Commission for
Communications Regulation

Submissions to Consultation

Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands

Liberalisation of the GSM Spectrum Bands & Options for the Release of Spectrum in these Bands

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1 ESB

ESB response on

ComReg consultation – "Liberalising the Use of 900 MHz and 1800 MHz Spectrum Bands: ComReg document 08/05, 17th July 2008

ESB welcomes the opportunity to comment on ComReg's proposals on liberalising the use of the 900 and 1800 MHz bands.

Introduction

Separate from normal business use, ESB currently uses GSM service for a large number of fixed telemetry devices in connection with the national electricity network. This response is concerned with ESB's current and potential future use of public data networks and public mobile networks for electrical utility use.

Responses are given below on a number of the consultation questions posed by ComReg.

Q. 2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

ESB currently has a large installed base of GSM based telemetry equipment. If future and current GSM licences (that is licences covering 900 MHz and 1800 MHz GSM bands) are changed to allow the use of these bands by other technologies will operators be able to reduce the capacity they currently have to provide GSM and GPRS service? If so will there be constraints in time (dates) or otherwise on how operators do this? How will any such constraints be defined? ESB requires a level of certainly on these issues for current uses and if it is to plan further use of services on GSM networks. A similar issue arises for all technologies and services provided by public networks – a level of information and certainty about the long term availability of services is required for these services to be considered for utility use.

In summary ESB needs to know if continued nationwide GSM/GPRS service is guaranteed and if so, for how long?

Q. 6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

ESB would potentially use a public data service (such as public mobile data on GSM or UMTS networks) with a large number of fixed access points for new communications requirements in the near future. This could be an element in an Advanced Metering system or other telemetry uses connected to the electricity

network. To use such a public service (as opposed to a private service, or a self controlled service) would require a level of certainty about long term availability of the service from the service supplier. Any requirement to visit all the access points and change equipment would be costly; therefore we would expect such requirement not to occur frequently. Ideally an external communications service supplied to ESB for this type of use would have a service life of 15 years or more. This is based on the likely minimum design service life of the electrical network equipment associated to the communications service. Any potential service that did not have a credible minimum service life of at least 7 years would potentially be classed as not suitable for use by ESB for this type of system.

Q. 7. In the absence of spectrum trading, what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.

In line with the information stated in the answer to Q. 6, ESB believes that these licenses should be of significant duration. 15 years appears to be an appropriate duration.

Q. 9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences? Please provide supporting arguments with your answer.

ESB agrees in general with this proposal. ESB will be interested to see the details of how the obligations on MVNO access conditions are defined and the process put in place to ensure a fair outcome between the parties in MVNO agreements.

Q. 10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

The same answer as given to Question 6: ESB would potentially use a public data service (such as public mobile data on GSM or UMTS networks) with a large number of fixed access points for new communications requirements in the near future. This could be an element in an Advanced Metering system or other telemetry uses connected to the electricity network. To use such a public service (as opposed to a private service, or a self controlled service) would require a level of certainty about long term availability of the service from the service supplier. Any requirement to visit all the access points and change equipment would be costly; therefore we would expect such requirement not to occur frequently. Ideally an external communications service supplied to ESB for this type of use would have a service life of 15 years or more. Any potential service that did not have a credible minimum service life of at least 7 years would potentially be classed as not suitable for use by ESB for this type of system.

2 Hutchinson 3G Ireland Ltd

Response by Hutchison 3G Ireland Limited
in respect of ComReg Doc. No. 08/57
"Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands"

30 September 2008

Executive Summary

Hutchison 3G Ireland Limited ("H3GI") welcomes the opportunity to respond to ComReg Doc. No. 08/57 *"Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands"*. The pending abolition of the GSM Directive, European Commission decision on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community and expiry of the licences of the current 900 MHz licence holders represent a significant development in the mobile market in Ireland. In particular, they permit the use of 900 and 1800 MHz for 3G purposes. In this regard, it is important that ComReg ensures equality of opportunity for all 3G operators, including H3GI (The only 3G operator that does not have any 900 or 1800 MHz spectrum) and compensates H3GI for the significant competitive disadvantage that it faces by virtue of historic advantages enjoyed by the incumbent operators, namely Vodafone, O2 and Meteor.

In relation to the implementation of the pending Commission Decision:

1. H3GI does not believe that ComReg is obliged by the Commission Decision to vary the existing 2G regulations and all current 2G licences so as to permit use by Vodafone, O2 and Meteor of UMTS in the 900 and 1800 MHz bands as soon as practicable following the coming into force of the Commission Decision. H3GI believes that to do so infringes the principles of equality, the promotion of competition, the promotion of the interests of users, the development of the internal market and the efficient management and use of spectrum contrary to ComReg's statutory functions and objectives. H3GI believes that to do so infringes the principle of regulatory certainty. It runs contrary to the expectation H3GI had when it acquired its 3G licence and upon which it has invested significantly in the Irish market. It confers a significant cost advantage on H3GI's competitors without any appropriate justification. H3GI believes that to do so runs contrary to European Community policy as reflected in the UMTS Decision. H3GI believes that to do so may infringe State aid law. Spectrum is a State resource. ComReg is proposing to confer a competitive advantage on particular companies within an industry. ComReg's proposal will have an impact on trade between Member States.

2. H3GI believes that ComReg should permit the use of such spectrum by Vodafone, O2 and Meteor when it is appropriate to do so having regard to the above principles.

3. Subject to our comments above, H3GI does not have any difficulty in principle with service neutrality. H3GI looks forward to a consultation in respect of same at an appropriate time.

4. Subject to our comments above, H3GI agrees with ComReg's proposed approach regarding revised annual licence fees. ComReg must ensure that Meteor does not enjoy any unfair cost advantage in the roll out of its 3G network by virtue of being able to use 2G spectrum for 3G purposes.

In relation to the future licensing of the 900 MHz band:

1. H3GI agrees with ComReg's proposal to place a cap of 2 x 10 MHz on the amount of spectrum that any one licensee can hold in the 900 MHz band.

2. H3GI does not have any difficulty in principle with service neutrality. It looks forward to a consultation in respect of same at an appropriate time.

3. H3GI believes that ComReg should issue licences of 15 years duration. H3GI agrees with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band. H3GI believes that such an approach is consistent with the efficient management and use of spectrum.

4. H3GI believes that coverage and quality of service licence obligations should reflect the services being provided by the licence holder ie if 3G services are being provided by means of 2G spectrum, licences should reflect the coverage and quality of service licence obligations contained in the licence holder's 3G licence.

5. H3GI does not believe that a Mobile Virtual Network Operator (MVNO) access obligation is necessary. There is sufficient competition in the Irish mobile market to provide services to the customers of Vodafone, O2 or Meteor in the event that either of these operators were to lose or effectively lose its licence. Ireland has one of the most efficient mobile number portability (MNP) systems in Europe. A mobile customer can port its number to an alternative service provider within 2 hours and 1,217,205 mobile customers have ported their numbers to alternative service providers since 2003. Whilst some mobile customers may not be aware that they can retain their mobile numbers in the event that they switch service providers, this is something that could be overcome by an appropriate information campaign. H3GI notes and agrees with ComReg's comments in respect of possible changes to the current MNP process.

6. H3GI agrees with ComReg's proposal to introduce technology neutrality in the 900 MHz band.

7. H3GI agrees with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 900 MHz spectrum assignments.

8. H3GI agrees with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences.

In relation to ComReg's Options for future licensing of the 900 MHz band:

1. In addition to taking into account the implications for existing licensees in assessing the consultation questions, ComReg must take into account the implications for H3GI. H3GI has invested in excess of €500 million in rolling out its 3G network and competing in the Irish mobile market. ComReg's is proposing to issue new licences in respect of the 900 MHz spectrum band and permit their use for 3G purposes. As discussed below, 900 MHz will provide a 3G operator with significant cost savings. 3G will progressively replace 2G in the provision of services in the mobile market. In contrast with the other holders of 3G licences, namely, Vodafone, O2 and Meteor, H3GI does not have any 900 MHz spectrum.

2. H3GI does not believe that the existing 900 MHz licensees require a minimum of 2 x 10 MHz of contiguous 900 MHz spectrum with which to roll out a 3G network and maintain GSM services in the short-term (until GSM technology is eventually replaced). ComReg has appointed external consultants to analyse the technical implications of liberalisation of the 900 and 1800 MHz bands, taking into account the expiry dates and conditions contained in the existing 2G licences. It should:

    a) Estimate current 2G traffic levels on the 900 MHz and 1800 MHz networks;

    b) Inform itself in relation to mitigation techniques that could be deployed to assist the migration process;

    c) Obtain information from the 2G operators on their network hierarchy and the mitigation techniques they have deployed; and

    d) Conduct a market development assessment as this will feed into the modelling of demand for 3G services.

3. H3GI agrees with ComReg's intention to limit the total amount of 900 MHz spectrum that any operator would be permitted to gain spectrum rights to a maximum of 2 x 10 MHz.

4. H3GI supports Options B and C in the following order: (i) Option C; and (ii) Option B. It does not support Option A. It does so for the following reasons. A single auction is preferable from an administrative and financial point of view. Reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will promote competition and the interests of end-users. Without prejudice to H3GI's views set out above, if ComReg decides to permit use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will mitigate the competitive harm done by such a decision. If ComReg decides against permitting use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will compensate H3GI for the historic competitive advantage

enjoyed by the incumbent operators, namely, Vodafone, O2 and Meteor. The incumbent 2G operators have extensive GSM networks; consequently it is far easier in terms of time and logistics and considerably less expensive for an existing 900 MHz 2G operator to upgrade its existing sites for 3G than it is for an operator that has to start from the very beginning. H3GI is significantly disadvantaged as it faces the full costs of site acquisition, site build, commissioning of base stations, etc. In Annex 2, we attach a copy of a confidential paper submitted by the 3 Group to the European Commission dated 25 March 2007 in respect of the differential impact of spectrum refarming. Equally significant is the fact that the deployment of 900 MHz infrastructure will take a considerable time to implement. The 16th recital to the Commission Decision provides: *"Differences in the national legacy situations could result in competitive distortions. The existing regulatory framework gives Member States the tools to deal with these problems in a proportionate, non-discriminatory and objective manner, subject to Community law including the Authorisation Directive and the Framework Directive."* H3GI agrees with the comment by ComReg that *"Option C has a greater potential to promote competition by providing applicants with no current presence in the band with the greatest opportunity to acquire 900 MHz spectrum which could be used shortly after the completion of the licence competition in 2009."* Finally, seven blocks of 5 MHz is the appropriate division of the available spectrum.

5. In relation to Option C:

   a) H3GI believes that at least one 2 x 5 MHz block should be reserved for new entrants. If ComReg decides to reserve two 2 x 5 MHz blocks for new entrants, both blocks should be capable of being won by the one new entrant.

   b) ComReg states: *"If there was one new entrant then Block A could be reserved and to ensure that a fair price was paid for that licence, the licence fee payable could, for example, be set as the average price of all other 900 MHz blocks awarded in the competition."* H3GI does not agree with this illustrative approach. In relation to any block of 2 x 5 MHz of currently unallocated 900 MHz reserved for a new entrant, ComReg should determine an appropriate reserve price. The opportunity value of any block of 2 x 5 MHz of currently unallocated 900 MHz reserved for a new entrant will be less than any block of 2 x 5 MHz of 900 MHz available to an existing operator. In the absence of a 3G licence, a new entrant will not provide 2G services. As an exclusive provider of 3G services, H3GI does not intend to provide 2G services in Ireland. This is consistent with its group and historic approach, and the pending replacement of 2G by 3G technology.

In relation to the future licensing of the 1800 MHz band, if ComReg decides to permit use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, ComReg should grant H3GI equivalent 1800 MHz spectrum for 3G purposes, if requested.

If ComReg fails to take sufficient account of H3GI's views, it runs the risk of cementing the incumbent operators' historic competitive advantage and preventing

the emergence of effective competition. H3GI looks forward to a consultation in respect of the proposed auction(s).

Introduction

The purpose of this document is to respond to ComReg Doc. No. 08/57 *"Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands"*.

The format of this document is:

1. Part 1 addresses ComReg's general comments.
2. Part 2 addresses implementation of the pending Commission Decision.
3. Part 3 addresses the future licensing of the 900 MHz band.
4. Part 4 addresses options for future licensing of the 900 MHz band.
5. Part 5 addresses the future licensing of the 1800 MHz band.
6. Annex 1 contains responses to ComReg's consultation questions.
7. Annex 2 contains a confidential paper submitted by the 3 Group to the European Commission dated 25 March 2007 in respect of the differential impact of spectrum refarming.

Part 1 – General Comments

Hutchison 3G Ireland Limited ("H3GI") welcomes the opportunity to respond to ComReg Doc. No. 08/57 *"Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands"* (the "Consultation Paper"). The pending abolition of the GSM Directive[1], European Commission decision on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community[2] (the "Commission Decision") and expiry of the licences of the current 900 MHz licence holders represent a significant development in the mobile market in Ireland. In particular, they permit the use of 900 and 1800 MHz for 3G purposes. In this regard, it is important that ComReg ensures equality of opportunity for all 3G operators, including H3GI (The only 3G operator that does not have any 900 or 1800 MHz spectrum) and compensates H3GI for the significant competitive disadvantage that it faces by virtue of historic advantages enjoyed by the incumbent operators, namely Vodafone, O2 and Meteor.

Use of 2G Spectrum for 3G Purposes

900 MHz spectrum is particularly valuable for rural coverage due to its propagation characteristics which allow coverage of larger distances, and achieves better in-building penetration than higher frequencies such as 2.1 GHz. The better propagation characteristics of 900 MHz spectrum also provides greater flexibility in site location and means that sites can be located adjacent to, rather than in, populated areas which involve greater planning difficulties.

[1] Council Directive 87/372/EEC of 25 June 1987 on the frequency bands to be reserved for the coordinated introduction of public pan-European cellular digital land-based mobile communications in the Community.
[2] RSCOM07-04 Final.

The deployment of cell sites at 900 MHz in order to achieve coverage in rural areas would dramatically decrease the costs of network rollout in those areas. The resulting cell radii of sites at 900 MHz means that less base stations would be required. Depending on geography and population density, the 3 Group[3] has estimated that there could be anything between 35% and 75% fewer base stations at 900 MHz than at 2.1 GHz. Also, having access to 1800 MHz spectrum can reduce the number of sites required for capacity (cell splitting) and therefore an operator can afford to deploy more sites for coverage rather than capacity.

In addition to cost savings, access to the GSM frequency bands would allow operators to achieve a faster network deployment for both new coverage areas and in-fill coverage within its existing population coverage footprint.

The Impact of Spectrum Refarming

The impact of spectrum refarming will be more pronounced in Ireland than elsewhere because the 2.6 GHz band[4] will not become available until at least 2014 whereas this band will become generally available across most European states in the next year or so.

Independent Analysis by Vilicom

On page 15 of the Consultation Paper, ComReg states:

"ComReg has commissioned independent analysis of the cost savings of rolling out a 3G network at 900 MHz compared to 1800 MHz and 2100 MHz. This suggests that the cost savings to be gained by an operator using 900 MHz are estimated to be 26% in the case of 1800 MHz and 35% in the case of 2100 MHz."

ComReg further states:

"These figures are taken from a report produced by Vilicom which was commissioned by ComReg in 2008. ComReg is unable to publish this report due to the confidential nature of the data and information relied upon by Villicom to obtain its findings."[5]

H3GI notes these figures and the comments made by ComReg and reserves its rights in respect thereof. It did not participate in any report produced by Vilicom.

[3] The 3 Group is part of the Hutchison Whampoa Limited telecommunications division, operating 3G mobile telecommunications networks under the 3 brand in 6 EU Member States: Austria, Denmark, Ireland, Italy, Sweden and the UK. In just 3 years, the 3 Group has spent over €19 billion acquiring licences and rolling out its mobile broadband networks in these countries.
[4] Additional, harmonised 3G centric spectrum.
[5] At footnote 24 of the Consultation Paper.

Part 2 - Implementation of the Pending Commission Decision

Implementation of the Draft Decision

In relation to ComReg's proposal to *"vary existing regulations under which all 900 MHz and 1800 MHz licences are issued, and all current 900 MHz and 1800 MHz licences, so as to permit use by licensees of UMTS. ComReg proposes to do so as soon as practicable following the coming into force of the EC Decision to enable the earliest realisation of the benefits of liberalisation"*, H3GI does not believe that ComReg is obliged by the Commission Decision to vary the existing 2G regulations and all current 2G licences so as to permit use by Vodafone, O2 and Meteor of UMTS in the 900 and 1800 MHz bands as soon as practicable following the coming into force of the Commission Decision.

H3GI believes that to do so infringes the principles of equality, the promotion of competition, the promotion of the interests of users, the development of the internal market and the efficient management and use of spectrum contrary to ComReg's statutory functions and objectives.[6] H3GI does not have any 900 or 1800 MHz spectrum and yet ComReg is proposing to provide its competitors with the opportunity to use such spectrum for 3G purposes in advance of any competition for the award of such spectrum.[7][8] As discussed above, 900 MHz used for 3G purposes produces significant cost savings. ComReg is proposing to confer a significant cost advantage on H3GI's competitors without any appropriate justification. Spectrum is a key input for the provision of 3G services and a finite resource.

H3GI believes that to do so infringes the principle of regulatory certainty. It runs contrary to the expectation H3GI had when it acquired its 3G licence and upon which it has invested significantly in the Irish market. It confers a significant cost advantage on H3GI's competitors without any appropriate justification. Changes to regulatory policy must recognise and address what has gone on before. Where investments by operators are based on clear policy statements which subsequently prove to be unreliable, the value of the spectrum is diminished and the relevant business plans are undermined. This is not only a legacy issue, but impacts on decision going forward. Not only will the current holder of the spectrum be reluctant to invest further, the resulting uncertainty will also impact on other potential investors' view of the viability of business plans and hence the value of the spectrum to them. Hence, undertakings will not acquire spectrum and/or will invest less if they perceive a significant risk that conditions on which it was acquired cannot be relied upon to

[6] Section 12 of the Communications Regulation Act, 2002, as amended, regulation 23 (1) of the European Communities Networks and Services)(Framework) Regulations, 2003, as amended and regulations 9 and 11 of the European Communities (Electronic Communications Networks and Services)(Authorisation) Regulations, 2003, as amended.
[7] At page 20 of the Consultation Paper.
[8] Whilst H3GI was provided with an opportunity to apply for 900 and/or 1800 spectrum as part of the original 3G mobile licence competition[8], the purpose of that offer was to provide H3GI with an opportunity to provide 2G services over 900 and/or 1800 spectrum. H3GI is an exclusively 3G service provider. It therefore did not apply for such spectrum. The availability of such spectrum for 3G purposes was not certain at that time. This historic offer does not relieve ComReg of its obligations to adhere to the principles of equality, the promotion of competition, the promotion of the interests of users, the development of the internal market and the efficient management and use of spectrum.

continue. Reneging on commitments will also impact on the credibility of future awards, making them inefficient. If the credibility of auctions is undermined by changing the 'rules' *ex post*, valuations in future auctions will also be undermined. Hence, future auctions may not result in the most efficient outcome, with an adverse effect on the economy.

H3GI believes that to do so runs contrary to European Community policy as reflected in the UMTS Decision.[9] This policy is to maximise the likelihood of EU consumers receiving the next generation of mobile telephony services as early as possible, including in particular: (i) the rapid introduction of UMTS networks and services in the EU (Article 1); (ii) UMTS coverage in less populated areas (Article 4 (2)); and (iii) the creation of a favourable climate for investment and deployment of UMTS with the widest possible territorial coverage (Recital 8).

H3GI believes that to do so may infringe State aid law. Spectrum is a State resource. ComReg is proposing to confer a competitive advantage on particular companies within an industry. ComReg's proposal will have an impact on trade between Member States.

H3GI believes that ComReg should permit the use of such spectrum by Vodafone, O2 and Meteor when it is appropriate to do so having regard to the above principles. ComReg would appear to have failed to consider and conduct a cost/benefit analysis in respect of the possibility of reducing Meteor's licence.

Proposed Amendments to Existing 900 MHz and 1800 MHz Licences

Service Neutrality

Subject to our comments above, H3GI makes the following comments. H3GI does not have any difficulty in principle with ComReg's proposed approach. However, ComReg does not set out any detail in respect of its proposed approach. H3GI looks forward to a consultation in respect of same at an appropriate time.

Revised Annual Fees for Licences

Subject to our comments above, H3GI makes the following comments. H3GI agrees with ComReg's proposed approach. However, it should not presume that the existing 2G operators will be successful in obtaining either currently unallocated 2G spectrum or 2G spectrum on the expiry of the existing licence holders' licences. In addition, ComReg must ensure that Meteor does not enjoy any unfair cost advantage in the roll out of its 3G network by virtue of being able to use 2G spectrum for 3G purposes. In the interests of transparency, H3GI hereby requests ComReg to confirm in its response to this consultation paper that it proposes to implement this review prior to permitting use by 2G operators of UMTS.

[9] Decision No 128/1999/EC of the European Parliament and of the Council of 14 December 1998 on the coordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community.

Part 3 - Future Licensing of the 900 MHz Band

Limit on 900 MHz Spectrum per Operator

H3GI agrees with ComReg's proposal to place a cap of 2 x 10 MHz on the amount of spectrum that any one licensee can hold in the 900 MHz band.

Service Neutrality

H3GI does not have any difficulty in principle with ComReg's proposed approach. However, ComReg does not set out any detail in respect of its proposed approach. H3GI looks forward to a consultation in respect of same at an appropriate time.

Licence Duration

H3GI believes that ComReg should issue licences of 15 years duration. H3GI agrees with ComReg's proposal that a common termination dated should be applied to all new licences in the 900 MHz band. H3GI believes that such an approach is consistent with the efficient management and use of spectrum.

Coverage and Quality of Service Requirements

H3GI believes that coverage and quality of service licence obligations should reflect the services being provided by the licence holder ie if 3G services are being provided by means of 2G spectrum, licences should reflect the coverage and quality of service licence obligations contained in the licence holders' 3G licences.

Mobile Virtual Network Operator Access

H3GI does not believe that an MVNO access obligation is necessary. There is sufficient competition in the Irish mobile market to provide services to the customers of Vodafone, O2 or Meteor in the event that either of these operators were to lose or effectively lose its licence. Ireland has one of the most efficient mobile number portability (MNP) systems in Europe. A mobile customer can port its number to an alternative service provider within 2 hours[10] and 1,296,600 mobile customers have ported their numbers to alternative service providers since 2003.[11] Whilst some mobile customers may not be aware that they can retain their mobile numbers in the event that they switch service providers, this is something that could be overcome by an appropriate information campaign. H3GI notes and agrees with ComReg's comments in respect of possible changes to the current MNP process.

Technology Neutrality

H3GI agrees with ComReg's proposal to introduce technology neutrality in the 900 MHz band.

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[10] Page 24 of the Inter-Operator Mobile Number Portability Process Manual dated 23 September 2003.

[11] Page 54 of ComReg Doc. No. 08/75 *"Irish Communications Market: Quarterly Key Data Report – Q2 2008"*.

Spectrum Block Size

H3GI agrees with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 900 MHz spectrum assignments.

Frequency Coordination and Interference Mitigation

H3GI agrees with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences.

Part 4 - Options for Future Licensing of the 900 MHz Band

Relevant Factors for Assessing the Consultation Questions – Implications for Existing Licensees

In addition to taking into account the implications for existing licensees in assessing the consultation questions, ComReg must take into account the implications for H3GI. H3GI has invested in excess of €500 million in rolling out its 3G network and competing in the Irish mobile market. ComReg's is proposing to issue new licences in respect of the 900 MHz spectrum band and permit their use for 3G purposes. As discussed above, 900 MHz will provide a 3G operator with significant cost savings. 3G will progressively replace 2G in the provision of services in the mobile market. In contrast with the other holders of 3G licences, namely, Vodafone, O2 and Meteor, H3GI does not have any 900 MHz spectrum.

