none of the units before FRGT are capable of more than 20 MHz. FRGT is stated to be capable of 40MHz on the TX side, and with a software upgrade applied (which Three has applied) it can be made to span 60MHz, however this comes at the cost of reduced overall performance. In the long run, we will only use FRGT on sites where we have up to three contiguous carriers, and we will use FRGU for the higher capacity sites.

Taking a look at the spread-sheet, it lists all equipment on a site by site basis. Columns T, U, and V show the on-site RF unit, and there could be up to three different units on a site. Normal practice would be to fill position RF_1 first, followed by RF_2, then FR_3, though this is not absolute.

The filters in row 2 show the range of RF unit type in each position, and allow us to filter out different types. Selecting "all" for these columns, we get [**Confidential**] records. If we now use the filters on columns T, U, and V to remove FRGT, the spread-sheet will display sites that only have previous (older) RF units. There are [**Confidential**] sites that fall into this category, i.e. [**Confidential**] sites that are currently limited to 20MHz or less. While some of

these sites will be upgraded as part of the network consolidation, not all will, and some will be upgraded to RF units that do not span 60MHz.

I hope this clarifies where the limitation arises, and it's extent.

Regards

Tom

From: [REDACTED]

Sent: 04 August 2016 16:52

To: Tom Hickey <tom.hickey@three.ie>

Subject: FW: Band 1 2100MHz RFM

Hi Tom,

2100 MHz modules in yellow below have a maximum span of 20MHz and therefore cannot use both blocks of U2100 concurrently

Regards

[REDACTED]

From: [REDACTED]

Sent: 03 August 2016 16:59

To: [REDACTED]

Subject: Band 1 2100MHz RFM

FLEXI RF-MODULE AND RRH										
Abbreviation	Module	Release	MHz	TX BW	RX BW	Tx Power	Max carriers	RFM/RRH	BTS release	Note
FRGC	Flexi RF Module 2100 Dual 50 W	Release 1	2100	10 MHZ	20 MHz	2x40W	4	RF	RAS05	Decommission
FRGD	Flexi RF Module 2100 Single 50 W	Release 1	2100	10 MHZ	20 MHz	1x40W	2	RF	RAS05	Decommission
FRGJ	Flexi RF Module 2100 Dual 50 W	Release 1	2100	10 MHZ	20 MHz	2x40W	4	RF	RAS06	Decommission
FRGK	Flexi RF Module 2100 Single 50 W	Release 1	2100	10 MHZ	20 MHz	1x40W	2	RF	RAS06	Decommission
FRGF	Flexi 3-sector RF Module 2100	Release 2	2100	10 MHZ	20 MHz	3x60W	6	RF	RU10	Decommission

FRGP	Flexi 3-sector RF Module 2100	Release 2	2100	20 MHz	20 MHz	3x60W	12	RF	RU20 on top	Ozone
FRGT	Flexi 3-sector RF Module 2100	Release 2	2100	40 MHz	60 MHz	3x80W	12	RF	RU40	Ozone Max. output power 60W in RU30EP2 on top, 80W in RU40
FRGU	Flexi 6-sector RF Module 2100	Release 3	2100	60MHz	60 MHz	6x60W	18	RF	WCDMA16	Planned not yet deployed
FRGY	Flexi RRH 2TX 2100	Release 3	2100	60 MHz	60 MHz	2x60W	6	RRH	RU50 EP1	Planned not yet deployed

[REDACTED]

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 Dublin 4.