H3GI does not believe that the existing 900 MHz licensees require a minimum of 2 x 10 MHz of contiguous 900 MHz spectrum with which to roll out a 3G network and maintain GSM services in the short-term (until GSM technology is eventually replaced). ComReg has appointed external consultants to analyse the technical implications of liberalisation of the 900 and 1800 MHz bands, taking into account the expiry dates and conditions contained in the existing 2G licences.[12] It should:

1. Estimate current 2G traffic levels on the 900 MHz and 1800 MHz networks.

   This information will greatly assist in determining whether and to what extent mitigation techniques need to be deployed, the resulting costs and resource implications and an estimate of what would be a reasonable, but challenging, period to transition spectrum for 3G use. H3GI recognises that the transition process will cause some disruption and will require a co-ordinated approach to minimise these effects but notes that the subscriber base per MHz in Ireland is relatively low compared to some other European countries. This suggests that freeing up capacity will not be as challenging here as in some other European countries.

2. Inform itself in relation to mitigation techniques that could be deployed to assist the migration process eg as the existing 2G licence holders have 1800 MHz spectrum in addition to 900 MHz it is possible to use multi-layer resource management techniques to switch traffic to the 1800 MHz network or Synthesised Frequency Hopping (SFH) to spread interference and thereby

[12] ComReg Doc. No. 08/39.

allow better frequency re-use. This latter option has the added advantage that it has minimal impact on network quality.

3. Obtain information from the 2G operators on their network hierarchy, ie is P-GSM 900 used for coverage layer with GSM 1800 providing a capacity layer? Estimation of current 2G traffic levels on the 900 MHz and 1800 MHz networks will corroborate this information. ComReg needs to ascertain what techniques have been deployed by 2G operators, eg has SFH been applied? Other techniques for increasing capacity in the GSM networks include deploying more base stations/cell splitting and in-building picocells. Ireland benefits from having contiguous allocations of spectrum in the 900 and 1800 MHz bands – this removes the need to reconfigure fragmented allocations that occur in some European countries.

4. Conduct a market development assessment as this will feed into the modelling of demand for 3G services.

   There is growing evidence of rapid take-up of 3G enabled handsets. Some European countries report over 80% of new handsets are 3G enabled and there is increasing adoption of mobile broadband services. H3GI believes that this trend will accelerate over the coming months as mobile broadband services become increasingly common-place and will become ubiquitous in the next few years. ComReg will need to obtain the latest market information as this will be a critical input to any modelling of future developments for 3G services generally and help gauge anticipated growth of UMTS900/UMTS1800 services.

Promotion of Competition

H3GI agrees with ComReg's intention to limit the total amount of 900 MHz spectrum that any operator would be permitted to gain spectrum rights to a maximum of 2 x 10 MHz.

Options A, B and C

H3GI supports Options B and C in the following order: (i) Option C; and (ii) Option B. It does not support Option A. It does so for the following reasons. A single auction is preferable from an administrative and financial point of view. Reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will promote competition and the interests of end-users. Without prejudice to H3GI's views set out above, if ComReg decides to permit use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will mitigate the competitive harm done by such a decision. If ComReg decides against permitting use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will compensate H3GI for the historic competitive advantage enjoyed by the incumbent operators, namely, Vodafone, O2 and Meteor. The incumbent 2G operators have extensive GSM networks; consequently it is far easier in terms of time and logistics and considerably less expensive for an existing 900 MHz 2G operator to upgrade its existing sites for 3G

than it is for an operator that has to start from the very beginning. H3GI is significantly disadvantaged as it faces the full costs of site acquisition, site build, commissioning of base stations, etc. In Annex 2, we attach a copy of a confidential paper submitted by the 3 Group to the European Commission dated 25 March 2007 in respect of the differential impact of spectrum refarming. Equally significant is the fact that the deployment of 900 MHz infrastructure will take a considerable time to implement. The 16th recital to the Commission Decision provides: *"Differences in the national legacy situations could result in competitive distortions. The existing regulatory framework gives Member States the tools to deal with these problems in a proportionate, non-discriminatory and objective manner, subject to Community law including the Authorisation Directive and the Framework Directive."* H3GI agrees with the comment by ComReg that *"Option C has a greater potential to promote competition by providing applicants with no current presence in the band with the greatest opportunity to acquire 900 MHz spectrum which could be used shortly after the completion of the licence competition in 2009."* Finally, seven blocks of 5 MHz is the appropriate division of the available spectrum.

In relation to Option C:

1. H3GI believes that:

   a) At least one 2 x 5 MHz block should be reserved for new entrants; and

   b) If ComReg decides to reserve two 2 x 5 MHz blocks for new entrants, both blocks should be capable of being won by the one new entrant.

2. ComReg states: *"If there was one new entrant then Block A could be reserved and to ensure that a fair price was paid for that licence, the licence fee payable could, for example, be set as the average price of all other 900 MHz blocks awarded in the competition."*[13] H3GI does not agree with this illustrative approach. In relation to any block of 2 x 5 MHz of currently unallocated 900 MHz reserved for a new entrant, ComReg should determine an appropriate reserve price. The opportunity value of any block of 2 x 5 MHz of currently unallocated 900 MHz reserved for a new entrant will be less than any block of 2 x 5 MHz of 900 MHz available to an existing operator. In the absence of a 3G licence, a new entrant will not provide 2G services. As an exclusive provider of 3G services, H3GI does not intend to provide 2G services in Ireland. This is consistent with its group and historic approach, and the pending replacement of 2G by 3G technology.

3. H3GI agrees with the following comments by ComReg:

   a) *"Making available unused spectrum would increase efficiency in use of the 900 MHz Band"*;

   b) *"If Block A was to be reserved for new entrants, it would leave three contiguous 10 MHz blocks of spectrum in the rest of the band which could be bid upon by existing and potential operators."*;

[13] At page 43 of the Consultation Paper.

c) *"By creating 5 MHz blocks of spectrum it would minimise the risk of creating isolated and unused blocks of spectrum"*;

d) *"Awarding all blocks in a single competitive process would assist applicants in acquiring spectrum blocks when and where they valued them most"*;

e) *"It would provide a high degree of visibility and certainty to both existing licensees and potential operators as the competitive award process would be completed by late 2009. All stakeholders would then be fully aware of the outcome of the licence competition well in advance of the expiry of the first 900 MHz licences in May 2011, and the third license in June 2015. This would allow existing licensees sufficient time to make appropriate plans regarding the expiry of their existing licences"*; and

f) *"Option C has a greater potential to promote competition by providing applicants with no current presence in the band with the greatest opportunity to acquire 900 MHz spectrum which could be used shortly after the completion of the licence competition in 2009."*[14]

In relation to Option B, H3GI agrees with the following comments by ComReg:

1. *"Making available unused spectrum would increase efficiency in use of the 900 MHz band"*;

2. *"It would create three contiguous 10 MHz blocks of spectrum which could be bid upon by existing and potential licensees"*;

3. *"By creating 5 MHz blocks of spectrum it would minimise the risk of creating isolated and unused blocks of spectrum"*;

4. *"Awarding all blocks in a single competitive process would facilitate applicants in acquiring spectrum blocks when and where they valued them most"*;

5. *"It would create a high degree of visibility and certainty to both existing licensees and potential operators as the competitive award process would be completed by late 2009. All parties would then be fully aware of the outcome of the licence competition well in advance of the expiry of the first 900 MHz licences in May 2011, and the third license in June 2015. This would allow existing licensees sufficient time to make appropriate plans regarding the expiry of their existing licences"*; and

6. *"If new entrants acquire 900 MHz spectrum, then competition should increase and as a result consumers should benefit from increased choice, lower prices, better service and the earlier introduction of new products and services."*[15]

[14] At page 46 of the Consultation Paper.
[15] At page 42 of the Consultation Paper.

Part 5 - Future Licensing of the 1800 MHz Band

If ComReg decides to permit use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, ComReg should grant H3GI equivalent 1800 MHz spectrum for 3G purposes, if requested.

Conclusion

The pending abolition of the GSM Directive, European Commission and expiry of the licences of the current 900 MHz licence holders represent a significant development in the mobile market in Ireland. In particular, they permit the use of 900 and 1800 MHz for 3G purposes. In this regard, it is important that ComReg ensures equality of opportunity for all 3G operators, including H3GI (The only 3G operator that does not have any 900 or 800 MHz spectrum) and compensates H3GI for the significant competitive disadvantage that it faces by virtue of historic advantages enjoyed by the incumbent operators, namely Vodafone, O2 and Meteor. If ComReg fails to take sufficient account of H3GI's views, it runs the risk of cementing the incumbent operators' historic competitive advantage and preventing the emergence of effective competition. H3GI looks forward to a consultation in respect of the proposed auction(s).

ANNEX 1 – CONSULTATION QUESTIONS

Q. 1. Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions? Please provide supporting arguments with your answer.

H3GI does not believe that ComReg is obliged by the Commission Decision to vary the existing 2G regulations and all current 2G licences so as to permit use by Vodafone, O2 and Meteor of UMTS in the 900 and 1800 MHz bands as soon as practicable following the coming into force of the Commission Decision.

H3GI believes that to do so infringes the principles of equality, the promotion of competition, the promotion of the interests of users, the development of the internal market and the efficient management and use of spectrum contrary to ComReg's statutory functions and objectives.[16] H3GI does not have any 900 or 1800 MHz spectrum and yet ComReg is proposing to provide its competitors with the opportunity to use such spectrum for 3G purposes in advance of any competition for the award of such spectrum.[17][18] As discussed above, 900 MHz used for 3G purposes produces significant cost savings. ComReg is proposing to confer a significant cost advantage on H3GI's competitors without any appropriate justification. Spectrum is a key input for the provision of 3G services and a finite resource.

H3GI believes that to do so infringes the principle of regulatory certainty. It runs contrary to the expectation H3GI had when it acquired its 3G licence and upon which it has invested significantly in the Irish market. It confers a significant cost advantage on H3GI's competitors without any appropriate justification. Changes to regulatory policy must recognise and address what has gone on before. Where investments by operators are based on clear policy statements which subsequently prove to be unreliable, the value of the spectrum is diminished and the relevant business plans are undermined. This is not only a legacy issue, but impacts on decision going forward. Not only will the current holder of the spectrum be reluctant to invest further, the resulting uncertainty will also impact on other potential investors' view of the viability of business plans and hence the value of the spectrum to them. Hence, undertakings will not acquire spectrum and/or will invest less if they perceive a significant risk that conditions on which it was acquired cannot be relied upon to continue. Reneging on commitments will also impact on the credibility of future

[16] Section 12 of the Communications Regulation Act, 2002, as amended, regulation 23 (1) of the European Communities Networks and Services)(Framework) Regulations, 2003, as amended and regulations 9 and 11 of the European Communities (Electronic Communications Networks and Services)(Authorisation) Regulations, 2003, as amended.
[17] At page 20 of the Consultation Paper.
[18] Whilst H3GI was provided with an opportunity to apply for 900 and/or 1800 spectrum as part of the original 3G mobile licence competition[18], the purpose of that offer was to provide H3GI with an opportunity to provide 2G services over 900 and/or 1800 spectrum. H3GI is an exclusively 3G service provider. It therefore did not apply for such spectrum. The availability of such spectrum for 3G purposes was not certain at that time. This historic offer does not relieve ComReg of its obligations to adhere to the principles of equality, the promotion of competition, the promotion of the interests of users, the development of the internal market and the efficient management and use of spectrum.

awards, making them inefficient. If the credibility of auctions is undermined by changing the 'rules' *ex post*, valuations in future auctions will also be undermined. Hence, future auctions may not result in the most efficient outcome, with an adverse effect on the economy.

H3GI believes that to do so runs contrary to European Community policy as reflected in the UMTS Decision.[19] This policy is to maximise the likelihood of EU consumers receiving the next generation of mobile telephony services as early as possible, including in particular: (i) the rapid introduction of UMTS networks and services in the EU (Article 1); (ii) UMTS coverage in less populated areas (Article 4 (2)); and (iii) the creation of a favourable climate for investment and deployment of UMTS with the widest possible territorial coverage (Recital 8).

H3GI believes that to do so may infringe State aid law. Spectrum is a State resource. ComReg is proposing to confer a competitive advantage on particular companies within an industry. ComReg's proposal will have an impact on trade between Member States.

H3GI believes that ComReg should permit the use of such spectrum by Vodafone, O2 and Meteor when it is appropriate to do so having regard to the above principles. ComReg would appear to have failed to consider and conduct a cost/benefit analysis in respect of the possibility of reducing Meteor's licence.

Q. 2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Subject to our comments above, H3GI makes the following comments. H3GI does not have any difficulty in principle with ComReg's proposed approach. However, ComReg does not set out any detail in respect of its proposed approach. H3GI looks forward to a consultation in respect of same at an appropriate time.

Q. 3. Do you agree that a review of the annual licence fees is appropriate at this time to determine whether or not these fees should be adjusted to take into account the increased value associated with liberalised 900 MHz licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Subject to our comments above, H3GI makes the following comments. H3GI agrees with ComReg's proposed approach. However, it should not presume that the existing 2G operators will be successful in obtaining either currently unallocated 2G spectrum or 2G spectrum on the expiry of the existing licence holders' licences. In addition, ComReg must ensure that Meteor does not enjoy any unfair cost advantage in the roll out of its 3G network by virtue of being able to use 2G spectrum for 3G purposes. In the interests of transparency, H3GI hereby requests ComReg to

[19] Decision No 128/1999/EC of the European Parliament and of the Council of 14 December 1998 on the coordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community.

confirm in its response to this consultation paper that it proposes to implement this review prior to permitting use by 2G operators of UMTS.

Q. 4. Do you agree with ComReg's proposal that an auction mechanism is the most appropriate format for granting future 900 MHz spectrum licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes. H3GI looks forward to a consultation in respect of the proposed auction(s).

Q. 5. Do you agree with ComReg's proposal to place a cap of 2 × 10 MHz on the amount of spectrum that any one licensee can hold in this band? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

H3GI agrees with ComReg's proposal to place a cap of 2 x 10 MHz on the amount of spectrum that any one licensee can hold in the 900 MHz band.

Q. 6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

H3GI does not have any difficulty in principle with ComReg's proposed approach. However, ComReg does not set out any detail in respect of its proposed approach. H3GI looks forward to a consultation in respect of same at an appropriate time.

Q. 7. In the absence of spectrum trading, what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.

H3GI believes that ComReg should issue licences of 15 years duration.

Q. 8. Do you agree with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band? Please provide supporting arguments with your answer.

H3GI agrees with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band. H3GI believes that such an approach is consistent with the efficient management and use of spectrum.

Q. 9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences? Please provide supporting arguments with your answer.

H3GI does not believe that an MVNO access obligation is necessary. There is sufficient competition in the Irish mobile market to provide services to the customers of Vodafone, O2 or Meteor in the event that either of these operators were to lose or effectively lose its licence. Ireland has one of the most efficient mobile number portability (MNP) systems in Europe. A mobile customer can port its number to an

alternative service provider within 2 hours[20] and 1,296,600 mobile customers have ported their numbers to alternative service providers since 2003.[21] Whilst some mobile customers may not be aware that they can retain their mobile numbers in the event that they switch service providers, this is something that could be overcome by an appropriate information campaign. H3GI notes and agrees with ComReg's comments in respect of possible changes to the current MNP process.

Q. 10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

H3GI agrees with ComReg's proposal to introduce technology neutrality in the 900 MHz band.

Q. 11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

H3GI agrees with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 900 MHz spectrum assignments.

Q. 12. Do you agree with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

H3GI agrees with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences.

Q. 13. Do you support Option A? Please provide supporting arguments with your answer.

H3GI supports Options B and C in the following order: (i) Option C; and (ii) Option B. It does not support Option A. It does so for the following reasons. A single auction is preferable from an administrative and financial point of view. Reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will promote competition and the interests of end-users. Without prejudice to H3GI's views set out above, if ComReg decides to permit use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will mitigate the competitive harm done by such a decision. If ComReg decides against permitting use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, reservation of at least one block of 2 x 5 MHz of currently unallocated 900 MHz for a new entrant will compensate H3GI for the historic

[20] Page 24 of the Inter-Operator Mobile Number Portability Process Manual dated 23 September 2003.
[21] Page 54 of ComReg Doc. No. 08/75 *"Irish Communications Market: Quarterly Key Data Report – Q2 2008"*.

competitive advantage enjoyed by the incumbent operators, namely, Vodafone, O2 and Meteor. The incumbent 2G operators have extensive GSM networks; consequently it is far easier in terms of time and logistics and considerably less expensive for an existing 900 MHz 2G operator to upgrade its existing sites for 3G than it is for an operator that has to start from the very beginning. H3GI is significantly disadvantaged as it faces the full costs of site acquisition, site build, commissioning of base stations, etc. In Annex 2, we attach a copy of a confidential paper submitted by the 3 Group to the European Commission dated 25 March 2007 in respect of the differential impact of spectrum refarming. Equally significant is the fact that the deployment of 900 MHz infrastructure will take a considerable time to implement. The 16th recital to the Commission Decision provides: *"Differences in the national legacy situations could result in competitive distortions. The existing regulatory framework gives Member States the tools to deal with these problems in a proportionate, non-discriminatory and objective manner, subject to Community law including the Authorisation Directive and the Framework Directive."* H3GI agrees with the comment by ComReg that *"Option C has a greater potential to promote competition by providing applicants with no current presence in the band with the greatest opportunity to acquire 900 MHz spectrum which could be used shortly after the completion of the licence competition in 2009."* Finally, seven blocks of 5 MHz is the appropriate division of the available spectrum.

In relation to Option C:

1. H3GI believes that:

    a) At least one 2 x 5 MHz block should be reserved for new entrants; and

    b) If ComReg decides to reserve two 2 x 5 MHz blocks for new entrants, both blocks should be capable of being won by the one new entrant.

2. ComReg states: *"If there was one new entrant then Block A could be reserved and to ensure that a fair price was paid for that licence, the licence fee payable could, for example, be set as the average price of all other 900 MHz blocks awarded in the competition."*[22] H3GI does not agree with this illustrative approach. In relation to any block of 2 x 5 MHz of currently unallocated 900 MHz reserved for a new entrant, ComReg should determine an appropriate reserve price. The opportunity value of any block of 2 x 5 MHz of currently unallocated 900 MHz reserved for a new entrant will be less than any block of 2 x 5 MHz of 900 MHz available to an existing operator. In the absence of a 3G licence, a new entrant will not provide 2G services. As an exclusive provider of 3G services, H3GI does not intend to provide 2G services in Ireland. This is consistent with its group and historic approach, and the pending replacement of 2G by 3G technology.

3. H3GI agrees with the following comments by ComReg:

    a) *"Making available unused spectrum would increase efficiency in use of the 900 MHz Band"*;

[22] At page 43 of the Consultation Paper.

b) *"If Block A was to be reserved for new entrants, it would leave three contiguous 10 MHz blocks of spectrum in the rest of the band which could be bid upon by existing and potential operators."*;

c) *"By creating 5 MHz blocks of spectrum it would minimise the risk of creating isolated and unused blocks of spectrum"*;

d) *"Awarding all blocks in a single competitive process would assist applicants in acquiring spectrum blocks when and where they valued them most"*;

e) *"It would provide a high degree of visibility and certainty to both existing licensees and potential operators as the competitive award process would be completed by late 2009. All stakeholders would then be fully aware of the outcome of the licence competition well in advance of the expiry of the first 900 MHz licences in May 2011, and the third license in June 2015. This would allow existing licensees sufficient time to make appropriate plans regarding the expiry of their existing licences"*; and

f) *"Option C has a greater potential to promote competition by providing applicants with no current presence in the band with the greatest opportunity to acquire 900 MHz spectrum which could be used shortly after the completion of the licence competition in 2009."*[23]

In relation to Option B, H3GI agrees with the following comments by ComReg:

1. *"Making available unused spectrum would increase efficiency in use of the 900 MHz band"*;

2. *"It would create three contiguous 10 MHz blocks of spectrum which could be bid upon by existing and potential licensees"*;

3. *"By creating 5 MHz blocks of spectrum it would minimise the risk of creating isolated and unused blocks of spectrum"*;

4. *"Awarding all blocks in a single competitive process would facilitate applicants in acquiring spectrum blocks when and where they valued them most"*;

5. *"It would create a high degree of visibility and certainty to both existing licensees and potential operators as the competitive award process would be completed by late 2009. All parties would then be fully aware of the outcome of the licence competition well in advance of the expiry of the first 900 MHz licences in May 2011, and the third license in June 2015. This would allow existing licensees sufficient time to make appropriate plans regarding the expiry of their existing licences"*; and

[23] At page 46 of the Consultation Paper.

6. *"If new entrants acquire 900 MHz spectrum, then competition should increase and as a result consumers should benefit from increased choice, lower prices, better service and the earlier introduction of new products and services."*[24]

H3GI agrees with ComReg's intention to limit the total amount of 900 MHz spectrum that any operator would be permitted to gain spectrum rights to a maximum of 2 x 10 MHz.

Q. 14. Do you support Option B? Please provide supporting arguments with your answer.

Please see the answer to question 13 above.

Q. 15. Do you support Option C? Please provide supporting arguments with your answer.

Please see the answer to question 13 above.

Q. 16. If you agree with Option C, do you have views on the number of blocks that should be potentially reserved for new entrants? Please provide supporting arguments with your answer.

Please see the answer to question 13 above.

Q. 17. Do you believe there are other viable options that ComReg should consider? If so please explain these options in detail with supportive arguments.

Q. 18. Do you agree with ComReg's assessment that there is insufficient demand for 1800 MHz spectrum assignments to warrant holding a competitive award process at this time? Please provide supporting argument your answer.

If ComReg decides to permit use of the existing 2G licences for 3G purposes as soon as practicable following the coming into force of the Commission Decision, ComReg should grant H3GI equivalent 1800 MHz spectrum for 3G purposes, if requested.

Q. 19. Do you agree that the holding of a spectrum award process for 1800 MHz spectrum circa 2013 would be appropriate? Please provide supporting arguments with your answer.

Please see the answer to question 18 above.

Q. 20. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 1800 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Please see the answer to question 18 above.

[24] At page 42 of the Consultation Paper.

ANNEX 2

ANNEX III: Spectrum allocations and the capacity benefits from refarming

These are the spectrum allocations in each of the 3 Group EU operating countries and are provided for the purposes of calculating the capacity available to operators in each Member State.

Austria	3	Mobilkom	T-Mobile	One
GSM 900	-	2 x 10,4 MHz	2 x 12,8 MHz	-
GSM 1800	-	2 x 15,0 MHz	2 x 6,0 MHz	2 x 29,0 MHz
Total GSM	-	2 x 25,4 MHz	2 x 18,8 MHz	2 x 29,0 MHz
2.1 GHz FDD	2 x 14,8 MHz	2 x 14,8 MHz	2 x 15,0 MHz	2 x 14,8 MHz
2.1 GHz TDD	1 x 5,0 MHz	1 x 10,0 MHz	1 x 5,0 MHz	-

Denmark	3	TDC	Sonofon	Telia
GSM 900	-	2 x 9,0 MHz	2 x 9,0 MHz	2 x 14,8 MHz
GSM 1800	-	2 x 26,6 MHz	2 x 7,2 MHz	2 x 28,8 MHz
Total GSM	-	2 x 36,6 MHz	2 x 16,2 MHz	2 x 43,6 MHz
2.1 GHz FDD	2 x 15,0 MHz	2 x 15,0 MHz	2 x 15,0 MHz	2 x 15,0 MHz
2.1 GHz TDD	1 x 5,0 MHz	1 x 5,0 MHz	1 x 5,0 MHz	1 x 5,0 MHz

Ireland	3	Vodafone	O2	Meteor
GSM 900	-	2 x 7,5 MHz	2 x 7,5 MHz	2 x 7,5 MHz
GSM 1800	-	2 x 14,4 MHz	2 x 14,4 MHz	2 x 14,4 MHz
Total GSM	-	2 x 21,9 MHz	2 x 21,9 MHz	2 x 21,9 MHz
2.1 GHz FDD	2 x 15,0 MHz	2 x 15,0 MHz	2 x 15,0 MHz	-
2.1 GHz TDD	-	1 x 5,0 MHz	1 x 5,0 MHz	-

Italy	3	TIM	Vodafone	Wind
GSM 900	-	2 x 12,2 MHz (16 major cities)/ 2 x 10,2 MHz (elsewhere)	2 x 10.2 MHz (major cities)/ 2 x 9,0 MHz	2 x 4.8 MHz (major cities)/ 2 x 7.8 MHz
GSM 1800	-	2 x 15,0 MHz	2 x 15,0 MHz	2 x 20,0 MHz (major cities)/ 2 x 15,0 MHz
Total GSM	-	2 x 27,2 MHz (major cities)/ 2 x 25,2 MHz	2 x 25,2 MHz (major cities)/ 2 x 24,0 MHz	2 x 24,8 (major cities)/ 2 x 22,8 MHz
2.1 GHz FDD	2 x 15,0 MHz	2 x 10,0 MHz	2 x 10,0 MHz	2 x 10,0 MHz
2.1 GHz TDD	1 x 5,0 MHz	1 x 5,0 MHz	1 x 5,0 MHz	1 x 5,0 MHz

Sweden	3	Telia	Telenor	Tele2
GSM 900	-	2 x 7,2 MHz	2 x 7,2 MHz	2 x 7.2 MHz
GSM 1800	-	2 x 23,0 MHz	2 x 18,4 MHz	2 x 21,0 MHz
Total GSM	-	2 x 30,2 MHz	2 x 25,6 MHz	2 x 28,2 MHz
2.1 GHz FDD	2 x 15,0 MHz	2 x 15,0 MHz	2 x 15.0 MHz	-
2.1 GHz TDD	1 x 5,0 MHz	1 x 5,0 MHz	1 x 5.0 MHz	-

UK	3	Vodafone	O2	Orange	T-Mobile
GSM 900	-	2 x 17,2 MHz	2 x 17,2 MHz	-	-
GSM 1800	-	2 x 5,8 MHz	2 x 5,8 MHz	2 x 30,0 MHz	2 x 30,0 MHz
Total GSM	-	2 x 23,0 MHz	2 x 23,0 MHz	2 x 30,0 MHz	2 x 30,0 MHz
2.1 GHz FDD	2 x 14,6 MHz	2 x 14,8 MHz	2 x 10,0 MHz	2 x 10,0 MHz	2 x 10,0 MHz
2.1 GHz TDD	1 x 5,1 MHz	-	1 x 5,0 MHz	1 x 5,0 MHz	1 x 5,0 MHz

Taking the example of the spectrum allocations in the UK, it is possible to calculate the effective capacity that these allocations provide, and how that would change following refarming. The table below shows the capacity available to operators in the UK before and after refarming.

Illustrative capacity allocations before and after refarming				
	2G spectrum allocation	3G spectrum allocation	Capacity before refarming	Capacity after refarming
Vodafone	2 x 23.0 MHz	2 x 14.8 MHz	68	105
O2	2 x 23.0 MHz	2 x 10.0 MHz	53	90
Orange	2 x 30.0 MHz	2 x 10.0 MHz	60	120
T-Mobile	2 x 30.0 MHz	2 x 10.0 MHz	60	120
3	-	2 x 14.6 MHz	45	45

NOTES:

1. The table calculates capacity as the sum of the spectrum available for 2G use, added to the spectrum available for 3G use multiplied by a factor of 3. The factor of 3 is used because 3G provides about 3 times as much capacity from the same spectrum, due to its greater efficiency.
2. For the 3G capacity, the table assumes complete 5 MHz blocks and, after refarming, only includes complete 5 MHz blocks in the calculation of capacity (that is, it calculates Vodafone's and O2's capacity using 2 x 20 MHz rather than the 2 x 23 MHz of 900/ 1800 MHz spectrum that they actually have).

The example shows the current position, in which **3** UK has around 25% less capacity than its rivals. Following refarming **3** UK would have between 50% and 62% less capacity than its rivals.

Draft Commission Decision on the harmonisation of the 900 MHz and 1800 MHz frequency bands in the Community

1. It is vital that the harmonisation of the 900 MHz and 1800 MHz frequency bands (***GSM frequency bands***) is implemented by national regulatory authorities (***NRAs***) in a manner that is fair and non-discriminatory and does not distort or restrict competition. This paper is submitted on behalf of the **3** Group in Europe for consideration by the RSC in preparation of their Opinion on the draft Commission Decision on harmonisation of the GSM frequency bands (***Draft Decision***).

2. The **3** Group is part of the Hutchison Whampoa Limited telecommunications division, operating 3rd generation mobile telecommunications networks under the **3** brand in 6 EU Member States: Austria, Denmark, Ireland, Italy, Sweden and the UK. In just 3 years, the **3** Group has spent over €19 billion acquiring licences and rolling out its mobile broadband networks in these countries.

3. The views in this paper are in addition to previous submissions made by the **3** Group in relation to the 2.6 GHz band (***Expansion Band***). Decisions relating to the harmonisation of the GSM frequency bands are intimately tied to the resolution of issues surrounding the Expansion Band. If there is a failure to re-allocate and re-assign the GSM frequency bands on a non-discriminatory basis then a technologically neutral allocation of the Expansion Band will exacerbate the resulting distortion of competition in the 3G market.

Potential competitive distortions from refarming

4. To remove the limitations on the use of GSM frequency bands without any possible re-assignment of that spectrum would inevitably distort competition in the 3G market and would, in the **3** Group's view, be contrary to the Electronic Communications Directives and could possibly involve the grant of unlawful State aid to the 2G operators.

Additional capacity and its impact on competition

5. Spectrum is a key input for the provision of 3G services and is a finite resource. If refarming is allowed without restriction, it will provide existing 2G/3G operators (i.e. the incumbent 2G operators who also have 3G spectrum) with a significant amount of additional capacity and therefore a significant advantage. In other words, this would be providing spectrum for 3G use to the 2G/3G operators free of charge, whereas new entrant operators like the **3** Group had to pay considerable sums for similar spectrum. This competitive distortion would affect the **3** Group disproportionately because it is the only competitor in its markets that does not have its own 2G spectrum to refarm.

6. Simply allowing existing 2G/3G operators to refarm their GSM frequency bands would therefore result in an arbitrary and unfair change in the competitive landscape. This is the type of competitive distortion that must be avoided.

7. The GSM frequency bands must be re-assigned in a fair and non-discriminatory manner so that all 3G operators (including the new entrant 3G-only operators) have equal opportunities to access and use them. Equal rights to refarmed GSM frequency bands will ensure that competition between the mobile network operators is not distorted by historical allocations of the GSM frequency bands.

The 900 MHz frequency band and its impact on competition

8. As recognised in the Draft Decision, 900 MHz spectrum is particularly valuable for rural coverage due to its propagation characteristics which allow coverage of larger distances, and achieves better in-building penetration than higher frequencies such as 2.1 GHz. The better propagation characteristics of 900 MHz spectrum also provides greater flexibility in site location, and means that sites can be located adjacent to, rather than in, populated areas which involve greater planning difficulties.

9. The deployment of cell sites at 900 MHz in order to achieve coverage in rural areas would dramatically decrease the costs of network rollout in those areas. The resulting cell radii of sites at 900 MHz means that less base stations would be required. Depending on geography and population density, the **3** Group has estimated that there could be anything between 35% and 75% fewer base stations at 900 MHz than at 2.1 GHz. Also, having access to 1800 MHz spectrum can reduce the number of sites required for capacity (cell splitting) and therefore an operator can afford to deploy more sites for coverage rather than capacity.

10. In addition to the costs savings, access to the GSM frequency bands would allow operators to achieve a faster network deployment for both new coverage areas and in-fill coverage within its existing population coverage footprint.

11. If refarming is allowed without restriction, and 2G/3G operators have access to the GSM frequency bands for 3G use but new entrant 3G operators do not, such new 3G operators would either face significantly higher costs than their competitors to increase coverage, or have to compete with lesser 3G coverage placing them at a significant disadvantage in the market place.

12. It would be discriminatory against 3G-only operators with no 900 MHz spectrum, if they were not given equal opportunities to access and use this frequency band in order to achieve more economic network coverage in low density rural areas.

Issues under the Communications Directives

13. The Framework Directive (2002/21/EC) provides that NRAs shall promote competition by *inter alia* ensuring that there is no distortion or restriction of competition in the electronic communications sector and by encouraging efficient use and ensuring the effective management of radio frequencies (Article 8(2)). Article 9 provides that Member States shall ensure that the allocation and assignment of radio frequencies are based on objective, transparent, non-discriminatory and proportionate criteria.

14. Simply providing the option for existing 2G operators to use their GSM frequency bands for 3G services for free or otherwise without re-allocation in a transparent, fair and open manner would clearly discriminate against new entrant 3G operators like the **3** Group, which do not possess 2G spectrum. It would not be objective between incumbent and new entrant operators in mobile telephony. To assign and allocate spectrum in this way would be a breach of duty under the EC Treaty.

State aid

15. The right to use spectrum for the provision of 3G services is a resource provided by the State. Some Member States have already decided to charge a market price for the 3G spectrum at 2.1 GHz. To give away the right to use 2G spectrum for 3G services to only some operators is to subsidise them at the expense of the others in the market. It is a selective advantage that favours some operators over others, and one that is likely to have a distorting effect on competition, and an impact on trade between Member States. Therefore, it gives rise to a risk that there could be State aid implicit in a decision to allow refarming without giving all 3G operators access to 2G spectrum on equal terms.

Potential market concentration from refarming

16. As described above, 900 MHz spectrum is particularly valuable for rural coverage. If only some operators have access to 900 MHz, the cost advantage that they have may mean that only they will be able to offer 3G services in rural areas. This would reduce the number of competitors in those areas (for example, in Italy and the UK, to two) with the result that consumers in rural areas will have the choice of far fewer competitors than was planned for by regulators when awarding 3G spectrum. It is important to ensure that there will be sufficient operators with 900 MHz spectrum who are able and likely to roll-out 3G services in rural areas.

Refarming must be consistent with policy decisions already made and be proportionate

17. Community policy, as reflected in the UMTS Decision (128/1999/EC), was to maximise the likelihood of EU consumers receiving the next generation of mobile telephony services as early as possible, including in particular: the rapid introduction of UMTS networks and services in the EU (Article 1); UMTS coverage in less-populated areas (Article 4(2)); and the creation of a favourable climate for investment and deployment of UMTS with the widest possible territorial coverage (Recital 8).

18. If the 2G operators are simply allowed to refarm their GSM frequency bands without restriction, or in such a way that new entrant 3G operators do not have access to these bands on a fair and non-discriminatory basis, this would undermine the policy decisions and commitments made at the time of UMTS spectrum awards. Such an outcome would be disruptive of existing market expectations on which 3G investment has been based, and likely to cause distortion in the 3G market.

19. Departures from earlier policy decisions and the consequential disruption of market expectations themselves are negative consequences to be avoided or minimised if any decision is to be proportionate.

20. The approach to refarming must therefore be consistent with policy decisions and commitments made at the time of UMTS spectrum awards, and should not allow the circumvention of the original market rules devised specifically to promote the rapid roll-out of UMTS in the EU, to achieve the widest possible coverage and for the consumer benefit, nor have adverse effects on investment incentives.

21. As such, it is likely to be inconsistent to allow an operator to refarm spectrum for its own use prior to meeting its 3G spectrum licence roll-out requirements. If however refarming is to be implemented before one or more of the incumbent 2G operators has fulfilled its 3G roll-out requirements, then some compensating benefit may need to be accorded to those operators who have met their obligations.

22. It would also be discriminatory and unfair if, as a result of the way refarming is implemented in a Member State, new 3G operators were licensed without roll-out obligations. This would allow such persons to take advantage of the profitable urban markets without the cost of covering less densely populated areas.

23. Changes to regulatory policy must recognise and address what has gone on before. Where investments by operators are based on clear policy statements which subsequently prove to be unreliable, the value of the spectrum is diminished and the relevant business plans are undermined. This is not only a legacy issue, but impacts on decisions going forward. Not only will the current holder of the spectrum be reluctant to invest further, the resulting uncertainty will also impact on other potential investors' view of the viability of business plans and hence the value of the spectrum to them. Hence, undertakings will not acquire spectrum and/or will invest less if they perceive a significant risk that conditions on which it was acquired cannot be relied upon to continue.

24. Reneging on commitments will also impact on the credibility of future awards, making them inefficient. If the credibility of auctions is undermined by changing the 'rules' *ex post*, valuations in future auctions will also be undermined. Hence, future auctions may not result in the most efficient outcome, with an adverse effect on the economy.

Other implementation issues which could result in competitive distortions

25. Ensuring equal opportunity to bid for the GSM frequency bands needs to include a requirement that refarming will only be allowed once the released spectrum is available for use by the new user. Not to require this would provide a significant advantage to the 2G operator in terms of the timing of the availability of the new 3G spectrum and the ability actually to deploy the refarmed spectrum to deliver a service. In practice, in order to be able to use released spectrum on anything like equal terms with the other operators, new users will need significant advance warning of when the released spectrum will be available to it. This is required to ensure that there is both a suitable handset base and rolled-out network infrastructure which is capable of making use of the released GSM frequency bands once they are available.

26. The ways in which the released GSM frequency bands are re-assigned (eg. an agreed spectrum trade, the spectrum is returned to the NRA for auction and/or an administrative assignment) and priced will also be key to ensuring a competitive outcome is achieved at the end of the refarming process. For instance if there was an auction of only some of the released GSM frequency bands, there would be a significant toe-hold effect for the existing 2G operators. Furthermore, however assigned, in order to maintain and promote competition, new entrant 3G operators should not pay any more for the released GSM frequency bands than the 2G/3G operators pay for the right to re-use this spectrum.

27. In order to minimise any negative consequences from the refarming process, the principle of proportionality requires that there be a full assessment and balancing of the costs and benefits at the national level of any proposed refarming decision.

Conclusions

28. The NRAs must ensure that refarming is implemented in such a way that is consistent with policy decisions and commitments made at the time of the UMTS spectrum awards and that does not introduce new distortions to the already established yet fledgling 3G market.

29. The introduction of refarming must be on a fair and non-discriminatory basis so that all 3G operators have equal opportunities to access and use them. The ability to offer 3G services in the GSM frequency bands should not be implemented in such a way so as to provide a competitive advantage to some operators over others.

30. Furthermore, any new actions/policy decisions with respect to the previously established 3G market should aim to bolster competition in this market, as envisaged by the UMTS Decision and by Member States at the time of the national 3G assignments.

31. In light of the foregoing, we believe it is imperative that the Draft Decision includes:

- **an express recognition that NRAs must ensure refarming is introduced on a fair and non-discriminatory basis;**

- **an obligation on the NRAs to take account of the effects of refarming the GSM frequency bands on existing competition between mobile operators and for rectifying any distortions in the market caused by historical assignments; and**

- **given that the competitive effects will be realised at a national level, an obligation on NRAs to publicly consult on, and give reasons for, any decisions or other measures taken with respect to the refarming of the GSM frequency bands, similar to the obligation under Article 6 of the Framework Directive.**

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Non-confidential version

Differential Impact of Spectrum Refarming

Introduction

1. The Commission is assessing the likely impact of its draft Decision on the harmonization of the 900 MHz and 1800 MHz frequency bands (***GSM frequency bands***) and a draft Directive to repeal the GSM Directive. For this purpose, the Commission has requested the **3** Group to provide data showing the extent of its 3G network roll-out in Europe, and other relevant data to assist the Commission in analyzing the impact of allowing the GSM frequency bands to be used for 3G purposes (***refarming***).

2. The **3** Group is part of the Hutchison Whampoa Limited telecommunications division, operating 3G mobile telecommunications networks under the **3** brand in 6 EU Member States: Austria, Denmark, Ireland, Italy, Sweden and the UK. In just 3 years the **3** Group has spent over €19 billion acquiring licences and rolling out its mobile broadband networks in these countries.[1]

3. The views in this paper are in addition to the note submitted by the **3** Group to the RSC on 5 March 2007 for consideration alongside its Opinion on the draft Commission Decision (***RSC Note***). For ease of reference we enclose that note together with this paper. In summary, if refarming is to take place:

- It must be introduced on a fair and non-discriminatory basis so that all 3G operators have suitable opportunities to access and use the spectrum. To do otherwise would distort competition in the provision of 3G services, and would be contrary to the Electronic Communications Directives.

- In particular, refarming should not be implemented in such a way so as to provide a competitive advantage to some operators over others.

- NRAs must ensure that refarming is implemented in such a way that is consistent with policy decisions and commitments made at the time of the UMTS spectrum awards and that does not introduce new distortions to the already established yet fledgling 3G sector.

- NRAs must take account of the effects of refarming the GSM frequency bands on existing competition between mobile operators and for rectifying any distortions in the 3G market caused by historical spectrum assignments and deployment.

- NRAs must publicly consult on, and give reasons for, any decisions or other measures taken with respect to refarming the GSM frequency bands.

4. In response to the Commission's request for data, this paper describes below the current extent of the 3G network roll-out of the **3** Group in Europe, and assesses the differential impact of spectrum refarming as between 2G/3G operators and 3G-only operators.

5. It is quite clear that even if all 2G and 3G operators are provided the same amount of 900 MHz spectrum (and 1800 MHz spectrum for capacity), this will not produce the same benefits for each.

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[1] In addition, Hutchison Whampoa operates 3G networks in Australia, Israel and Hong Kong and has a licence in Norway.

6. In short, a decision to remove the current restrictions on the GSM frequency bands will grant value to the holders of that spectrum. The extent of the value granted will depend on the circumstances of each holder, and 2G/3G operators will derive much more value than 3G-only operators. This will distort competition and penalise those operators that have been innovative and have invested most in developing 3G.

7. In allowing refarming, NRAs must ensure that the competitive positions and investments which resulted from the original assignments of 3G spectrum are not undermined. 3G-only operators should receive a similar grant of value which may involve not only ensuring fair and non-discriminatory access to spectrum but also compensating 3G-only operators in other ways. The assessment of the competitive impact of refarming and of how to ensure fairness is one that will need to be made at the national level.

The 2.1 GHz frequency band remains essential for delivery of 3G services

8. When discussing the refarming of the GSM frequency bands for 3G purposes, it is instructive to recall that the 2.1 GHz frequency band was originally chosen because it was the only band with sufficient spectrum capacity available (or available to be cleared) to "*foster the development of a market with a broad competitive offering of mobile multimedia services*" across Europe (Recital 15 of the UMTS Decision).

9. Indeed, the 2.1GHz spectrum is the only frequency band currently available that offers sufficient capacity for high bandwidth mobile services in the urban areas which encompass a large proportion of most countries' populations. There is not sufficient 900 MHz spectrum available to provide the required capacity in urban areas (as demonstrated by the spectrum allocations shown in Annex III).

10. The 2.1 GHz band must continue to form an essential and significant part of any 3G operator's network if true mobile broadband in Europe is to be realised. All operators, whether or not they hold 900 MHz spectrum, will need to roll-out 3G services at 2.1 MHz to a large proportion of their population if they are to offer high bandwidth services. It would be wrong to assume that refarming of 900 MHz spectrum is necessary in order to achieve the roll-out of 3G services to the vast majority of EU citizens.

Extent of the 3 Group's 3G network roll-out

11. The **3** Group has spent over €9 billion in Europe in rolling-out its 3G networks at 2.1 GHz. It has achieved high levels of population coverage, as the table below shows.

	Number of cell sites	Population coverage
Austria (04/2007)	✂	67%
Denmark (03/2007)	✂	96%[1]
Ireland (03/2007)	✂	85%
Italy (03/2007)	✂	84%
Sweden (01/01/07)	✂	98.6%
UK (01/2007)	✂	90%

* Note that the **3** Group businesses are new businesses and are still rolling out their networks. They have existing commitments to install cell sites that will further increase

their coverage using 2.1 GHz. For example, **3** Austria is committed to further roll-out that will provide ✂ population coverage by the end of 2008 Q2, and **3** Ireland plans to have ✂ population coverage by the end of 2008.

[1] Calculated according to licence requirements.

12. The 3G coverage achieved to date by the **3** Group shows that it is possible to roll-out a 3G network that provides 90% population coverage at 2.1 GHz. As explained above, providing high bandwidth services to urban populations will, in any event, require the use of 2.1 GHz spectrum. The fact that many 2G/3G operators have not yet rolled-out their 3G networks to that extent has little to do with the economics of roll-out at 2.1 GHz but more to do with different incentives. An existing 2G/3G operator continues to derive substantial revenues from 2G and has little incentive to incur the costs of moving its customer base to 3G, and therefore little incentive to roll-out a 3G network.

13. One particular area where refarming of 900 MHz spectrum becomes important is in rolling-out beyond 90% population coverage and achieving greater geographic coverage in sparsely populated rural areas. The incremental revenues generated by additional 2.1 GHz sites in rural areas are unlikely to provide an adequate return on the investment in those sites.

14. As demonstrated in paragraphs 15 to 22 below, it is more economic to roll-out 3G services in rural areas using 900 MHz spectrum than 2.1 GHz spectrum.

Refarming will impact operators differentially

15. Whilst refarming the 900 MHz frequency band will be helpful to all 3G operators in achieving a more economic roll-out in rural areas (e.g. the last 10% of the population), 2G/3G operators will benefit more from refarming than 3G-only operators through:

- lower capital expenditure;
- lower operating expenditure;
- greater geographic coverage;
- greater capacity; and
- the ability to deliver more higher bandwidth services to more people.

Lower capital expenditure

16. One of the benefits of refarming is that fewer cell sites are needed at 900MHz than at 2.1 GHz to achieve the same 3G coverage; the higher the frequency, the smaller the geographic coverage of a cell, and, therefore, networks running at higher frequencies require more cell sites. A study by Ovum for the GSMA estimates that 900 MHz sites provide between 44% and 119% more geographic coverage than 2.1 GHz cell sites.[2] The **3** Group estimates that rolling out at 900 MHz could require anything between 35% and 75% fewer cell sites. This greater coverage means that a 900 MHz site would be commercially viable in certain rural areas where a 2.1 GHz cell site would not be.

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[2] Ovum report for GSMA, "Market Study for UMTS900", February 2007.

17. The extent of the cost savings from having to roll-out fewer cell sites will depend on the amount of additional 3G coverage required when refarming is permitted and, if an operator has 2G cell sites, the number of sites for which the existing infrastructure can be re-used for 3G purposes. The infrastructure in question refers to the site acquisition, foundations, tower, shelter for housing equipment, electricity supply, drainage, earthing, security fencing and backhaul transmission equipment.

18. An operator that has already rolled-out an extensive 3G network will derive much less benefit from the refarming of the 900 MHz frequency band than a 2G/3G operator that has more limited 3G coverage. This is largely because the potential for cost savings is less if the operator has already rolled out an extensive 3G network.

19. The benefit to 2G/3G operators is even greater than simply having to install the infrastructure at fewer cell sites. Whereas it might cost around €180,000 to locate, design and install a completely new base station and antenna and provide backhaul transmission, if there is an existing cell site the costs are much lower. In that case all that is required is a 3G Node B, which might cost around €80,000. In fact, in many cases it might be possible to re-use the existing antenna, subject only to some adjustments, at an even greater cost saving. Since the vast majority of pre-existing 900 MHz (and 1800 MHz) 2G cell sites will be suitable for 900 MHz (1800 MHz) 3G use, a 2G/3G operator with such a pre-existing 900 MHz (1800 MHz) network will be able to make considerable savings. The benefits of having an established 2G network are particularly pronounced in light of planning controls, which have become more restrictive over time, with the consequence that it is often easier to add additional antennae onto long-established masts than onto newer masts that typically have less flexible permissions.

20. Annex I provides the **3** Group's estimates of the number of sites required to provide different levels of population coverage. Annex II includes an illustrative calculation of the cost savings that different types of operators (3G-only, 900 MHz 2G/3G and 1800 MHz 2G/3G operator) would derive from 900 MHz refarming. The results are summarized in a chart showing the costs faced by the different types of operators in rolling-out a network to achieve 99% population coverage both with and without reframing. The illustrative calculation and chart show:

- Even without refarming 2G/3G operators benefit from lower costs to roll-out a 3G network through having an existing 2G network, due to the ability to re-use cell site infrastructure.

- Refarming benefits 2G/3G operators most because, having built out less at 2.1 GHz, they save more to achieve a given level of 3G population coverage. These savings come from needing fewer sites and from being able to re-use even more of their existing 2G cell site infrastructure.

- While refarming allows the 3G-only operator to save around 16% of its capital expenditure when building a full national network, the equivalent saving for a 2G/3G 900 MHz operator is over 60% and for an 1800 MHz 2G/3G operator around 50%.

- This results in the differential in roll-out costs between a 2G/3G and a 3G-only operator being far greater with refarming than without. A lower roll-out cost of 23 – 46% for the 2G/3G operator without refarming, becomes 65 – 68% with refarming. Refarming exacerbates the existing benefit to 2G/3G operators that comes from being able to re-use their existing 2G cell site infrastructure.

21. Compared to the situation of the **3** Group businesses in Europe, which have already invested in excess of €9 billion on network roll-out, a 2G/3G operator would be able to deploy 900 MHz in far more locations, thus reducing the number of sites it needs, and will be able to re-use existing 2G cell site infrastructure at an even greater saving in capital expenditure. Fewer cell sites at 900 MHz would also mean the need for fewer Radio Network Controllers and other network elements.

Lower operating expenditure

22. With fewer cell sites, ongoing operating expenditure will also be proportionately lower. This means that refarming would give operators that have yet to roll-out an extensive 3G network a permanent cost advantage over 3G-only operators. That would put 3G-only operators at a permanent competitive disadvantage, derived not through any inefficiency on the part of the 3G-only operators, but as a consequence of historical spectrum allocations and a change in government policy.

Greater geographic coverage

23. As demonstrated above, the ability to refarm 900 MHz spectrum would give 2G operators with this spectrum a significant advantage in rolling-out 3G coverage to remoter areas over 3G-only operators.

24. Having fewer cell sites to install and being able to re-use existing cell site infrastructure means that 2G/3G operators would be able to achieve faster network roll-out and better in-building coverage and therefore overtake quickly the level of coverage achieved by 3G-only operators. The 3G-only operators would lose the competitive advantage they have obtained by investing first and most heavily in the roll-out of 3G services.

25. Better rural and in-building coverage offers significant advantages to an operator. It means the operator can offer its services in places where its competitors cannot, providing more revenue opportunities. It also gives a superior network quality with fewer handover problems (dropped calls), leading to longer calls and better customer satisfaction. There is also a significant marketing advantage from offering coverage in more locations. The better the geographic coverage the more valuable is the network to customers. This translates into a greater willingness on the part of customers to pay for services, which in turn leads to lower customer acquisition and retention costs. In short, it provides a significant competitive advantage when competing for customers.

26. These commercial advantages are not transitory. If, as a consequence of refarming, a 3G-only operator were to get a reputation for having poorer network quality than its competitors, it would take considerable marketing effort and time to redress that perception, even once it had achieved the same network quality.

Greater capacity and the ability to deliver more higher bandwidth services to more people

27. If 2G/3G operators are able to refarm their 900 MHz and 1800 MHz frequency bands for 3G services without restriction, they will have a significant amount of additional capacity and therefore a significant advantage. Annex III summarises the spectrum allocations in the EU Member States in which the **3** Group operates. It also provides a model calculation that demonstrates, using the example of the UK, were refarming to take place without a re-allocation of spectrum, **3** UK (and 3G-only operators more generally) would have considerably less 3G

capacity than their 2G/3G rivals. In the case of **3** UK, its position changes from having 25% less capacity than its rivals to more than 50% less capacity. Since the amount of spectrum capacity determines the maximum revenues an operator can achieve, **3** UK would be put at a significant competitive disadvantage.

28. Changing the relative amounts of spectrum input available to the different operators would fundamentally changes the market dynamics and would do so to the disadvantage of the 3G-only operators. Increasing the number of carriers which an operator can deploy for 3G services provides a way of increasing the capacity available for relatively little capital outlay. Refarm would provide the existing 2G/3G operators with a significant amount of additional capacity.

29. Such additional capacity would have a fundamental effect on the way in which an operator can compete. This would directly affect competition for subscribers by giving 2G/3G operators the ability to support more customers, to offer tariffs with larger bundles of minutes and to offer more high bandwidth services.

Conclusion

30. It is possible to reach high levels of population coverage for 3G services using 2.1 GHz spectrum. In fact, all operators offering high bandwidth 3G services will eventually need to use 2.1 GHz for the urban areas that represent a high level of population coverage.

31. Providing the 98% - 99% population coverage and the geographic coverage of the GSM networks is not commercially viable at 2.1 GHz. 900 MHz spectrum will be required to provide that coverage.

32. Refarming, even with a re-assignment of spectrum, could fundamentally change the market dynamics. It could put 3G-only operators at a significant competitive disadvantage compared to 2G/3G operators with existing 2G networks and lower 3G coverage. The loss of competitive advantage would not be through any fault of their own but would be a consequence of historical spectrum allocations and a change in government policy.

33. It would be perverse if refarming were to penalize those operators that have been the most enterprising and have invested most and done most to stimulate the 3G market, and to reward operators that have held back. This would be a poor signal for future entrepreneurial endeavors.

34. To avoid competitive distortions through refarming it will be necessary to ensure that all operators have access to spectrum providing equal opportunities for coverage and capacity. This will not, in itself, be sufficient. 3G-only operators have led the roll-out of 3G networks and invested heavily in developing new services. They have done that using the only spectrum available to them – 2.1 GHz. Granting other operators the right to use spectrum that allows them to build competing networks more quickly and at lower cost, and to exploit advantages they have from their established 2G networks, would change the whole dynamics of competition between 3G operators to the detriment of the 3G-only operators.

35. In light of the foregoing, and to reiterate our request set out in the RSC Note, it is imperative that the Decision includes:

- **an express recognition that NRAs must ensure refarming is introduced on a fair and non-discriminatory basis;**

- **an obligation on the NRAs to take account of the effects of refarming the GSM frequency bands on existing competition between mobile operators and for rectifying any distortions in the market caused by historical assignments; and**

- **given that the competitive effects will be realised at a national level, an obligation on NRAs to publicly consult on, and give reasons for, any decisions or other measures taken with respect to the refarming of the GSM frequency bands, similar to the obligation under Article 6 of the Framework Directive.**

30 March 2007

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3 Imagine Communications

LIBERALISING THE USE OF 900MHz AND 1800MHz SPECTRUM BANDS

IMAGINE COMMUNICATIONS RESPONSE TO THE CONSULTATION

Q. 1. Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions? Please provide supporting arguments with your answer.

Yes. Imagine agrees with this proposal. Mobile spectrum liberalisation holds the potential for substantial consumer benefits through the more efficient use of technology to provide mobile communications services and/or the introduction of new competition into the market. The benefits of this liberalisation can be best achieved by ensuring tha the spectrum is awarded to new market entrants and not just to existing mobile operators.

Q. 2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Imagine agrees with the principle of service neutrality for this spectrum award. This regime should support the development of additional or innovative services to the market and not just bolster the spectrum assets of existing operators.

Q. 3. Do you agree that a review of the annual licence fees is appropriate at this time to determine whether or not these fees should be adjusted to take into account the increased value associated with liberalised 900 MHz licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Imagine does not necessarily agree that liberalising the spectrum will result in significant cost reductions for incumbent operators. Therefore, an increase in the licence fees may not be justified. However, any review of licence fees should be done in such a manner that does not put new entrants using this spectrum at a disadvantage and should ensure that equivalent costs per MHz are paid by new and existing operators. The benefits of spectrum liberalisation are not achieved by the amount someone is prepared to pay to aquire spectrum. Part of the award process should test the intent of any alternative bidders to bring competition and increased value to the market. The price of the spectrum and ongoing fees should take this into account.

Q. 4. Do you agree with ComReg's proposal that an auction mechanism is the most appropriate format for granting future 900 MHz spectrum licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Imagine does not agree that an auction mechamism should be used to award this spectrum. Rather the award process should be designed to ensure that the spectrum is awarded to bidders that will bring enhanced competition and value to the market.

Imagine would support the use of either auction or beauty contest for award of this spectrum with the condition that existing 900MHz and 1800MHz holders would not be able to acquire the newly released spectrum.

Q. 5. Do you agree with ComReg's proposal to place a cap of 2 × 10 MHz on the amount of spectrum that any one licensee can hold in this band? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Any new market entrant in this band should not be disadvantaged through lack of spectrum compared to the existing operators. On this basis the maximum spectrum allowable per operator (assuming one additional new entrant in the band) should be a quarter of the available spectrum, or 2 x 8.75MHz.

Q. 6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Imagine agrees with the principle of service neutrality for this spectrum award.

Q. 7. In the absence of spectrum trading, what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.

Licences should be awarded for a minimum period of fifteen years in orde to provide sufficient time for adequate capital return.

Q. 8. Do you agree with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band? Please provide supporting arguments with your answer.

Imagine agrees with the principle of having a common termination date.

Q. 9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences? Please provide supporting arguments with your answer.

Yes. Imagine agrees that MVNO should be an obligation for future 900MHz licences. However, in order to be meaningful any such additional obligation needs to be enforceable by ComReg with pre-determined criteria including commercial considerations and defined timeline.

Q. 10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

Imagine agrees with the principle of technology neutrality for this spectrum award.

Q. 11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

A minimum block size of 5MHz is acceptable.

Q. 12. Do you agree with ComReg's frequency co-ordination and interference

mitigation proposal in the 900 MHz bands in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Imagine agrees with this approach.

Q. 13. Do you support Option A? Please provide supporting arguments with your answer.

No. Imagine is in favour of option C which reserves spectrum for new entrants.

Q. 14. Do you support Option B? Please provide supporting arguments with your answer.

No. Imagine is in favour of option C which reserves spectrum for new entrants.

Q. 15. Do you support Option C? Please provide supporting arguments with your answer.

Imagine is in favour of Option C. This option maximises the potential for new entrants to enter the market thereby ensuring that competition is promoted by this spectrum reallocation.[re-iterate the pro-competition point in each response for q13-q17]

Q. 16. If you agree with Option C, do you have views on the number of blocks that should be potentially reserved for new entrants? Please provide supporting arguments with your answer.

Two blocks should be reserved for new entrants. This is to maximise the potential for successful market entry by a new operator.

Q. 17. Do you believe there are other viable options that ComReg should consider? If so please explain these options in detail with supportive arguments.

Imagine agrees with option C above.

Q. 18. Do you agree with ComReg's assessment that there is insufficient demand for 1800 MHz spectrum assignments to warrant holding a competitive award process at this time? Please provide supporting argument your answer.

Imagine agrees with this position.

Q. 19. Do you agree that the holding of a spectrum award process for 1800 MHz spectrum circa 2013 would be appropriate? Please provide supporting arguments with your answer.

Imagine agrees that this timeline is appropriate at the current time.

Q. 20. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 1800 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Imagine agrees with this position.

4 LM Ericsson

Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands

Ericsson's Response to ComReg Consultation Document 08/57

September 2008

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1. General comments

LM Ericsson ("Ericsson") welcomes the opportunity to comment on ComReg's consultation Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands 08/57.

Ericsson shares ComReg's view as to the strategic importance of the radio spectrum as a national asset. Spectrum has an increasingly important role to play in the development of new technologies and services and we are approaching a time of major opportunities of significant national importance in this respect. These opportunities demand a measured and appropriate policy response in terms of spectrum licensing as well as co-operation within the industry (while still ensuring that competition is maximised) if the maximum benefits of this opportunity are to be realised in Ireland.

Speedy and appropriately-framed liberalisation of the 2G spectrum is a prerequisite for the deployment of new mobile broadband services and we would urge ComReg and indeed the wider industry to move ahead as rapidly as possible in this area. We recognise there are significant challenges and risks for incumbent operators who have invested billions in Ireland's telecommunications infrastructure and the potential for severe disruption should the liberalisation process not run smoothly. In these economically challenging times, we would urge ComReg to be extremely cautious in how the spectrum is liberalised.

Investment in infrastructure during the high growth period we have witnessed over the last 20 years has been driven by business and industry growth. However, in the current economic climate the need for 'big picture' thinking, combined with stability and secure investment in our telecoms infrastructure are vital for our economic and social development as a modern knowledge-based and environmentally sustainable economy. Both incumbents and any potential new entrants face significant challenges in raising investment in the current environment. Ericsson is of the view that a greater level of discussion, understanding and co-operation between Government, ComReg and industry players will be necessary if we are to realise the sort of competitive telecommunications infrastructure with wide geographical and demographical availability of advanced communication services that we need to compete as a modern knowledge-based and environmentally sustainable economy.

2. New Technologies

While the initial benefit of the liberalisation is likely to be realised with 3G/HSPA, the liberalisation of the 2G spectrum should be cognisant of industry trends and standards developments work such as WiMAX, LTE and LTE-Advanced so that the

approach gives industry a clear and future-proofed investment opportunity. The future use of the 900 and 1800 MHz spectrum is an important issue in the context of 3GPP standards and 4G Long-Term Evolution (LTE and LTE-Advanced) , given the requirements of wider channel widths of 10, 20 and even 40 MHz channel requirements that could feasibly be made in this band.

While the developing economics of the telecommunications business is driving operators to share infrastructure on an ever increasing basis, technological changes in terms of optimal channel bandwidths are also likely to lead to more shared resources. To this end, regardless of how the liberalisation eventually occurs, Ericsson would urge ComReg to allow for the utmost flexibility in spectrum co-ordination, spectrum swapping and even spectrum sharing in the future license conditions.

2. Spectrum Licensing and Allocation

The liberalisation of the GSM spectrum presents ComReg with an important opportunity to facilitate and encourage the deployment of high-speed mobile broadband services on a ***nationwide*** basis similar to GSM. In particular the 900MHz band with its excellent propagation characteristics has the potential to greatly reduce both the fixed and mobile digital divide as well as greatly enhancing indoor coverage and throughput in urban and suburban environments. We believe that it is vital – given the significant societal and economic benefits arising from such network deployment – that the licensing and allocation is done in a way that in the long run delivers the best economic and social return possible to the Irish people.

Spectrum sub 1GHz is one of our most valuable natural resources and as such has the potential to deliver the greatest benefit to society. Ericsson agrees with ComReg with regard to making a pre-condition of the reallocation of the 2G spectrum and the reassignment of any unused 900 MHz spectrum that this spectrum is utilised for the deployment of nationwide mobile broadband networks providing coverage at least equal to that of GSM. Experience from the deployment of existing 2G and 3G networks shows that maximum take-up of services and, hence, benefits from the use of these services derive to customers, operators and the wider economy only where there is nationwide deployment.

The trend in which spectrum usage rights are assigned is moving away from the previous “beauty contest” approach to more flexible methods based predominantly (though not exclusively) on auctions. ComReg itself has already begun to move in the same direction, with the use of first-come-first-served assignments and sealed bid auctions (including a Sealed Bid Combinatorial auction for assignments in the 26 GHz band). While differing methodologies have their advantages, a pure economic model that does not take account of social and longer term economic benefit should be avoided.

Going forward, Ericsson believes that ComReg’s approach may tend to mirror that of other spectrum licensing agencies and that; as a result, the trend towards auctioning spectrum may become more pronounced, as will the enabling of secondary trading of spectrum assignments. However, such a shift in the way spectrum is assigned should be carefully balanced with public policy objectives in relation to how licensed spectrum is utilised. The current government has been very clear with regard to the

policy objectives of achieving ubiquitous broadband in Ireland and the liberalisation of the GSM spectrum can have a tremendous positive impact on this policy objective.

2. Answers to Questions

Q. 1. Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions? Please provide supporting arguments with your answer.

YES. As ComReg points out in its Consultation Paper, there are a number of international developments – both at EU level and within CEPT – which are driving the liberalisation of the 900 MHz and 1800 MHz bands. It is also the case, as ComReg states, that there are potentially significant benefits to be derived by Irish consumers and businesses from the liberalisation of the two spectrum bands. In particular, the move should ensure the widespread deployment of 3G HSPA or later LTE services in the existing 2G bands. Such a development should mean mobile broadband services are available on a nationwide basis and that customers should experience enhanced quality of service, especially in rural areas and in relation to in-building coverage.

Q. 2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

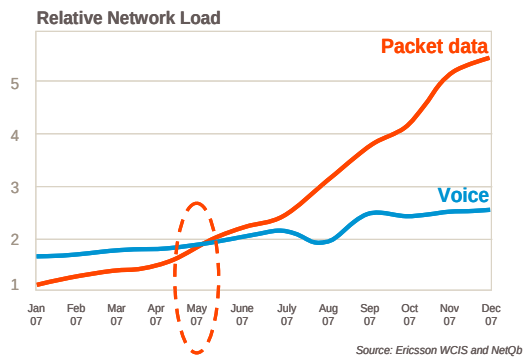
YES. ComReg's proposal to implement a service-neutral licensing regime for existing 2G spectrum assignments is a sensible, forward-looking one, which, as ComReg points out, takes into account the principles of WAPECS and the draft WAPECS Recommendation. Operators are best placed to take appropriate decisions on the evolution of their networks in light of significant traffic shifts and the increasing importance to them of mobile broadband services. A service-neutral licensing environment would allow the operators to do this.

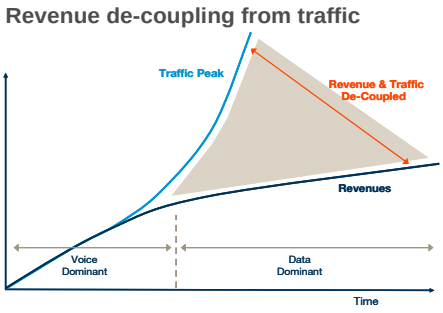
Q. 3. Do you agree that a review of the annual licence fees is appropriate at this time to determine whether or not these fees should be adjusted to take into account the increased value associated with liberalised 900 MHz licences? Please

provide supporting arguments with your answer and suggest a detailed alternative if applicable.

POSSIBLY. ComReg claims that "a strong argument" can be made that liberalisation will increase the value of existing 2G spectrum assignments and, on this basis, proposes a review of current annual licence fees. However it would not be unreasonable to make the argument that the spectrum in Ireland may in fact be worth less considering the following arguments:

- There is plenty of evidence that operators' business models are undergoing massive change and that revenues and profitability are falling. In the past, growth in traffic has been closely aligned with growth in revenue and profitability. However with the advent of broadband and bundled minutes and texts this is no longer the case. Traffic and costs are continuing to grow rapidly while ARPUs are declining. This is creating a very challenging environment for infrastructure investment. The following graphs illustrate the trends.





- The globalisation of the industry means that Ireland is competing for investment with markets that are developing and are yielding a higher return on investment. It is getting increasingly difficult for incumbents in developed markets to raise the capital for infrastructure investment when greater returns can be made in developing markets.
- Currently Ireland is in recession and economic indicators are less positive than other markets. This coupled with the rising cost of finance will make the business case for telecoms infrastructure much harder which in turn will impact the value of spectrum.
- More harmonised spectrum is becoming available. Over the next few years more spectrum will be made available to the market e.g. 2.3GHz, 2.5GHz and the UHF spectrum freed up by the transition from analogue to digital TV (digital dividend). This additional spectrum will likely decrease the value of existing spectrum allocations.
- Last but not least, as ComReg itself concedes, it is likely to be some time before the existing licensees benefit from spectrum liberalisation and, in this regard, ComReg cites the need to meet ongoing 2G licence obligations and the

need to facilitate customers' transition to 3G-enabled handsets. To achieve this it is, of course, also the case that operators will need to invest heavily in the deployment of 3G technologies within the 900 MHz and 1800 MHz band and it is likely to be some time before operators will see any return on this investment.

As a result, it is, in our opinion, premature for ComReg to seek to increase annual licence fees for this spectrum at this point in time.

Q. 4. Do you agree with ComReg's proposal that an auction mechanism is the most appropriate format for granting future 900 MHz spectrum licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes, if very well designed. It is difficult to say with any accuracy which is the 'best' way to allocate spectrum. While it is now well accepted, both in theory and at a practical level, that an auction is a more transparent way to allocate spectrum than an administrative process or "beauty contest" it is does not mean that the maximum social and economic benefit will accrue for society as a whole which is obviously the aim of any government and regulatory body. Auctions tend to be highly efficient, speedy, extremely transparent and have low participation costs. However, auction failure (no bid), prices over-inflated by hype or bad auction design, spectrum hoarding, price gaming are all some of the potential downsides of an auction process.

Well designed beauty contests have had great results to date in terms of the success of GSM. The downside being that beauty contests are often slow, potentially wasteful of resources, sometimes lacking in transparency and sometimes open to legal challenge.

Ericsson would support a well-designed auction, with conditions on use that are aligned with public policy and that avoids the negatives of an auction process as outlined above as much as possible.

In opting for an auction for future assignments in the 900 MHz band, it is obviously of great importance that ComReg adopts an appropriate design such that the social and economic benefit for society will be maximised. There are a number of different auction formats that might be used to allocate this spectrum and we would expect ComReg to consult publicly on its proposed auction format, as well as its proposed detailed auction rules, before taking any definitive decisions on the issue.

What about the issue of timing or any auction or beauty contest ? Last time round they waited too long and lost out in cash terms and in terms of operator interest.

Q. 5. Do you agree with ComReg's proposal to place a cap of 2 x 10 MHz on the amount of spectrum that any one licensee can hold in this band? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

YES. It is clearly justifiable for ComReg to place some kind of cap on the available spectrum, to ensure that no one operator is able to secure a disproportionate amount of this scarce resource. The question then becomes one of what is the maximum amount of spectrum that any operator should hold in the 900 MHz band and should this cap be indefinite? Given the need to support the provision of voice, text and broadband services within the allocation granted, ComReg's proposal of a 2 x 10 MHz cap seems like a sensible and practical one. However this should be open to review in the context of the digital dividend and new legislation that may allow for spectrum trading.

What about network sharing and/or pooling of spectrum ?

Q. 6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

YES. If ComReg plans to implement service-neutrality in relation to the existing 900 MHz allocations (a move we support – see our response to Q2 above), then it obviously makes sense for the same principle to apply in relation to future spectrum assignments within the band.

Q. 7. In the absence of spectrum trading, what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.

As ComReg points out, it is important that the duration of future licences in the 900 MHz band is sufficiently long to enable operators to recoup the cost of deploying nationwide networks. The investment involved in deploying HSPA within the 900 MHz band on a nationwide basis will be considerable and any such investment is likely to be risky, given its scale and the significant competition that exists in many parts of the broadband market and the economic arguments already outlined in our response to Q.3. For this reason, operators who secure 900 MHz assignments must be given adequate time to make a return on their investments and so the licences should endure till at least the end of the 3G licences with the flexibility to be become indefinite tradable assets once the legislation is in place to allow spectrum trading.

Q. 8. Do you agree with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band? Please provide supporting arguments with your answer.

Possibly, but it needs careful consideration. Common termination dates would obviously be much more convenient from an administrative point of view, especially when dealing with future licence assignments within the 900 MHz band. However in light of likely future legislation with regard to spectrum trading and indefinite tradable licenses, as per the response above it may make more sense to create a common termination date by extending the existing 2G licences. For example extending the 2G licenses held by Vodafone, O2 and Meteor to the end of the 3G license period. In this way, the existing operators can avail of spectrum liberalisation earlier than would otherwise have been the case and the disadvantages from operators gaining access to new 900 MHz spectrum assignments on a staggered basis over the period 2011 to 2015 would be avoided. In light of the economic challenges outlined in Q.3. This may very well yield the best social and economic result for Ireland.

Q. 9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences? Please provide supporting arguments with your answer.

NO. ComReg should not use the licensing process to pursue unrelated regulatory goals. Regulated MVNO access should only be considered following a market review of the relevant market undertaken in accordance with the prevailing EU-wide regulatory framework. If such a market review (of the market for wholesale access and call origination) results in findings of market power, ComReg is then entitled to submit its findings to the European Commission (under the so-called "Article 7 procedures") and, if the Commission raises no objections, to impose appropriate remedies – which could include MVNO access – on those operators which have been designated with SMP.

It would be inappropriate for ComReg to attempt to side-step the existing regulatory framework in this way and it would be completely disproportionate for it to impose ex ante regulatory obligations on operators without first determining whether or not those operators possess market power. It is, indeed, very likely that any such plans would be in conflict with the existing regulatory framework and that ComReg would run into legal difficulties in attempting to impose such an obligation as part of the licensing process. In light of ComReg's own view that the liberalisation of this spectrum should happen as soon as possible the risk of liberalisation being tied up in any legal battle should be avoided.

Q. 10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

No. Ericsson agrees that deviations from a general principle of technology neutrality should be made only in justified cases. Services providing pan-European operations to a majority of the EU population and businesses that are strongly dependent on interoperability and economies of scale to provide such services at affordable prices are clearly such justified cases.

Harmonised spectrum arrangements and coordinated regulatory conditions are cornerstones for affordable and ubiquitous mobile communications services for consumers based on efficient spectrum use and economies of scale. Spectrum policy should allow markets to balance between efficiency and flexibility.

A policy providing the freedom to use "any technology" is clearly a reversal from the previous European strategy to create pan-European markets. Although no technology should be discriminated against in the consensus process leading to European or international standards, the benefits of standardisation as expressed in the Framework Directive are still valid and should be preserved. A divergence from the existing policy of promoting standardisation can lead to fragmentation in the market place and reduce the cohesion of the single market.

Q. 11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes. 5MHz seems a reasonable minimum spectrum block size, assuming that the channel arrangement within any blocks that an operator is assigned in a licence will allow for flexibility e.g. channel widths can bee 200KHz as per GSM up to 10MHz as per LTE (assuming 5 adjacent 5MHz blocks).

Q. 12. Do you agree with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes. However, to support the most efficient use of spectrum and in light of technological and economic developments and trends we believe it would be beneficial if ComReg were to allow spectrum usage to be as flexible as possible within the constraints of competition law in Ireland and Europe. To that end we believe that spectrum co-ordination up to and including swapping of blocks between

operators (similar to what happens in GSM currently) and spectrum aggregation and sharing (e.g. combining one or more operators blocks to allow for wider more efficient channels/technologies) should be allowed for within the liberalised licences.

Q. 13. Do you support Option A? Please provide supporting arguments with your answer.

No. An award process comprising three separate auctions over a four-year period would involve, as ComReg admits, considerable uncertainty for bidders and would be unlikely to result in an efficient assignment outcome. As ComReg itself also concedes, this option would be unlikely to produce an outcome whereby three operators are able to obtain contiguous 2 x 10 MHz spectrum blocks. This licence award option would, as ComReg notes, be likely to hamper the deployment of new technologies in the 900 MHz band and delay the benefits of liberalisation for consumers.

Q. 14. Do you support Option B? Please provide supporting arguments with your answer.

NO. Although the option of holding a single licence award process makes sense, we do not support ComReg's plan to make the new spectrum assignments available to successful applicants on a staggered basis, depending on when the existing 2G licences expire. Such an approach could lead to enormous uncertainty and operational difficulties for the existing operators utilizing 900 MHz spectrum who, between them, provide mobile services to 4.9 million customers.[1] Under ComReg's proposals, there is every possibility that an operator could lose its entitlement to use its existing 900 MHz allocation either permanently, or when their 2G licence expires and then not be granted access to its new allocation until 2015. ComReg's notion that such operational upheaval could be catered for by the conclusion of short-term MVNO agreements or utilisation of 'other spectrum' allocations is neither realistic nor credible. While it is obvious operators would have strong commercial incentives to ensure minimum disruption to their customer base it would seem to indicate a lack of understanding in ComReg of the technical, financial and practical challenges associated with moving millions of subscribers in potentially a very short time frame. In additional it sends a message to potential investors in the market that even if they have invested millions in Ireland building a sustainable business it can all be substantially undermined in a very short time frame. This would undoubtedly irreparably damage future investment in telecoms in Ireland.

[1] According to ComReg's latest quarterly report (ComReg Document 08/75), there are currently 5.2 million mobile subscriptions, of which 5.4% are accounted by the 3G operator 3. This means that the remaining 4.9 million subscriptions are serviced by the other three 2G/3G providers.

Q. 15. Do you support Option C? Please provide supporting arguments with your answer.

No. There are currently four network operators providing mobile services in Ireland and it is transparently the case that consumers are now reaping significant benefits from the strong competition that is taking place amongst the four providers. Latterly, these operators have also begun to compete strongly in the adjacent market for broadband services and their entry into this market segment has had the effect of significantly boosting competitive activity in this area as well.

Seen in this light, it is difficult to understand why ComReg might want to reserve any of the 900 MHz spectrum on offer for a new entrant. We note the analysis that ComReg has carried out (in Appendix F attached to the Consultation Paper) but our observation would be that this analysis is not as comprehensive as it might be and so could there is a danger that incorrect conclusions would be drawn. It does not, for example, consider the likely significant negative change in consumer surplus arising from the exit of an existing player and instead focuses exclusively on the possible positive impact on consumer surplus arising from increased market entry. Likewise, the difficulties that a new entrant would face in attempting to roll out a fifth nationwide network and in establishing itself in an extremely competitive environment do not appear to have been considered within ComReg's analysis.

In addition, there appears to be some confusion in ComReg's proposals as regards what it means by "new market entry". In its Appendix F analysis, it seems obvious that ComReg is talking about an entirely new mobile market player – given that the allocation of different spectrum assignments to existing mobile market players could not be construed as "new market entry" – whereas, in paragraph 8.6, ComReg discusses the merit of reserving spectrum "for new entrants to the 900 MHz band" and then points to its Appendix F analysis to highlight the positive welfare effects arising from new market entry. However, if spectrum is reserved for entrants to the 900 MHz band, then one of the existing mobile players (the 3G-only operator, 3) would be eligible to apply for any such assignment and, given its position as an existing market player, would be highly likely to win this assignment. Were this to happen, little if any of the putative welfare effects claimed by ComReg in its Appendix F analysis would be realised.

Moreover, the reservation of any more than one spectrum block for a new entrant (regardless of how such an entrant is defined) would make it impossible for the existing 900 MHz players to obtain three contiguous 2 x 10 MHz spectrum blocks. As we have already noted, these operators currently provide mobile services to 4.9 million customers and it could be argued disproportionate and anti-consumer to prevent these operators from obtaining all the 900 MHz spectrum they require (up to the cap which ComReg proposes to set – see Q5 above) in order to continue providing services to these customers.

If spectrum is to be reserved for any operators it surely would make more sense to try and insure the minimum disruption to the 4.9 million existing consumers and to send a positive message to investors and operators who have invested so much in the

telecoms infrastructure in Ireland. To that end each existing 900MHz operator should have at least one 5MHz block reserved to cater for its existing 2G subscriber base.

Q. 16. If you agree with Option C, do you have views on the number of blocks that should be potentially reserved for new entrants? Please provide supporting arguments with your answer.

As per our response to Q.15.

Q. 17. Do you believe there are other viable options that ComReg should consider? If so please explain these options in detail with supportive arguments.

We believe that a variant of Option B, involving a single auction in 2009 should be considered, but that this should be combined with:

- a decision to reserve at least a 5MHz block for each of the existing 2G operators, and
- a decision to extend the existing 2G assignments to the end of the 3G license period.

This option would be a very balanced approach with the significant advantage whereby any negative impact on consumers would be minimised, the existing operators would be encouraged to invest and there would still be up to four 5MHz blocks available to existing and new operators to compete for. If economic analysis conclusively showed that a new entrant would have a positive effect then one 5MHz block could also be reserved for a new entrant.

Q. 18. Do you agree with ComReg's assessment that there is insufficient demand for 1800 MHz spectrum assignments to warrant holding a competitive award process at this time? Please provide supporting argument your answer.

No. We believe that the 1800MHz spectrum provides an opportunity for the introduction of LTE and that it would be most prudent and efficient to have an award process for 1800MHz at the same time and in so doing provide greater certainty in the market.

Q. 19. Do you agree that the holding of a spectrum award process for 1800 MHz spectrum circa 2013 would be appropriate? Please provide supporting arguments with your answer.

No. Please see response to Q.18.

Q. 20. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 1800 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes. 5MHz seems a reasonable minimum spectrum block size, assuming that the channel arrangement within any blocks that an operator is assigned in a licence will allow for flexibility e.g. channel widths can be 200KHz as per GSM up to 10MHz as per LTE (assuming 5 adjacent 5MHz blocks).

5 Meteor Mobile Communications Ltd

Meteor Mobile Communications Ltd.

Response to ComReg Doc. No: 08/57

Consultation on

Liberalising the use of the 900 and 1800 MHz Bands - Liberalisation of the GSM Spectrum Bands & Options for Release of Spectrum in these Bands

30th September 2008

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Meteor Mobile Communications Ltd

Response to ComReg 08/57

A. Executive Summary

ComReg's Liberalisation Proposal

Meteor welcomes ComReg's proposal to liberalise use of the 900 MHz and 1800 MHz frequency bands in accordance with the anticipated entry into force of a binding European Commission decision on harmonisation of these bands ("Draft Liberalisation Decision"). Meteor supports the opening of the 900 MHz and 1800 MHz bands for UMTS use. As a legal and policy matter, ComReg should take the steps necessary to open these bands for UMTS use as soon as possible.

In principle, Meteor supports the opening of the 900 MHz and 1800 MHz bands on a service- and technology-neutral basis. However, adequate technical investigations must first be completed on a case-by-case basis and appropriate parameters established by the relevant testing and standards bodies (as has already been done for UMTS) in order to ensure that any additional systems will not interfere with the provision of GSM and 3G services in urban, suburban and rural areas. Meteor therefore urges ComReg to liberalise the 900 MHz and 1800 MHz bands in a harmonised fashion following EU developments and allow only those technologies that are approved by CEPT and identified in the annex to the Liberalisation Decision (as it may be updated from time to time).

ComReg's Proposals for Compulsory Release and Auction of the 900 MHz Spectrum

ComReg appears to be using the anticipated entry into force of the Draft Liberalisation Decision as the springboard for an extraordinary and unprecedented intervention in the mobile sector. The consultation document proposes three options that would require full release and reassignment of the 900 MHz spectrum blocks that are currently licensed to Meteor, O2 and Vodafone. This is a radical proposal that could require the existing licensees to relinquish all of the spectrum which they currently use in the 900 MHz band upon the expiry of their licences (2011 in the case of Vodafone and 02, and 2015 in Meteor's case). ComReg's proposal is to repackage the spectrum, put it up for auction and re-assign it – potentially displacing some or all of the existing licence holders.

The Draft Liberalisation Decision, however, does not link liberalisation of the spectrum with compulsory release of the 900 MHz spectrum blocks that are being utilised by existing licensees. Indeed, the explanatory note to the Draft Liberalisation Decision makes clear that the measure does not address the issue of spectrum usage rights. On the contrary, it exhorts national regulators to ensure that liberalisation of the band does not disrupt the current use of GSM services in the 900 MHz band given the "high importance of GSM services for electronic communications policy in the European Community."[1]

Each of the options proposed by ComReg has the potential to cause serious disruptions in the provision of mobile services to Irish consumers. Indeed, because

[1] COM(2007)367 final, at pp. 2, 3, 8 (25.7.2007)

the proposals disregard the legitimate expectations and interests of the existing licensees, the proposals are themselves a source of regulatory uncertainty that could have a chilling effect on investment and service development planning by existing licensees. The prospect of continuing to invest in a business whose principal input could be abruptly lost at auction in the near or medium term is not one that resonates favourably with investors, particularly in the current economic climate. No other regulatory authority in Europe – or anywhere else in the democratic world of which Meteor is aware – has applied such a draconian regime to existing licence holders in anticipation of the expiry of similar licences while the assigned spectrum was still in use for a viable and important business purpose (absent a finding of material breach of the licence).

ComReg's proposals are predicated on a cost-benefit analysis that is flawed at many levels. To begin with, ComReg has concluded that mobile network operators stand to gain major cost savings from rolling out a 3G network at 900 MHz, as compared to 1800 MHz and 2100 MHz. This assessment is based on a confidential, unpublished study commissioned by ComReg. There is no way to test the figures or the study's underlying assumptions since not even a summary of the study has been made available to the public. At a minimum, a redacted version of this study should be made available to interested parties for review and comment.

In devising its proposals, ComReg has underestimated the costs to existing licensees of clearing and releasing spectrum, relocating GSM customers, and participating in one or more auctions. ComReg also has failed to consider the cost to existing licensees, if unsuccessful at auction, of losing a major input into their respective mobile businesses. Finally, ComReg has completely underestimated the costs and disruptions to customers of the existing 900 MHz licensees under any of these scenarios.

On the benefits side, the consultation document alludes to increased competition as the main objective of the compulsory release and refarming proposals. However, ComReg has not even attempted to carry out a proper market analysis, including defining the scope of the relevant market and assessing the level of existing competition in a converging broadband market. Instead, ComReg has commissioned a simplistic and circular modelling exercise that purports to measure the welfare effects of changes in the number of mobile operators in Ireland. This modelling exercise would not come close to surviving an Article 7 review by the European Commission in connection with the imposition of far less intrusive forms of regulation, let alone the removal of spectrum usage rights. ComReg has similarly failed to provide any justification based on competition analysis for its proposal to impose MVNO obligations on all 900 MHz licensees.

All of the proposed options are completely disproportionate to any legitimate policy objective that might be achieved. The proposals are also discriminatory insofar as they would place the existing 900 MHz licensees at a distinct disadvantage vis-à-vis bidders with no GSM operations in Ireland in the type of "quick and simple" auction process apparently envisaged by ComReg. The proposals are thus incompatible with the EU and Irish regulatory frameworks for electronic communications networks and services.

These important spectrum management issues should not be considered in a vacuum. The adoption of a spectrum trading regime in Ireland could resolve many of the issues which ComReg wishes to address through its spectrum release and refarming proposals. Moreover, the potential freeing up of spectrum resulting from the Digital Dividend in 2012 (particularly in the upper part of the UHF band) could have a significant impact on the need for, and the relative value of, spectrum in the 900 MHz band for 3G services.

Proposed Way Forward

Spectrum Liberalisation

ComReg should take the steps necessary to open the 900 MHz and 1800 MHz bands for UMTS use as soon as possible after the European Commission's Liberalisation Decision enters into force. These steps should be taken independently of the process of determining how, when and to whom to allocate or re-assign spectrum in the 900 MHz band.

Assignment of the 900 MHz Spectrum

Meteor urges ComReg to re-evaluate its proposals for future licensing of the 900 MHz and 1800 MHz bands and to re-start its deliberations in a consultation open to a wider range of options that are more pragmatic, proportionate and conducive to investment and consumer welfare. To this end, ComReg should initiate a further consultation focusing solely on the future assignment of spectrum in the 900 MHz and 1800 MHz bands.

In developing a further set of proposals for consultation, ComReg should first give a full and fair hearing to the current licensees to ensure that it has (1) a thorough and accurate picture of the costs, benefits and technical/operational issues that are at stake, and (2) the benefit of the existing 2G and 3G licensees' individual and collective thinking on the optimal solutions for achieving ComReg's policy objectives in a transparent, objective, non-discriminatory and proportionate manner.

Ideally, the most efficient and least disruptive solution would be for ComReg to assign Meteor and the two other existing 900 MHz licensees 2x11.6 MHz of spectrum each within the 900 MHz band. As a possible way forward, however, Meteor offers a compromise approach for future licensing of spectrum in the 900 MHz band which strikes a reasonable balance amongst the various competing objectives while minimising the costs and inconvenience to consumers of the 3G transition. The proposal would allow for the entry of a fourth operator in the band while taking into account the existing 900 MHz licence holders' need for provisional arrangements in order to achieve a smooth transition.

At present there are three spectrum assignments of 2x7.2 MHz each in the 900 MHz band. There is also 2x13.4 MHz of unassigned spectrum in the band (including the existing GSM guard bands). Meteor's proposal is as follows:

- 2x10 MHz will be assigned to all existing 900 MHz licensees by expanding each operator's holding so that each has a contiguous 2x10 MHz block that includes as far as possible their current spectrum assignment. This could mean the following direct assignment of blocks: Meteor -930-940/885-895MHz, Vodafone 940-950/895-905 MHz; O2 950-960/905-915 MHz. The remaining 2x5 MHz of currently unassigned spectrum could be administratively assigned or auctioned to a new entrant to the band, at the earliest opportunity considered appropriate by ComReg.

- As demand for GSM services gradually declines, the requirement to maintain both spectrum for GSM services and 3G services diminishes. Once this point is reached over the next several years, operators could agree to a realignment of all spectrum allocations, each with a 5MHz assignment allocation. This would provide ComReg with an opportunity to re-assign the remaining spectrum vacated by the current licensees.

This proposal balances ComReg's preference for supporting entry in the 900 MHz band with the need to assure existing operators of the availability of 2x10 MHz of 900 MHz spectrum in order to lower the costs and potential customer disruption involved in the transition from 2G to 3G, and to support development of Long Term Evolution (LTE) services.

To ensure an efficient allocation of spectrum over time, whether assigned directly or at auction, the 900 MHz spectrum band should be priced based on the estimated marginal opportunity cost of the spectrum.

Assignment of the 1800 MHz Spectrum

ComReg has declined to make any concrete proposals as regards the future assignment of spectrum in the 1800 MHz band. This piecemeal approach requires further consideration as there is a need for a coherent, strategic and holistic plan for the management of mobile spectrum that is, or is likely to be, used in the provision of mobile broadband services. For many of the reasons stated above in respect of 900 MHz, Meteor believes that there is a strong case for the current 1800 MHz assignments to be renewed or reinstated prior to 2012.

B. ComReg should reconsider its proposals and consult further on future licensing of the 900 MHz and 1800 MHz bands

1. ComReg has failed to consider a viable and proportionate option: licence renewal or direct assignment

There are three mobile operators currently licensed to provide GSM services within the 900 MHz band. The 2G licences were awarded at different times, each for a term of 15 years. Meteor is licensed to operate at 892.7-899.9 MHz / 937.7-944.9 MHz (2x7.2 MHz) until 2015. There currently are two other operators which are licensed in the 900 MHz band (Vodafone and O2) until 2011. All three GSM operators are also licensed to provide 3G/UMTS services in the 2100 MHz band for a period of 20 years (until 2027 in the case of Meteor and 2022 for Vodafone and O2). There is a fourth operator providing 3G/UMTS services (3 Ireland) that is also licensed in the 2100 MHz band until 2022.

The consultation document focuses on the future licensing of spectrum in the 900 MHz band upon expiry of the existing licences. Three options are put forward, each of which is predicated on the compulsory release of the 2x7.2 MHz blocks in the 900 MHz band that are currently assigned to the three existing 2G licensees. All three options propose the repackaging of the vacated spectrum (along with currently unassigned spectrum) in the 900 MHz band and re-assignment by auction under various scenarios.

As discussed below and in response to the specific questions raised by the consultation document, ComReg's proposed approach is fundamentally flawed in several material respects. As a threshold matter, ComReg has failed to address a basic issue that should have been the starting point for any objective consideration of future licensing of spectrum in the 900 MHz band: the issue of renewal expectancy or direct assignment upon expiry of the initial licence terms. Instead, without any discussion, ComReg has leapt to the conclusion that the existing 900 MHz usage rights should be retracted upon expiry of the current licences to make way for one or more rounds of spectrum auctions. By failing to consider the alternative option of licence renewal or reinstatement through direct administrative assignment,[2] ComReg has failed to consider the least onerous option and appears to have pre-judged the outcome of this consultation, without due regard for the legitimate interests of the existing 900 MHz licensees.[3]

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[2] The administrative assignment of spectrum rights is recognised by a recently issued government report on Spectrum Policy as one of several permissible licensing procedures. *See* infra note 5.

[3] ComReg's authority to renew the licences of the three existing 900 MHz licence holders and to make a direct administrative assignment of the spectrum to them is fully consistent with the EU regulatory framework for electronic communications as well as Irish law and regulations, provided that the assignment process is objective, transparent, non-discriminatory and proportionate. Recent case law at EU level confirms these principles and clarifies that spectrum may be assigned in a way that limits the number of licensees in a national territory, so long as the limitation is justified on the basis of the general or public interest. Thus, a

2. Licensing policy and legitimate renewal expectations

Legal Framework

The Regulations which authorise the existing 2G licensees (and the licences themselves) provide for a licence duration of fifteen years. The licences are revocable annually unless renewed. No explicit conditions or criteria are set as the basis for annual renewal or revocation, or for renewal upon expiry of the initial fifteen-year term. However, as an administrative body, ComReg must exercise its spectrum management functions reasonably and in accordance with the applicable legislative and regulatory objectives. These include not only efficiency but also the principles of proportionality, non-discrimination, objectivity and the promotion of competition (amongst others).[4]

In the Government's recently issued Report on Spectrum Policy,[5] there is a clear recognition that the historic amalgamation of laws and regulations in the area of spectrum rights and management in Ireland is in need of rationalisation. Among the key principles addressed by the Report are the following:

> *"**4. Clarity on rights and access to spectrum**.*
> *In line with best practice, there should be clear rules on, inter alia:*
>
> *The rights and obligations of spectrum users, including:*
> *Licence duration and position regarding renewal of licence.*
> *. . .*
> *Rights to withdraw licences and recover spectrum, if necessary."*

Policy and Practice

The principle of licence renewal and expectation of renewal is of fundamental importance to the spectrum management process. Typically, where broadcasting or telecommunications authorisations are dependent on spectrum licences, there is an implicit or explicit provision for renewal unless certain circumstances occur (usually breach of material licence terms or non-use of the spectrum). Indeed, as was pointed out by Hutchison in its 31 January 2007 submission responding to the Hong Kong Government's Proposed Spectrum Policy Framework, the issue of licence renewal rights is globally recognised as being of fundamental importance to sound spectrum management policy:

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licensing regime which manifestly failed to meet these criteria and which had the effect of freezing an anticompetitive market structure in place whilst protecting the position of a dominant market player controlling nearly 90 percent of the Italian broadcasting market was deemed to be incompatible with the EU regulatory framework for electronic communications. *See* Centro Europa 7 Srl v. Ministero delle Comunicazioni e Autorità per le garanzie nelle comunicazioni, Case C-380/05, at paras. 97-103 (31.01.2008).

[4] ComReg Doc. No: 08/57, pp.7-9 and Annex C

[5] Department of Communications, Energy and Natural Resources, Report of Working Group on Spectrum Policy, Sept. 2008, Spectrum Policy Government Report ("Report"), Section 6.

> *"According to a policy paper in 2005 on mobile licence renewal issues published by the World Bank's Global Information and Communication Technologies Policy Division:*
>
> > *'As much as possible, policy makers and regulators should strive to promote investors' confidence and give incentives for long-term investment. They can do this by favouring the principle of '**renewal expectancy**', but also by promoting regulatory certainty and predictability through a fair, transparent and participatory renewal process'."*[6]

Although the existing 900 MHz licences are silent on the issue of renewal upon expiry of the initial term, the common practice in Europe and the policies issued and pronouncements made by regulatory authorities in Ireland and at EU level have created a well-founded and legitimate expectation of renewal on the part of licensees operating in the 900 MHz band. It is well settled under the jurisprudence of the courts of Ireland and the European Union that an individual has the right to rely on the principle of protection of legitimate expectations in situations where it is apparent that a government administration has led him to entertain justified expectations.[7] This important principle is of direct relevance to the future licencing of the 900 MHz spectrum. However, it is nowhere mentioned, let alone considered, in the consultation document.

Meteor's expectation that its 900 MHz licence would be renewed (or reinstated) at the end of the initial fifteen-year term is predicated on European licensing practice in this area to date but also, more specifically, on unambiguous statements made in 2001 by ComReg's predecessor when it articulated the policy that would apply when the existing 900 MHz and 1800MHz assignments expired:

> *"3G mobile telecommunications service licences will be issued for a period of 20 years. The WT licences will continue to be renewable on an annual basis for the time being, although the Director reserves the right to review this arrangement as part of her broader spectrum management duties. Continued availability of existing spectrum assignments in the 900 MHz and 1800MHz bands to mobile telecommunications licensees will be reviewed three years prior to licence expiry.* ***Retention of such spectrum***

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6 Hutchison Telecom Hong Kong Submission at p.7, *citing* World Bank (2005) "Mobile Licence Renewal: What are the Issues? What is at Stake?" (http://wwwwds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2005/09/23/000016406_20050923113019/Rendered/PDF/wps3729.pdf) (emphasis added)

7 Sofrimport Sarl v Commission of the European Communities (C-152/88) [1990] E.C.R. I-2477, [1990] 3 C.M.L.R. 80; Comptoir National Technique Agricole (CNTA) SA v Commission of the European Communities (C-74/74) [1975] E.C.R. 533; Glenkerrin Homes v Dun Laoghaire Rathdown County Council [2007] I.E.H.C. 298 – judgment not appealed; Lett & Company Limited v Wexford Borough Corporation, the Minister for Communications, etc. & Anor [2007] I.E.H.C. 195 – appeal to Supreme Court pending; Webb v Ireland [1988] IR 353.

> ***will be on a demonstrable need basis until the end date of the 3G licences.***" [8]

Consequently, so long as existing licensees have a demonstrable need for their 900 MHz and 1800 MHz allocations, the 900 MHz licences of the existing holders should be renewed at least until the expiry of their 3G licences, *i.e.*, in 2027 in Meteor's case.

Policies set at EU level are a separate and additional basis for Meteor's licence renewal expectancy. During 2004, the Communications Committee, established by the European regulatory framework, considered the issue of how to deal with the expiry of 2G rights of use.[9] The conclusions of the study were published in COCOM04-37, and within this document the Commission services set out principles and considerations to be taken into account by Member States. The work of the Communications Committee establishes a clear presumption that when approaching expiry, 2G rights of use should be renewed. The views of the Communications Committee are consistent with Irish policy as expressed in 2001, *i.e.*, so long as there is a demand for 2G rights of use, the licences should be renewed. This clearly will be the case for the next several years in Ireland.

The development of the Communications Committee's thinking is set out in COCOM04-21 and COCOM04-37. We note that the Irish representation is not explicitly noted as having contributed to the work items. We are not privy to why this is the case. If the output of the Communications Committee had been at odds with national Irish policy, it would have been expected that the Irish representation would highlight this at the time. No divergence of view was offered and the output of the work item is consistent with ODTR's 2001 national policy statement. It must therefore represent a statement of good regulatory practice supported by Ireland as an active member of the European Union and the Communications Committee.

ComReg's current proposals could, if implemented, have the effect of removing the existing 900 MHz usage rights from one or more of the existing licensees, despite the fact that there continues to be demonstrable demand for the spectrum for providing both 2G services and the next generation of 3G services. Liberalisation of the spectrum to include UMTS does not invalidate the existing licence holders' right to fair consideration of licence renewal. One of the key principles espoused by the Communications Committee is that "*it is important that sufficient flexibility be built into the renewal process to ensure that adjustments can be made to the terms on which 2G spectrum is used at the right moment in the future.*"[10] The Communications Committee implicitly recognised that existing rights of use should be subject to renewal and that these rights could be varied as European spectrum policy evolved.

ComReg's failure to consider the existing licence holders' legitimate expectations of renewal constitutes a fundamental flaw in its analysis and a serious potential violation of due process.

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8 ODTR 01/96 – Information Memorandum: Four Licences To Provide 3G Services In Ireland – ¶4.2 (emphasis added), December 2001.

9 The working item of the Communications Committee was named "Renewal of 2G Rights of Use".

10 COCOM04-46 at p.4 (23.06.2004)

Transitional Issues

It is important to bear in mind that the transition from GSM to UMTS represents an incremental upgrade in the services already being delivered over the 900 MHz band rather than a fundamentally different use of the licence.[11] Nonetheless, adjustments may be needed to the size and positioning of frequency assignments in the 900 MHz and 1800 MHz bands in order to promote continued efficient use of the national spectrum resource. In the near term, in order to transition towards 3G, existing operators will require some additional spectrum in the 900 MHz band in order to achieve an efficient transition that is not disruptive to existing 2G users (see response to Question 17, Section C, below). In the medium term, following 2G switch-off, it may be appropriate to consider whether the current assignment sizes of 2x7.2 MHz continue to be efficient, and could be reduced to 2x5 MHz.

As a starting principle, however, the existing licence holders' 900 MHz licences (as well as their 1800 MHz licences) should be subject to renewal upon the expiry of their initial 15-year terms, at least until the expiry of the accompanying 3G licences in the 2100 MHz band.

3. ComReg has failed to take into account the wider policy context

Broadband Policy and Industry Momentum

The Irish Government is currently consulting on policy in relation to broadband availability and next generation networks.[12] At the same time, the National Broadband Scheme[13] aims to ensure that broadband is provided to all areas by 2009/10. In addition, the Government recently launched a consultation seeking views on proposed principles for spectrum policy.[14] Both of these broadband initiatives highlight the importance that the Government attaches to investment and innovation in the communications sector to support improved coverage as well as higher-speed and higher-capacity wireless broadband services. Within this context, mobility will become an increasingly important feature.

In fact, Ireland is well ahead of the European curve insofar as the extent and pace of 3G broadband deployment and take-up are concerned. A recent study prepared by Analysys Mason indicates that together with Austria, Ireland has exhibited the fastest growth in 3G broadband in Europe over the past year.[15] By proposing a form of

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11 Under the EC's market recommendations and ComReg's own analysis, 2G and 3G voice and data services are classified as being in the same relevant market. This is in keeping with the principle of technological neutrality and reflects the fact that the services are direct substitutes, as evidenced by the expected migration of existing 2G customers to 3G over time.

12 Department of Communications, Energy and Natural Resources: Consultation Paper on Next Generation Broadband.

13 For further information see Department of Communications, Energy and Natural Resources, National Broadband Scheme.

14 Department of Communications, Energy and Natural Resources: Report of Working Group on Spectrum Policy, September 2008.

15 Head of Analysys Mason Ireland, Pat Kidney, interviewed by Gordon Smith in Irish Independent. 7th August 2008. "Faster services and lower prices herald mobile broadband arms race".

regulatory intervention in the sector that could dampen investment incentives and disrupt the momentum that the mobile industry has achieved in Ireland to date, ComReg has embarked on a very precarious course.

Digital Dividend Effect

ComReg has also failed to consider the opportunities that will arise from the future release of spectrum in the UHF band, the so called "Digital Dividend". This is a significant oversight given the suitability for high-speed mobile broadband services of spectrum in the 800 MHz band which could be released as part of the Digital Dividend. Many of the issues that ComReg has attempted to address with its proposed options could become irrelevant if this additional spectrum becomes available. As this spectrum is expected to become available by 2012, ComReg should have sought comment on its potential use and value for 3G broadband, at least as a data point to be taken into account in evaluating the options (including direct administrative assignment).

Secondary Trading Rights

The consultation document also fails to consider the impact of spectrum trading in any meaningful way. Whilst acknowledging that liberalisation of the 900 and 1800 MHz bands is "one of those areas which could benefit from trading in spectrum rights[16]", the document avoids consideration of the implications by observing that trading is not anticipated within the timeframe of "this project".

The possible adoption of a spectrum trading regime in Ireland, within a rolling licence regime, could resolve many of the issues which ComReg wishes to address through the consultation's compulsory spectrum release and refarming proposals, but in a much more orderly and efficient manner.

As Analysis *et al* (2004) have observed:[17]

> *"If trading and liberalisation are introduced, the main purpose of imposing expiry dates falls away. Except in cases of market failure, the secondary market should facilitate efficient reallocation and reassignment of usage rights, without the need for regulatory intervention. Indeed, the presence of an expiry date may distort the market, as it creates investment uncertainty that may unduly reduce the value of usage rights towards the end of their duration."*

The Government Report on Spectrum Policy identifies spectrum trading rights as a "core principle" to be enshrined in future legislation, and indicates that a policy paper

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16 Doc: 08/57, 6.4.1, Spectrum Trading, p.22.

17 Analysis, DotEcon and Hogan and Hartson. May 2004. "Study on conditions and options in introducing secondary trading of radio spectrum in the European Community." Report for the European Commission. p.83. http://www.dotecon.com/publications/secontrad_final.pdf

will be issued following consideration of comments received and the principles given effect in legislation that will be prepared and published subsequently.[18] Thus, the Government appears to be moving forward with steps to adopt legislation that would facilitate secondary trading – presumably well before the expiry of Meteor's current licence in 2015.

ComReg should reframe its proposals for future licensing of the 900 MHz and 1800 MHz bands in light of the policy context and carry out a holistic assessment of their impact on the Irish mobile broadband market.

4. Promotion of competition

In support of all three of its compulsory release and auction proposals, ComReg points to the potential for new entry into the market and the increased competition it presumes would result. For example, the consultation document expresses the view that Option A has the potential to "*promote competition by providing several opportunities for new entrants to acquire liberalised 900 MHz spectrum on the same terms as existing licensees*".[19]

The principal basis for ComReg's view that "more is better" in the case of mobile network operators is a Cournot model which purports to assess the welfare impacts of having one more and one less operator in the mobile market. A Cournot model, however, is simply a model of the cost-price point at which more operators produce a smaller margin. It completely ignores the *cost* implications of having more or fewer operators.

In the real world, increasing the number of independent operators would raise network and operating costs unless elements of the network were shared, and so the benefits of more competition would be correspondingly lower. As the number of independent mobile network operators is increased, the efficiency of spectrum use (for a given amount of spectrum) decreases due to infrastructure duplication, a reduction in statistical multiplexing and reduced coverage and service quality. These considerations have been the motivation for network sharing arrangements between mobile network operators in the UK, Germany and Australia, for example.

ComReg has not even attempted to weigh the potential cost and service disadvantages of introducing additional independent networks against any potential benefits that might result from more competitors operating in the market. By failing to do so, ComReg has ignored the difficult lessons of the dot.com bust – most importantly, that the development of *sustainable* competition is what matters, not the number of competitors.

Instead of relying on a theoretical model which assumes, rather than demonstrates, that more competitors in a market increase consumer welfare, ComReg should have undertaken a thorough competition analysis of the actual structure and dynamics of the market. A proper analysis should start with the definition of the relevant market,

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18 Report at p.36.

19 Consultation document at ¶8.4.2, p.37.

which would need to take into account the impact of convergence and the increasing substitutability of mobile and fixed broadband networks and services.

If, for the sake of argument, the market assessment were to focus on mobile wholesale and retail markets, the relative concentration in these markets would need to be considered. In a market composed of two large players with fairly stable market shares of more than 75% combined, and two much additional players with much smaller shares, it is by no means obvious that the entry of a potential fifth network operator would improve the competitive dynamics. Indeed, the opposite could be the result for the reasons discussed above. Yet, the consultation document makes no attempt to analyse the actual market dynamics, the likely impact of its proposals on the existing operators in the market, potential competition from fixed broadband networks (wired and wireless), or the sustainability of four or five mobile network operators over time in a country the size of Ireland.[20]

ComReg has also failed to consider the impact of its proposals on the continued ability of the existing 900 MHz licence holders to compete vigorously in the market. Because there is no guarantee that all (or, for that matter, any) of the existing licence holders will be successful at auction, the proposed options carry the very strong risk of distorting competition rather than promoting it over the near to medium term, if not permanently. The costs of spectrum vacation and relocation and the investment disincentives resulting from impending licence expiry dates could leave one or more weakened competitors in the market, assuming it (or they) did not exit the market completely. It is astounding that ComReg would risk throwing the entire mobile market into disarray at a time when it should be taking all reasonable measures to encourage further development of the mobile broadband industry by existing players in the market.

Competition is a means to an end: achieving for society the benefits of innovation, efficient and timely investment and appropriate levels of service and prices. ComReg's proposals to require full release and auctioning of the 900 MHz spectrum by existing operators has the very real potential to disrupt the achievement of the benefits that competition is supposed to deliver.

5. Implications for consumers

ComReg's proposed options are all intended to accelerate release of the currently utilised 900 MHz block in mid-to-late 2009. ComReg's stated objective is to promote new entry into the market and thereby bring to Irish consumers the benefits of increased competition.

As discussed above, an increase in the number of competitors does not necessarily mean stronger competition in the current circumstances. Moreover, ComReg has

[20] If the issue of the viability of a fourth mobile licensee gives serious pause to the government in a country the size of France, one might have expected a more thorough cost-benefit analysis by ComReg to justify its theory that a fifth operator in Ireland could enhance consumer welfare particularly given the current economic climate and recession concerns. *See* "Government Mulls Cancelling France's Fourth 3G Licence", World Market Research Centre (4 April 2008).

ignored the substantial disruption that consumers would experience if an existing licensee failed to acquire any 900 MHz spectrum, or if it acquired less spectrum than it currently occupies and would need in order to make a relatively smooth transition to 3G while continuing to serve its 2G customers. Indeed, ComReg blithely assumes that any such disruption would be limited on the theory that the existing 900 MHz licensees could use other spectrum bands to deliver existing services or could negotiate MVNO agreements, and that customers could in any event easily switch providers.

ComReg's view of the likely consumer impact is alarmingly simplistic and is based on what is at best a rudimentary analysis. To list just a few of the major oversights, the consultation document fails to take into account:

- **Higher retail prices** arising from a weakening of competition. If an existing operator is forced into distress as a result of unprecedented regulatory intervention, there will be a negative impact on service quality and innovation. This will be the case even if a new entrant (and by this we mean an operator not currently active in the mobile market) enters the market as it will take time for that new entrant to gain traction in the market.

- **Lack of service availability** during transfer to a new service provider. Whilst existing processes are designed to facilitate transfer within two hours, these processes were not designed for a mass migration, and even a two-hour absence of service would be costly and potentially politically unacceptable across a substantial share of the market.

- **Coverage differences** between networks would mean that some consumers who previously had good service might find that they no longer had satisfactory service after switching providers, even though there may be no change or even an improvement in overall coverage with the reallocation of 900 MHz spectrum and the allocation of currently unassigned spectrum.

- **Existing handset incompatibility** insofar as a large base of existing handsets would not necessarily support alternative frequencies that operators might use to maintain adequate service at a reasonable cost if they are unsuccessful in bidding for the 900 MHz spectrum (for example UHF spectrum).

- **The additional costs** arising from spectrum charges will be passed on to consumers. Certain types of consumers may be impacted more detrimentally than others. It is well documented that pre-pay mobile services contribute significantly to the public interest objectives of promoting cost-effective and ubiquitous access to voice telephony services. If retail costs increase, lower-income users of mobile pre-pay services may be forced to exit the communications market.

- Possible **degradation of the quality of service** if existing licence holders are not successful in gaining access to adequate spectrum.

- **Environmental concerns** that could arise if existing licence holders are not successful in acquiring spectrum and additional operators enter the marketplace.

6. Impact on investment

ComReg's proposals to impose full compulsory release and to auction off existing licence holders' spectrum usage rights would, if adopted, establish an unwelcome and ill-conceived precedent for the future of spectrum management in Ireland. There is no objective reason why other holders of spectrum licences should be treated any differently upon the expiry of their spectrum licences going forward, and this would introduce major uncertainty into the system.

Meteor is currently licensed to provide GSM services within the 900 MHz band until 2015. An auction could, as early as 2009, produce a result that would seriously undermine Meteor's investment incentive opportunity for the remaining period.

The investments that are required to operate state-of-the-art mobile networks are substantial and continuous, with long payback periods. If there is no right of licence renewal at the end of the licence term, there will be a strong disincentive on the part of new licence holders to making further investments after the initial outlay. Similarly, if a licence holder is unsuccessful in the auction process, it will have no incentive during the period running up to the termination of its licence to do anything but sweat the assets, since in effect it will no longer be a going concern.[21]

A degree of business failure is inevitable in any commercial market. However, for business failure to be solely attributable to the actions of a national regulator is beyond the bounds of reasonableness. Such an outcome would be contrary to the very principles that ComReg is charged with upholding, namely:

- The promotion of **sustainable** competition,
- The promotion of **efficient** investment, and
- Ensuring that users derive **maximum benefit** in terms of choice, price, and quality.

In proposing compulsory spectrum release and auction, rather than an equitable licence renewal process, ComReg has failed to take account of the impact this could have on the continued development of, and investment in, the sector as a whole. Uncertain market outcomes do not lend themselves to positive business environments. Creating uncertainty within the market and injecting the possibility that operators currently providing services could lose access to spectrum would seriously distort

[21] The importance of "presumption of renewal" or "renewal expectancy" was considered in a paper by Guermazi and Neto in 2005, who argued that a licence expiry date can distort the market by creating investment uncertainty that unduly reduces the value of usage rights towards the end of their duration.

investment incentives and could jeopardise the gains that the industry is making in rolling out 3G.

7. Technical efficiency

The main policy objective underlying ComReg's proposals appears to be that of efficiency. However, ComReg's auction proposals fall considerably short of promoting the concept of technical efficiency. There exists a very real possibility that if this method is used, the spectrum assigned will not be contiguous. Yet, as ComReg itself has acknowledged, "*operators having access to contiguous blocks of spectrum would represent an efficient use of spectrum as this would minimise the overall need for guard-bands. In addition, it is important to ensure that spectrum blocks do not become stranded and thus unused"*[22].

Contiguous spectrum will be particularly important in the longer term to leverage the benefits of 3G LTE technology. In the medium term, operators' use of contiguous spectrum will also be the most efficient way of controlling inter-system (GSM / WCDMA) interference. The auction proposals advocated by ComReg therefore have the potential to generate a highly inefficient outcome.

ComReg's failure to address these concerns also creates the risk that mobile operators in Ireland will be denied the more efficient option of wider bandwidth channels, the benefits of which are outlined in our answer to Question 11 in Section C of this response.

8. International precedents do not support ComReg's proposed options

The consultation document contains examples of international "best-practices" in apparent support of ComReg's three proposed options. Upon closer inspection, however, the examples provided do not establish a precedent for full compulsory release of the existing 900 MHz licence holders' assignments. Indeed, the examples by and large all involve the existing licensees retaining all or a substantial portion of the 900 MHz bandwidth originally licensed to them. Several of these references are discussed below.

Singapore

The guiding principle of spectrum liberalisation in Singapore was to:

> *"ensure the most economically efficient use of scarce spectrum to promote innovation in and growth of a vibrant information economy* ***while recognising the need to ensure continuity of services***[23]***"***

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22 Doc. No: 08/57, 8.2.1.1. Technical Efficiency

23 IDA Singapore, Proposed Framework for the Reallocation of Spectrum in the 900 MHz and 1800 MHz Frequency Bands, 28 June 2007, Part 1, Section 4 (emphasis added).

The goal of the Singapore regulator (IDA) to ensure continuity is one that ComReg has neither mentioned nor explored in connection with the options proposed in this consultation. In response to vigorous opposition to its preliminary "greenfield reassignment" proposal, the IDA accepted that the result of such a process could be increased costs to consumers. The IDA therefore amended its proposal to grant the existing licence holders a right of first refusal after the initial bidding stage, in which all lots were treated identically.

In the event, the existing licence holders were the only bidders to participate in the process and they retained their original spectrum assignments. The Singapore example thus offers nothing in the way of experience with respect to the costs and disruption that could result for both operators and consumers in the event of compulsory release and reassignment.

UK

In September 2007, Ofcom published a consultation document on the application of spectrum liberalisation and trading to the mobile sector.[24] Ofcom effectively rejected full mandatory release of the 900 MHz spectrum and instead favoured (preliminarily at least) a partial release option.

Ofcom disfavoured the full mandatory release option on the basis that it would impose huge costs on the existing licence holders and reduce the potential cost savings from liberalisation of the spectrum.[25] Ofcom therefore determined that the mandatory release of all 900 MHz assignments would be disproportionate.[26] It is noteworthy that Ofcom's proposal to require a partial mandatory release of the 900 MHz spectrum would leave each of the existing 900 MHz licensees with 2x12.2 MHz, substantially more than the transitional assignment of 2x10 MHz that Meteor has proposed as a compromise solution for consideration (see response to Question 17 in Section C, below).[27]

Hong Kong

In Hong Kong, the Office of the Telecommunications Authority consulted interested parties on the "Assignment of the Available Radio Spectrum in the 900 and 1800 MHz Bands"[28]. In assessing the market and in an effort to satisfy increasing demand for both existing and innovative services, the regulator made a proposal that the available spectrum in the 900 MHz band should be assigned to the existing 2G mobile carrier licensees[29].

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24 OFCOM. September 2007. "Application of spectrum liberalisation and trading to the mobile sector". http://www.ofcom.org.uk/consult/condocs/liberalisation/liberalisation.pdf

25 Ofcom at 13.8

26 Ofcom at 13.12

27 Consultation is still pending. Even Ofcom's partial release proposal was vigorously opposed by the existing 900 MHz licensees in the UK. The consultation process is still open.

28 Telecommunications Authority of Hong Kong: Assignment of the Available Radio Spectrum in the 900 MHz and 1800 MHz Bands, 18.01.2008.

29 The existing GSM mobile carrier licensees are China Mobile Peoples Telephone Co. Ltd., the consortium of Hong Kong CSL Ltd. and New World PCS Ltd., Hutchison Telephone Co. Ltd., PCCW Mobile HK Limited and SmarTone Mobile Communications Ltd.

France

In 2007, the French Regulator, ARCEP, also made a decision to liberalise use of the 900 and 1800 MHz bands[30] with respect to the introduction of 3G in the 900 and 1800 MHz frequency bands in metropolitan France.

ARCEP concluded that:

- as early as 2008, any 2G-3G operators wishing to do so would be allowed to use the 900 MHz spectrum for 3G; and
- any new 3G entrant authorised following the application procedure for the fourth 2100 MHz UMTS licence would also have access to the 900 MHz spectrum once it was returned by the existing 2G operators. The spectrum would be made available in late 2009 outside densely populated areas and in late 2012 in the rest of the country.

The French regulator made provision for two scenarios:

1. the use of the 900 and 1800 MHz bands in a configuration with three 3G operators, and
2. the use of the 900 MHz band in a four 3G-operator configuration.

At the present time, it is unclear whether the tender for a fourth mobile entrant in France will go forward, or on what basis. A Parliamentary debate on the issue is expected to take place in the coming months.

9. The need for a complete reassessment is manifest

For all of the reasons discussed in this section and in Meteor's specific responses to the consultation questions in the following section, ComReg should undertake a complete reassessment of its position. The proposed options outlined in the consultation document are incompatible with sound public policy as well as established legal principles and ComReg's statutory objectives. As indicated by the order of priority in which ComReg has assessed the various options, "technical efficiency" would appear to have precedence over all other factors under evaluation.

Although efficiency of process and of outcome is unquestionably a desirable goal, market mechanisms are not the optimal solution in every circumstance. There is a general public interest in the continued viability of Ireland's mobile industry and the operators of which it is comprised, as well as in the continuous, non-disrupted provision of 2G and 3G services to Irish consumers at reasonable prices. This important public interest is given short shrift in the consultation document's assessment of the proposed options and in its failure to consider more proportionate options that do not inherently discriminate against existing licence holders.

[30] Directions set by ARCEP on the introduction of 3G in the 900 and 1800 MHz mobile frequency bands in Metropolitan France, 07.05.2007.

In light of the challenging market conditions in which the mobile industry is operating, ComReg's proposals run a high risk of regulatory failure. For all of these reasons, Meteor strongly urges ComReg to reconsider the available options and restart the consultation process on the basis of a more thorough and balanced cost-benefit analysis and a careful assessment of the existing licence holders' legitimate expectations.

C. Responses to specific questions raised by ComReg

1. **Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions? Please provide supporting arguments with your answer.**

Meteor supports prompt liberalisation of the 900 MHz and 1800 MHz bands to allow for the deployment of UMTS. Significant work has been completed by the EC's Radio Spectrum Committee and CEPT to define a set of technical conditions that will ensure the compatibility of GSM and UMTS networks operating at these frequencies. The Draft Liberalisation Decision, once in force, will establish a harmonised European framework for coordination to safeguard the continued use of these frequency bands for GSM and will introduce the flexibility required to allow 3G/UMTS to be deployed. This is a positive step because it will allow for more efficient and effective spectrum use across the range of bands authorised for GSM or UMTS based on commercial and technical considerations rather than regulatory fiat.

Given the favourable propagation characteristics of the 900 MHz band, liberalisation will enable licence holders to cover larger distances than is currently possible in the higher frequency bands that are authorised for UMTS. This should be of particular benefit in providing broadband services to customers in rural and less densely populated areas.

Much work remains to be done, however, before any definitive conclusions can be drawn about the size of the cost savings that may be gained by deploying UMTS at 900 MHz versus higher frequency bands under various scenarios. In this regard, we question the estimated cost savings cited by ComReg in section 5.3 of the consultation document, which has been taken from a confidential report that it commissioned earlier this year. While it may be true that 900 MHz offers propagation benefits relative to higher frequencies, there is no way of knowing whether the study cited by ComReg has adequately considered all of the relevant cost factors under various operational scenarios. It is also unclear whether ComReg has taken into account the very real costs that will be faced by existing operators as they transition their networks from 2G to 3G technology. A redacted version of this study should be provided to interested parties for review and comment to ensure that the conclusions drawn can be properly tested.

Whilst Meteor is supportive of ComReg's liberalisation proposal, Meteor vigorously disagrees with the way in which the consultation document attempts to link implementation of the Draft Liberalisation Decision to retraction of the existing 900 MHz licences and auctioning off of the spectrum. The draft decision makes no such linkage and indeed exhorts national regulators to carry out the liberalisation process in a way that protects the continued operation of GSM networks during the transition to UMTS, for as long as there is reasonable demand for GSM services.

If any of ComReg's proposed compulsory release and auction proposals are adopted, long-term development of the mobile sector in Ireland would be seriously undermined

as a result of the chilling effect the process would have on current and future incentives to invest. The outcome could also be highly disruptive to GSM customers and existing 3G broadband customers, as explained below.

Meteor therefore urges ComReg to decouple the liberalisation process and timetable from issues related to the expiry of the current 900 MHz and 1800 MHz licences. To achieve the objectives and benefits of liberalisation as promptly as possible for the Irish market, ComReg should take the steps necessary to open the 900 MHz and 1800 MHz bands for UMTS use as soon as practicable after the Draft Liberalisation Decision enters into force.

2. **Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHZ bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.**

Meteor agrees that the licenses for these spectrum bands should be service neutral, subject to the caveat that service neutrality must nonetheless ensure spectrum efficiency, minimum interference, protection of existing GSM (and UMTS) services, pan-European operation and the best interests of consumers.

The currently available WCDMA Technology allows the simultaneous delivery of multiple services in parallel across the network to subscribers. These services are delivered with full mobility.

Based on technical investigations, in particular the Electronic Communications Committee's (ECC) Reports 82 and 96, and in response to the Mandate of 5 July 2006, CEPT[31] has produced a report which concludes that UMTS/900/1800 networks can be deployed in urban, sub-urban and rural areas in co-existence with GSM900/1800 networks by using appropriate values for carrier separation. For this reason, the explanatory memorandum to the Draft Liberalisation Decision explains that, "*[a]s a first step,*" liberalised use of the spectrum will be allowed for UMTS.[32] Thus, UMTS has been added to the annex of the Draft Liberalisation Decision.

Service and technology neutrality should not be introduced without adequate attention to the resolution of technical compatibility issues in order to ensure that any new technologies and uses will not interfere with existing ones. It is therefore Meteor's recommendation that only those services based on technologies that are identified in the annex of the final Liberalisation Decision (as it may be amended from time to time) should be allowed in the 900 and 1800 MHz bands.

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31 Radio Spectrum Committee Working Document: CEPT Study for UMTS operating within the GSM 900 and GSM 1800 frequency Bands (20.04.2007).

32 Explanatory Memorandum at p. 2 (emphasis added)

3. **Do you agree that a review of the annual licence fees is appropriate at this time to determine whether or not these fees should be adjusted to take into account the increased value associated with liberalised 900 MHz [and 1800 MHz] licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.**

In connection with the proposed liberalisation of the 900 and 1800 MHz bands, ComReg proposes immediately to review and revise (presumably upward) the annual licence fees that currently apply.

There is no reasonable basis for an increase in the annual spectrum fees at this time, solely on the basis of a regulatory decision to liberalise the spectrum. The proposed licence change is intended to permit an incremental upgrade to existing services offered using the same spectrum, and there is thus no justification at the present time for any upward adjustment in the applicable fees.

Even if a new valuation could be justified, it would be contrary to public policy and sound spectrum management to impose a fee increase in the near term. It will be physically impossible for the existing GSM licence holders to operate 3G and 2G at 900 MHz in parallel with an assignment of only 2x7.2 MHz. A 3G carrier requires a minimum of 2x5MHz of spectrum. This would leave 2x2.2MHz for GSM use. Bandwidth of 2x2.2MHz is simply not enough to provide sufficient GSM capacity to offer a mobile service. This is true even in the remoter areas of Ireland where traffic demands on the network may be expected to be lower.

As discussed in greater detail in response to Question 17, liberalisation can best be achieved through a phased and measured approach that allows the existing licensees to transition their networks from 2G to 3G in an orderly fashion over a period of several years.

Indeed, given the significant market uncertainty created by ComReg's proposals to retract and auction off the existing 900 MHz licences, the actual value of the annual licence fees could be closer to zero at present and could be expected to remain at a depressed level until the regulatory framework is stabilised and the full implications of the final package of measures are clear following final implementation.

The only fair and proportionate way of dealing with this question is to assess the value of the licences after liberalisation takes full effect and the disposition of the existing 900 MHz licences is established. This means that no change in the annual fee should be considered until (1) it is clear that sufficient spectrum will be available to enable existing GSM operators to deploy UMTS, *and* (2) the identities of the licence holders that will have access to this spectrum are established.

Ultimately, ComReg should consider whether an increase in the annual licence fee would be in the public interest. Meteor recognises that there might be a temptation to use the occasion of spectrum liberalisation as a pretext for generating funds for the national treasury. That, however, would have negative consequences for operators as well as consumers. The additional costs arising from increased spectrum fees will be passed on to consumers, and certain types of consumers may be negatively impacted

more than others. For example, it is well documented that pre-pay mobile services contribute significantly to public interest objectives of promoting cost-effective and ubiquitous access to voice telephony services. If retail costs increase, lower-income users of mobile pre-pay services may be forced to abandon the service.

Spectrum liberalisation relaxes a constraint on the use of 900 MHz spectrum and thereby offers scope for greater broadband coverage, particularly in the less densely populated areas of Ireland. However, the costs to existing operators of making the transition from 2G to 3G are not trivial. Moreover, if the licence fees are increased significantly, consumers will be deprived of the benefit of any longer-term efficiency gains from use of the 900 MHz spectrum. In effect, a fee increase would raise operators' costs and transfer the benefits of liberalisation to the Government instead of the consumer. This would not be consistent with ComReg's statutory responsibilities and objectives or the Government's broadband policy.

Meteor therefore urges ComReg to re-evaluate the licence fee issue (if at all) at an appropriate time in the future, taking into account the policy issues and the commercial realities associated with the post-liberalisation transition process.[33]

Although ComReg has neglected to ask for views on fees for the 1800 MHz licences, the consultation document indicates that it contemplates similar treatment as for 900 MHz. Meteor is of the view that it would likewise be premature to adjust the annual licence fee for the 1800 MHz licences at this time.

4. **Do you agree with ComReg's proposal that an auction mechanism is the most appropriate format for granting future 900 MHz spectrum licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.**

In the near term, Meteor agrees that the use of an auction mechanism may be an appropriate way of assigning rights to the 900 MHz band that is currently unutilized (Block A). As Meteor explains elsewhere in its response, after the existing 900 MHz licence holders have completed the transition from 2G to 3G over the next several years,[34] it may also be appropriate to assign the portions of the spectrum that will then become available by means of an auction. In cases such as these, there is merit in ComReg's assessment that auctions can be a "quick, fair and transparent" method for assigning spectrum. Of course, any decisions on the conditions under which spectrum would be assigned in future years should be taken in the context of the circumstances that exist at the time, which may include the availability of additional spectrum freed up in the Digital Dividend process and the advent of spectrum trading rights.

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33 In its response to Question 17 below, Meteor discusses the issue of valuation and associated fees in connection with the potential assignment of the currently vacant 2x5 MHz block in the 900 MHz band.

34 It is not possible to accurately predict the timescales within which the transition will be complete. This will depend on a number of factors including the penetration of compatible 3G terminals and the roll-out of 3G coverage with geographic and demographic reach equivalent to existing 2G network coverage. The timing of 3G network roll-out also is directly dependent on the bandwidth that will be available in the 900 MHz band, which will be determined by this consultation.

As demonstrated above, however, there is no basis for reassigning the 900 MHz blocks that are currently in use to anyone other than the current licence holders. Any forced release of the currently assigned 900 MHz spectrum would be incompatible with the Draft Liberalization Decision and key tenets of the EU and Irish regulatory frameworks for electronic communications services. There is thus no reason to consider at this time the question whether an auction process is an appropriate mechanism for re-assigning this spectrum.

It is nonetheless important to point out that all of the options set forth in the consultation document (A-C) are predicated on the incorrect assumption that the existing 900 MHz licence holders may be required to relinquish the 900 MHz blocks currently assigned to them without regard to their investments and ongoing businesses relying on the use of these bands or the impact on their customers. The proposals to require compulsory release and auction of the existing assignments also completely ignore the track records that the existing licensees have established in complying with their core licence conditions and terms. As demonstrated in Section B above, and in response to Question 7 below, ComReg's proposals are fundamentally flawed in these critical respects.

Even if there were legitimate reasons for ComReg to retract the usage rights of the existing 900 MHz licensees, the high-level auction proposals outlined by the consultation document would be anything but "quick and fair". The consultation document is notably silent on the issue of auction design under any of its proposals. In footnote (45), ComReg indicates that "[f]ull consideration will be given to auction design following the outcome of this proceeding".

Meteor respectfully submits that it would be a violation of due process for ComReg to move forward with any auction process unless the essential details had been fully and thoroughly consulted with key stakeholders. In any event, it will be extremely difficult – if not impossible – to design an auction process in a way that ensures a non-discriminatory, objective and proportionate result under the complex combination of circumstances that would be at play here, including for example:

- the fact that three of the bidders will have invested substantial sums based on past and existing use of the spectrum in question and will place a different value on the spectrum than bidders who have not made such investments,

- the variation in the expiry dates of the existing licences,

- the fact that Blocks A and B are in the E-GSM frequencies and as such do not lend themselves to 2G because of the incompatibility of a large number of handsets currently in circulation,

- the fact that the valuation of each lot will therefore be different,

- the fact that the number of blocks available to any one bidder (up to two if a 2x10 MHz cap is adopted) will be uncertain until the end of the auction,

- that there is greater value in securing contiguous blocks and an uneven number of blocks available,

- the interplay of other technology and service types, such as the anticipated introduction of LTE,

- anticipated impact of future spectrum availability for mobile use in the 800 MHz, 1800 MHz and 2600 MHz ranges,

- the potential for secondary trading rights to be introduced,

- the apparent but unexplained and uncertain shift in ComReg's policy with respect to licence renewals going forward, and

- the potential to game the system to bid up the price of the spectrum held by the existing licence holders.

Although it may be possible for ComReg to develop some variation of a combinatorial auction design that could reduce the potential for an unfair and inefficient outcome, the end result would be far from simple from the perspective of both ComReg and bidders. With complexity comes the potential for gaming of the system and distorted outcomes. Meteor is therefore firmly of the view that under the exceedingly complex set of variables and motivations that would be at play, the prospect of incorrect valuations and seriously disruptive results remains high under all three of ComReg's proposed options.

5. Do you agree with ComReg's proposal to place a cap of 2x10 MHz on the amount of spectrum that any one licensee can hold in this band? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

It is commonly accepted that mobile operators require a minimum of 5MHz to operate a 3G service. Therefore, for liberalisation of use to move from a theoretical concept to actual reality, operators currently licensed within this band will require an absolute minimum of 10 MHz to maintain service integrity whilst attempting a gradual transition from GSM to 3G.

ComReg proposes to cap the maximum allocation at the minimum necessary. This will have the effect of increasing the transition costs of operators migrating from 2G to 3G. The cost burden would be minimised if each migrating operator had access to an assignment of 12.2 MHz (*i.e.* 2x5MHz for 3G and 2x7.2MHz to maintain 2G services as currently deployed). However, there is insufficient 900 MHz spectrum for three operators to each acquire 2x12.2MHz in the 900 MHz band[35]. Consequently we

[35] Within the next several years, it is anticipated that some of the UHF band in the 800 MHz range will be freed up for mobile broadband use. This spectrum also has very favourable propagation characteristics to mobile broadband services. If this spectrum becomes available, the issue of the cap in the 900 MHz band may need to be revisited.

recognise that there will have to be an element of compromise between network cost increases to existing operators and the maximum spectrum cap. Setting the maximum cap at 2x11.6MHz for the existing three licensees would be ideal insofar as it would help to reduce the cost burden for each operator as it continues to offer GSM service (in compliance with licence obligations and continuing demand) whilst also allowing more efficient use of the band to deliver 3G services. However, although this would be optimal in a three-operator scenario, we recognise that it would undermine the ability of a fourth operator to utilise the 900 MHz band.

Taking these factors into account, and in a spirit of compromise, Meteor recommends the approach proposed in response to Question 17 if ComReg decides that a fourth operator should be licensed. Under Meteor's compromise proposal, the three existing GSM operators would be granted temporary access to 2x10 MHz each in order to facilitate the transition from 2G to 3G. This smaller block (relative to 2x12.2 MHz) will have a negative impact on the transition costs of the existing 900 MHz licensees, and ComReg would therefore need to address this trade-off in its cost-benefit analysis when assessing the proposed policy position to encourage the entry of a fourth licensee in the band.

6. **Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.**

Meteor agrees that future licensing for spectrum should be service neutral. Our detailed comments on service neutrality are set out in response to Question 2.

7. **In the absence of spectrum trading, what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.**

The consultation document proposes that a licence should be of sufficient duration to allow operators to recoup the costs of investment in nationwide infrastructure. On this basis, ComReg has proposed a minimum licence duration of 10 to 15 years. ComReg also proposes to vary the duration of the 900 MHz spectrum licences depending upon the date of expiry of the existing licences so that all future licenses in the band have a common termination date. Under the three options outlined in the consultation document, the new licence terms would vary in length from 9 or 10 years[36] to a maximum of 15 years.

Meteor agrees that, in determining the appropriate duration of a licence, the *minimum* term should be linked to the amount of time required for recouping the initial

[36] Meteor notes that ComReg's consultation document makes reference to a licence duration of between 10 and a maximum of 15 years, with all licences due to expire on the same date. In practice, if an operator were to gain future access rights to the 900 MHz spectrum currently licensed to Meteor, the first possible date for access would be June 2015. Current proposals aim to release the first blocks of vacant spectrum in 2009. Based on ComReg's 15-year maximum licence proposal, access to this last block of spectrum would terminate in 2024, thereby producing a licence with a duration of 9 years.

investment in the "network" if by that ComReg means the mobile network *business*. This would include not only investment in the network gear but also operational support, billing, customer care and associated systems, including the periodic upgrades that are required to sustain and enhance service and deliver new applications and solutions to customers across the country.

Innovation and investment are ongoing processes for any network operator and the dynamic nature of the telecommunications industry means that a term of 9 or 10 years would not come close to allowing a licence holder to recover its investment. The extant UMTS licences have a longstop termination date of 20 years, and ComReg has offered no reasons why the term of the new (or reinstated) 900 MHz licences should not be of the same minimum duration.

The more fundamental issue, however, is the basis on which these licences should be renewed or reinstated. The failure of the consultation document to come to grips with this critical concern is the central flaw in ComReg's proposals.

Under the regulation governing the extant 900 MHz licences, the convention is that the licences are revocable on an annual basis absent renewal, with a longstop duration of 15 years[37]. Contrary to generally accepted principles of spectrum licence management, the regulation and the licences are silent on the criteria for renewal or reinstatement. It has been the common industry understanding, however – and common practice in the rest of the European Union – that these licences would be renewed or reinstated at the end of each year *and at the end of the longstop termination date* unless (1) the licence holder were found to have intentionally breached material provisions of the licence, or (2) the spectrum was no longer needed for the purpose for which it was initially granted.

These issues are explored in greater depth above in Section B.2 of this response. Meteor urges ComReg to give due consideration to the impact that failure to renew or reinstate the extant 900 MHz licences could have on existing operators and their customers. In doing so, ComReg should give full consideration to other, more reasonable licence management approaches that reflect the nature of the business and the realities of the marketplace.

8. Do you agree with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band? Please provide supporting arguments with your answer.

ComReg proposes to set different licence termination dates for the new or reinstated licences with the objective of aligning the expiry dates. ComReg believes this will facilitate more efficient licensing of the 900 MHz band in the future.

ComReg's focus on administrative efficiency in this context has apparently blinded it to the market inefficiencies that would result, particularly if ComReg succeeds in establishing a draconian regime pursuant to which a well-run business stands the risk of being dismantled at the end of the technical expiry date of the licence. This

[37] S.I. No. 339 of 2003.

approach is misguided insofar as it loads the efficiency gain on the regulator and not the operators, and adversely impacts market development, investment and innovation.

If, in line with our response to Question 7 above, the generally accepted criteria for renewal of the licences are ultimately codified, the nominal (longstop) duration of the licences should be less of an issue. In any event, ComReg will have an opportunity to revisit this issue when it considers revising the licences to include secondary trading rights. Until that time, ComReg should stipulate that the minimum term of each licence will be no less than 20 years, subject to reasonable, objective, proportionate and transparent criteria for annual renewal and at the end of the stipulated term.

9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences?

There is no justification for ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences.

The sole basis offered by ComReg for this proposed obligation is that a similar requirement has been included "*in the past in licences awarded with larger spectrum allocations*"[38]. Meteor is aware of only one spectrum licence that has been awarded containing a MVNO obligation. This licence, the "A" licence to provide 3G services issued to Hutchison 3G, was awarded in 2002 – prior to the entry into force of the current European regulatory framework for communications in 2003.

Since transposition of the EU framework in Ireland, the imposition of a MVNO access obligation can be justified only if an operator is determined to have Significant Market Power ("**SMP**"). This is unambiguously confirmed by the European Commission's comments on a proposal by the Polish regulator to impose a MVNO obligation:

> **Lack of legal basis for the imposition of mobile access obligation on PTC**
>
> Article 8(3) of the Access Directive, in line with the spirit of the Framework, states that the general rule for imposing any obligation is to conduct a market analysis and SMP assessment. This is also underpinned by Recital 27 of the Framework Directive which clearly states that "*it is essential that ex ante regulatory obligations should only be imposed where there is not effective competition, i.e. in markets where there are one or more undertakings with significant market power, and where national and Community competition law remedies are not sufficient to address the problem.*" Therefore the appropriate way to impose an access obligation as defined by UKE in the notified draft measure is to examine the market for mobile access and call origination and – if results of market analysis show that it is not competitive – impose appropriate remedies, including an access obligation. The Commission notes that UKE so far has not finalised its market analysis regarding the market for access and call origination on public mobile telephone network[10].

ComReg has not undertaken a market review to assess whether there is a lack of effective competition requiring a remedy. Given the outcome of ComReg's previous attempt to impose MVNO obligations on the two largest mobile operators in Ireland, any proposed obligations of this nature will need to be justified on the basis of a

[38] Case PL/2007/0631.

thorough and comprehensive competition assessment. In particular, ComReg must follow procedures in accordance with Regulation 27 of the Framework Regulations and objectively demonstrate the following:

- The mobile market for access and call origination services is not effectively competitive following a forward-looking assessment of that market;
- the licensees to which the obligation applies possess SMP on the relevant market; and
- A MVNO access obligation is objectively justified and proportionate to address the competition problem identified.

Even if ComReg concludes that there is a basis for imposing a MVNO obligation on the two largest 900 MHz licensees, there certainly is no justification for imposing such a requirement on Meteor.

10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

Meteor agrees that licensing for spectrum in the 900 MHz band should be technology-neutral. Our detailed comments on service and technology neutrality are set out in response to Question 2.

11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2x5MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

In the context of legislating for spectrum liberalisation, and in the short to medium term, Meteor would look to ComReg to renew operators' licences respecting the spectrum bands currently assigned.

However, to ensure that Meteor can shift 3G traffic to 900 MHz spectrum and continue to comply with its obligations in respect to GSM services, an additional assignment of spectrum from the 900 MHz band will be required in the short to medium term.

In a spirit of compromise, Meteor could accept that this should be viewed as a "transitional" arrangement. As 2G traffic gradually decreases, this would allow each operator gradually to shift traffic down and to operate within an assignment of 5MHz. It is only at this point, where all operators can manage traffic within the same spectrum assignment, that a green-field approach to the assignment of unused spectrum could reasonably be addressed.

However, in the interest of the consumers and spectrum efficiency, the minimum block size should optimally be 10 MHz of contiguous spectrum, for the following reasons:

- 10 MHz is likely to allow introduction of UMTS alongside GSM, balancing impact to consumers, transition cost increases to existing licensees, a slower transition process and ComReg's desire to encourage a fourth operator into the band; and

- 10 MHz is likely to allow sufficient spectrum to support declining numbers of GSM subscribers, while transitioning from GSM to a full UMTS (5 MHz per channel) initially and finally to a full LTE network (10 MHz per channel).

Contiguous spectrum is a key requirement to take advantage of LTE, to maximise spectrum efficiency and to maximise the benefit to the consumer. A 10 MHz LTE channel employing 2 x2 MIMO and 64 QAM modulation could allow peak speeds up to 84 Mbit/s.

However, any option proposed by ComReg must ensure that spectrum assignments are not fragmented to ensure spectrum efficiency and maximum consumer benefit.

As Meteor has noted previously, there will be a trade-off between ComReg's proposed policy to encourage a fourth licence in the 900 MHz band, and the impact of cost and time-to-transition on the existing operators and their customers. Without prejudice to the outcome of the opportunity cost analysis that ComReg must undertake in this regard, should ComReg decide to auction or directly assign the vacant 2x5 MHz block and there proves to be no demand on the part of a new entrant to the band, Meteor recommends that this spectrum be temporarily awarded to the existing licensees to further facilitate the transition.

12. Do you agree with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

The regulator's proposal is to have no guard bands, with operators policing their own interference levels. Meteor generally supports this proposal in the context of a division of bands into seven 2x5 MHz blocks, as this ensures efficiency of use.

It should be noted that advanced filters on 3G allow operators to make the most efficient use of the available spectrum and negates the requirement of fixed guard bands. Placing the 3G channel "centrally", *i.e.* sandwiched by GSM channels on either side, will allow each individual operator to administer its own inter-system interference. Placing the 3G channel "centrally" also allows for the most efficient use of the spectrum during the transition from 2G to 3G. However, to ensure this proposal works in practice, operators transitioning from 2G to 3G will need:

- at least 2x10MHz contiguous spectrum to allow the 3G channel to be placed centrally; and

- to commit to an agreement on interference management.

In addition, to ensure that this proposal works in practice, and as discussed in the answers to Questions 2, 6 and 10, only technologies identified in the Annex to the EC's Liberalisation Decision[39] should be licensed.

13. Do you support Option A? Please provide supporting arguments with your answer.

Please see Meteor's response to Question 4, which explains why all three of ComReg's proposals to retract and auction off the existing 900 MHz licenses are inherently unfair, contrary to the public interest, and incompatible with the basic objectives and requirements of the applicable regulatory framework.

Option A proposes to have multiple award processes with corresponding assignment of spectrum. There would be three sequential licence competitions which would gradually release seven 2x5 MHz blocks of 900 MHz spectrum. Assignment would then be phased in as spectrum was reassigned following expiry of existing licence terms. All new licences would have the same expiry dates.

Although Option A is generally objectionable for the reasons discussed in response to Question 4, this variation would be disproportionately prejudicial to Meteor. The phased nature of the envisaged auctions would create unacceptable levels of uncertainty during the period from adoption to 2013, since the process would place in question the ability of Meteor to secure sufficient amounts of 900 MHz spectrum to facilitate the transition to 3G, or indeed sufficient spectrum to maintain a competitively viable business. The uncertainty created by this proposal will also impact on Meteor's ability to secure sufficient investment in the period up to 2013, thus weakening the competitive pressure that Meteor can bring to the Irish mobile market.

Additionally, Option A falls considerably short of promoting technical efficiency as there exists a very real possibility that the spectrum assigned would not be contiguous. Contiguous spectrum is necessary in the longer term to leverage the benefits of 3G LTE. Moreover, in the medium term, during the transition to 3G, access to contiguous spectrum will be important in controlling inter-system (GSM / WCDMA) interference in an efficient manner. Option A could therefore lead to a technically inefficient outcome.

Even if all existing licensees ultimately secured 2x10MHz of spectrum at auction, only one operator would have certainty of access to a contiguous block prior to 2013, thereby conferring on it an unfair advantage over the others and distorting the competitive landscape. A non-contiguous spectrum assignment would also require the use of repeaters that amplify a single section of the band and would not be economically viable.

Option A is therefore unacceptable.

[39] ComReg Doc. No. 08/57, Annex D.

14. Do you support Option B? Please provide supporting arguments with your answer.

Please see Meteor's response to Question 4, which explains why all three of ComReg's proposals to retract and auction off the existing 900 MHz licenses are inherently unfair, contrary to the public interest, and incompatible with the basic objectives and requirements of the applicable regulatory framework.

Option B would involve a single licence competition for the entire 900 MHz band in 2009, followed by a phased assignment process. The entire 900 MHz band would be divided into seven 2x5 MHz blocks, with an auction for the entire block being held in mid-2009. Assignment would be in accordance with the different expiry dates of existing licences.

ComReg asserts that this method of reassignment would increase efficiency by releasing unused spectrum and would potentially reduce the likelihood of stranded or unused blocks. Although for this reason Option B may be seen as a marginal improvement over Option A in this one respect, Option B is nonetheless fundamentally flawed and would produce the same inefficiencies, inequities and potential disruptions as Options A and C.

15. Do you support Option C? Please provide supporting arguments with your answer.

Please see Meteor's response to Question 4, which explains why all three of ComReg's proposals to retract and auction off the existing 900 MHz licenses are inherently unfair, contrary to the public interest, and incompatible with the basic objectives and requirements of the applicable regulatory framework.

Under Option C, ComReg proposes to reserve up to two Blocks (Blocks A and B) for new entrants to the 900 MHz band.

ComReg recognises that this proposal substantially increases the probability that one or more of the existing licence holders will be unsuccessful in securing continued rights to the 900 MHz spectrum beyond the period of its current licence. However, ComReg appears to consider this eventuality both a benefit and a drawback of Option C.

That ComReg would consider adopting a spectrum award process which effectively discriminates against existing licence holders, without any claim of licence breach or non-use of the spectrum, is extraordinary. This is not a game of musical chairs. The existing licensees have made and continue to make substantial investments in their mobile networks. The Irish mobile industry is ahead of most other countries in Europe in the roll-out of advanced mobile services for a reason[40]. Although all three options hold out the prospect of impeding this impressive progress, ComReg's

[40] Head of Analysys Mason Ireland, Pat Kidney, interviewed by Gordon Smith in Irish Independent. 7th August 2008. "Faster services and lower prices herald mobile broadband arms race".

consideration of Option C would seem to suggest that its priority may be to maximise proceeds from the licence refarming process rather than to foster sustainable competition and innovation. In Meteor's view, this would be wholly incompatible with the letter and spirit of applicable laws and regulations.

In every other democratic country of which Meteor is aware, in the absence of material performance or compliance issues, the existing mobile network operators have been granted automatic licence renewals and, in many cases, priority in respect of complementary frequency assignments when additional spectrum has become available. It would be unfair, discriminatory and disproportionate for ComReg to put the businesses of the existing mobile network operators at risk by adopting an award process that is stacked against them. It would also expose Irish consumers to potentially severe disruptions in their service, the cost and inconvenience of which ComReg has failed to consider or analyse fully.[41]

ComReg therefore should abandon Option C along with Options A and B.

16. If you agree with Option C, do you have views on the number of blocks that should be potentially reserved for new entrants? Please provide supporting arguments with your answer.

Meteor does not accept that Option C is an appropriate, reasonable or proportionate basis on which to reassign spectrum rights or promote the more liberalised use of spectrum. With an aggregation cap of 2x10MHz per operator, as proposed by the Consultation document, there would be scope for at least one new entrant to operate in the 900 MHz band.

Without prejudice to our rejection of Option C, there could be no justification for more than one block being reserved, particularly as it would guarantee that at least one existing operator could not cost effectively have access to the 900 MHz band.

17. Do you believe that there are other viable options that ComReg should consider? If so please explain these options in detail with supportive arguments

For the reasons set forth above in response to Questions 4, 14, 15 and 16, Meteor does not consider any of the options (A to C) proposed by ComReg to be viable. Indeed, as demonstrated above, each of the proposed options is incompatible with the requirements of the Communications Act,[42] the Framework Regulations and the Authorisation Regulations.

From Meteor's perspective, the optimal and most efficient solution would be for ComReg to make a direct assignment of 2x11.6 MHz to each existing licence holder (ideally incorporating their existing assignments). However, Meteor is of the view that there is a viable compromise that is objectively non-discriminatory, transparent and proportionate under the circumstances. It also has the important benefit of

41 See Section B.5 above.

42 Communications Regulation Act, 2002.

minimising the regulatory uncertainty associated with the future licencing of the 900 MHz spectrum, in sharp contrast to proposed Options A-C. The solution respects current spectrum assignments and existing licence holders' legitimate expectations, whilst also allowing for an immediate release of currently unassigned spectrum and the gradual release of additional spectrum over time.

Under Meteor's compromise proposal, an assignment of 2x10 MHz would be made to the existing licence holders by expanding each operator's usage rights to cover contiguous 2x10 MHz block which includes as far as possible their current spectrum assignments. This could mean the following direct assignment of blocks: Meteor - 930-940/885-895MHz, Vodafone - 940-950/895-905 MHz; O2 - 950-960/905-915 MHz. The remaining 2x5 MHz of currently unassigned spectrum could be assigned to a new entrant to the band at the earliest opportunity either through auction, a comparative selection process, or administrative assignment.

As demand for GSM services gradually declines, the need to maintain spectrum for both GSM and 3G services will diminish. Once this point is reached, operators could agree to a realignment of all spectrum allocations, each with a 5MHz assignment allocation, which then would enable ComReg to re-assign spectrum access rights to the remaining vacated spectrum by means of either auction or a comparative assessment.

This option balances ComReg's preference for supporting new entry in the 900 MHz band with the need to assure existing operators of the availability of 2x10 MHz of the 900 MHz band to reduce costs and minimise customer disruption during the transition from 2G to 3G.

To ensure an efficient allocation of spectrum assigned directly over time, spectrum in the 900 MHz band should be priced based on the estimated marginal opportunity cost of spectrum. It is the opportunity cost of spectrum at the margin and not the total value of the spectrum that should be the basis of any valuation-related spectrum fees. Efficient resource use is promoted when prices reflect the opportunity cost.[43] In the case of spectrum the opportunity cost is the value of the opportunity forgone by current spectrum use, *i.e.* the value of the next best alternative use or user of the spectrum.[44] This is the price at which supply and demand for spectrum are balanced.

The price would need to be determined for the blocks that are directly assigned. This could be done in two ways:

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[43] It can be shown that subsidising inputs is inefficient and that policy should be focussed on outputs. This is discussed in "An Economic Study to Review Spectrum Pricing", Indepen, Aegis Systems and Warwick Business School, Ofcom, February 2004. http://www.ofcom.org.uk/research/radiocomms/reports/independent_review/spectrum_pricing.pdf Peter Diamond and James Mirrlees (1971) "Optimal taxation and public production 1: Production Efficiency and 2: Tax Rules", *American Economic Review*, Vol. 61

[44] Opportunity cost prices were advocated in Professor Martin Cave's 2002 Independent Spectrum Review. http://www.ofcom.org.uk/static/archive/ra/spectrum-review/2002review/1_whole_job.pdf

- Determined by ComReg following a full review to establish the estimated marginal price of the block of spectrum; or

- Determined by the price yielded by auction of the vacant spectrum, which could be used as a reference in respect of the annual fees that would apply to other blocks within 900 MHz. Appropriate adjustments would need to be made taking into account that the auctioned block is clear spectrum available for use anywhere in Ireland. The existing operators, by contrast, will be significantly constrained in their ability to deploy 3G services at 900 MHz nationwide.

18. Do you agree with ComReg's assessment that there is insufficient demand for 1800 MHz spectrum assignments to warrant holding a competitive process at this time? Please provide supporting arguments with your answer.

In order to fully respond to this question, Meteor would welcome visibility of the basis for ComReg's assessment. Section 9 of the consultation contains several observations in this regard but no substantiation is provided. ComReg states that it has seen very little demand expressed to date for spectrum in the 1800MHz band, but ComReg has provided no data to support its assertion.

As ComReg notes in section 9.2 of the consultation document, new wideband systems (LTE) are expected to become available by 2012. This will allow for the further evolution of mobile services and competition more generally. A coherent and strategic approach to the management of mobile spectrum is required in order to enable Irish consumers to benefit from these developments at the earliest opportunity.

For many of the reasons stated above in respect of 900 MHz, Meteor believes there is a legitimate case for the current 1800 MHz assignments to be liberalised and renewal rights established. This should be completed in advance of 2012.

In the medium to long term, the 1800 MHz band could offer an extra capacity layer for 3G WCDMA alongside the existing 2100 MHz band in high-traffic urban areas. Depending on the success of services such as mobile broadband, contention rates may reduce service quality for individual users if operators are forced to rely solely on the 2100 MHz band.

15 MHz of 1800 band could offer peak rates of over 100 Mbit/sec and, more important, extra capacity. This would result in reduced contention between users. 1800 MHz cells in urban areas offer better control of coverage footprint (thus less interference) compared to 900 MHz due to narrower vertical beamwidth of antennas and thus may be more preferable to be utilised in some more dense urban areas instead of 900 MHz.

In practice, therefore, a mix of both bands may be needed and used depending on coverage requirements.

19. Do you agree that the holding of a spectrum award process for 1800 MHz spectrum circa 2013 would be appropriate? Please provide supporting arguments with your answer.

As discussed in our response to Question 18, the establishment of renewal rights for the existing 1800 MHz licences should be completed in advance of 2012. Otherwise, our response to this question is essentially the same in principle as for 900 MHz (see response to Question 17). That is, upon expiry of the terms of the extant 1800 MHz licences, the licences should be renewed or reinstated in the absence of sound reasons for retracting them (*i.e.*, material breach or non-use). ComReg should award the unassigned spectrum in this band subject to a procedure that is likely to be efficient and in the public interest – including the public interest in promoting investment, innovation and non-disrupted service. This could be by means of direct assignment, a comparative selection process, auction or other proportionate, objective and transparent process.

20. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2x5 MHz for future 1800 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Prima facie, this appears to be appropriate. However, the appropriate time to resolve policy issues in this respect would be in the context of a package of measures to introduce liberalisation and renewal rights to this band. In any event, given the speed at which technology and service developments are occurring in the mobile industry, it would not be prudent to take any firm decisions on the minimum block size at this time.

Additional Issue: ***Coverage and Quality of Service Requirements***

In the section of the consultation following Question 8 (section 7.3.3), ComReg states its intention to maintain coverage and quality of service requirements similar to those contained in the current licences. However, no specific question requesting comment on this issue is posed by the consultation document.

ComReg's justification for maintaining the currently applicable coverage and roll-out obligations is "to ensure the most efficient use is made of spectrum and that no geographic divide emerges in the provision of consumer services utilising 900 MHz". Although Meteor recognises the important public interest objectives underlying these requirements, they are nonetheless significant obligations which should be retained only if absolutely necessary.

Over the near term, Meteor does not object to the continued application of these requirements. Over time, however, as spectrum management moves towards full liberalisation with the advent of secondary trading and other measures, the need for prescriptive coverage and quality of service requirements of this nature will no longer exist as the very essence of liberalisation is to inject greater flexibility into spectrum licensing and use.

With liberalisation of the 900 MHz band to include UMTS, however, the application of these measures to a particular spectrum band is neither efficient nor practicable. All mobile network operators in Ireland will be utilising multiple frequency bands (900 MHz, 1800 MHz, 2100 MHz and potentially other bands in future) to provide a suite of mobile services. Consumers are indifferent to the frequency over which these services are delivered. Their primary concern is the availability of the service they require at a particular location.

Consequently, Meteor recommends that the proposed service-related coverage obligations should be made frequency-neutral, and their continued application should be reconsidered when the licences are modified to include secondary trading rights.

6 Qualcomm Europe Inc

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Ms. Sinead Devey

Commission for Communications Regulation
Irish Life Centre
Abbey Street
Freepost
Dublin 1
Ireland

Rome, 11th September 2008

Dear Ms. Sinead Devey

Qualcomm response to the consultation paper on liberalising the use of the 900 MHz and 1800 MHz spectrum bands

Qualcomm welcomes the opportunity to respond to the consultation regarding "*the liberalisation of the 900 and 1800 MHz bands*".

Qualcomm highly appreciates and supports ComReg's proposal to liberalise the 900 MHz and 1800 MHz bands to allow their use by UMTS.

3G Mobile Broadband is crucial for a sustainable economic growth. Therefore, Qualcomm believes that citizens' best interest lies in ensuring the rapid deployment and coverage extension of networks. The refarming of the 900 MHz band is required, as early as possible, to enable its use for 3G. Indeed, UMTS900 provides the opportunity to expand 3G mobile broadband into the smaller towns, villages and rural areas, in an economically efficient manner which is essential for Ireland digital inclusiveness. UMTS900 also improves indoor coverage in all areas, including cities. Having 3G mobile broadband wireless operators with nationwide and improved indoor coverage, as a competitive alternative to wired providers, further enhances competitiveness and broadband development.

Mobile broadband connections based on available 3G networks have considerably increased over the past year in several countries globally and in Ireland in particular. This take-up can be associated to the large availability of mass-market equipment and the associated benefits

(internet access in mobility). The liberalisation of the 900 MHz spectrum will sustain the successful development of those services.

Qualcomm's detailed responses to the proposals put forward in the public consultation are further detailed in the Annex. Wassim Chourbaji (*email*: wassim@qualcomm.com, *phone*: +33620386431, *address*: 40 rue d'Oradour sur Glanne, Paris, France) remains available for any further information you may request regarding this response.

Sincerely yours,

Isabella de Michelis di Slonghello
Head of Government Affairs, Europe and MENA
idemiche@qualcomm.com

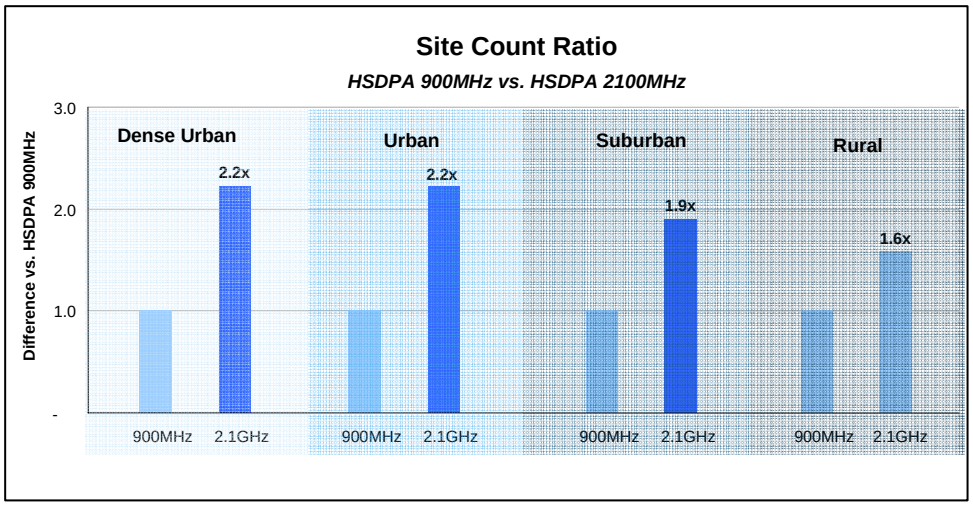
ANNEX

Qualcomm response to the consultation paper on liberalising the use of the 900 MHz and 1800 MHz spectrum bands

Q. 1. Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions (see below)? Please provide supporting arguments with your answer.

As the mobile industry in Europe expands from GSM/GPRS/EDGE for voice with a limited data user experience towards WCDMA/HSPA offering greater capacity, faster data rates, shorter download times and lower costs, the refarming of the 900 MHz and 1800 MHz is becoming increasingly important.

Wide area mobile internet access has been recognized as a key for economic national competitiveness and reduction of the digital divide between urban and rural areas. UMTS900 provides the opportunity to expand 3G mobile broadband into the smaller towns, villages and rural areas, in an economically efficient manner. UMTS900 also improves indoor coverage in all areas, including cities. Having 3G mobile broadband wireless operators with nationwide and improved indoor coverage, as a competitive alternative to wired providers, further enhances competitiveness and broadband development.



The deployment of UMTS in the 900 MHz band is gaining momentum in Europe and around the world. According to the Global Mobile Suppliers Association, 20 user devices have been announced from 6 manufacturers, three commercial UMTS900 networks have been launched in Finland, Estonia and Thailand and four others are under deployment in Australia, New Zealand and Iceland.

Qualcomm strongly supports the refarming of the 900 MHz spectrum as soon as possible, as it will enable consumers to benefit from mobile broadband services in a cost efficient manner, enhances competitiveness and broadband access to rural areas. Other countries in Europe such as France, Italy or Finland acknowledged those benefits and have already decided to allow 900 MHz operators to deploy UMTS900.

Mobile broadband connections based on available 3G networks have skyrocketed in several countries. This take-up can be associated to the large availability of mass-market equipment and the associated benefits (internet access in mobility). The refarming of the 1800MHz band will provide additional capacity to operators in order to respond to the expected surge of traffic volume.

Q. 2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Qualcomm believes that a spectrum policy framework based on technology neutrality through standards competition, application neutrality and pan-European implementation of harmonized technical spectrum usage rights enables an efficient use of spectrum, innovation, competition and the successful commercial development of wireless technologies in Ireland and in Europe.

With regards to service neutrality, Qualcomm considers that there is a need to distinguish between application neutrality (e.g. voice, data, video services …) and 'radio' service neutrality (Uplink / Downlink bands, High power / Low power …). While Qualcomm supports the principle of application neutrality as it is an important policy to cope with innovation and convergence in the wireless world, we believe that 'radio' service neutrality would lead to an increased risk of interference and inefficient use of spectrum and should therefore be avoided. Irrespective of what standards or services that may be deployed, a common and harmonized

band plan reduces the risks of interference and facilitates economies of scale, which in turn brings benefits to consumers and citizens. Qualcomm supports the work of the CEPT to provide harmonized technical spectrum usage rights which enable efficient use of the spectrum and affordable equipment availability through economies of scale.

Q. 6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

As detailed in the response to Question 2 regarding the implementation of a service neutral licensing in existing 900 MHz spectrum assignments, Qualcomm believes that a better definition of service neutrality is required. Indeed,
Qualcomm considers that there is a need to distinguish between application neutrality (e.g. voice, data, video services …) and 'radio' service neutrality (Uplink / Downlink bands, High power / Low power …). While Qualcomm supports the principle of application neutrality, we believe that 'radio' service neutrality would lead to an increased risk of interference and inefficient use of spectrum and should therefore be avoided.

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Q. 10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

Qualcomm supports technology neutrality on the basis of standards competition as it enables competition between standards. While UMTS900 has been available for some time, consumers have been deprived from its benefits due to the lack of technology neutral access to the 900 MHz band. Technology neutrality will enable operators to offer the latest technical innovation to consumers. On the other hand, Qualcomm supports pan-European implementation of harmonized technical spectrum usage rights for Electronic Communication Networks, as developed by the ECC, in order to obtain both the economies of scale achievable through harmonization with the innovation delivered by technology neutrality as well as a to ensure spectrum compatibility between operators and between various services. With regards to the 900 MHz band, the ECC has produced two reports related to compatibility issues for the introduction of UMTS in the 900 and 1800 MHz bands alongside GSM. ECC Report 82 studies the compatibility for UMTS operating within the GSM 900 and GSM 1800

frequency bands.[1] This report concludes that UMTS900/1800 networks can be deployed in urban, sub-urban and rural areas in co-existence with GSM900/1800 networks by using appropriate values for carrier separation. ECC Report 96 studies the compatibility between UMTS900/1800 and systems operating in adjacent bands[2].

Taking into account the above, Qualcomm believes that ComReg should allow the use of the 900 MHz for GSM and UMTS systems only at this stage, while leaving the door open for future technologies to be introduced in this spectrum subject to the completition of the compatibility studies at CEPT level.

Q. 11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2x5 MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

As UMTS900 terminal penetration will rise, GSM900 requirement will decrease and GSM900 will be slowly shifted out. UMTS900, i.e. WCDMA and its evolutions (HSDPA, HSUPA, HSPA+), operates on 5 MHz channels. In addition, 5 MHz channels are consistent with the spectrum usage rights developed by CEPT in other WAPECS bands such as the 2500-2690 MHz band.

Therefore, Qualcomm supports block size to be 2x5MHz in the 900 MHz band.

Q. 12. Do you agree with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Qualcomm believes that the compatibility between GSM and UMTS has been appropriately addressed by CEPT (ECC Report 82) which provides the necessary guidelines for operators to coordinate among themselves to either implement a standard carrier separation of 2.8 MHz between a UMTS network and a GSM network or a smaller carrier separation, if they wish so, taking into account actual UMTS and GSM equipment performances.

[1] ECC Report 082, "Compatibility study for UMTS operating within the GSM 900 and GSM 1800 frequency bands," http://www.ero.dk/documentation/docs/doccategory.asp?catid=4&catname=ECC/ERC/ECTRA%20Reports
[2] ECC Report 096, "Compatibility between UMTS 900/1800 and systems operating in adjacent bands + Appendix 'SMC scenario for GSM-R'", http://www.ero.dk/documentation/docs/doccategory.asp?catid=4&catname=ECC/ERC/ECTRA%20Reports

With regards to technologies than UMTS or GSM, Qualcomm believes that appropriate studies should be undertaken at CEPT level first.

Q. 20. Do you agree with ComReg's view that the minimum spectrum block size should be 2 x 5 MHz blocks for future 1800 MHz assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

As detailed in the response to Question 11, regarding the 900 MHz band, Qualcomm supports block size to be 2x5MHz in the 1800 MHz.

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7 Telefonica O2 Ireland

Liberalising the use of the 900MHz and 1800MHz Bands

Response to Consultation Document 08/57

30 September 2008

Confidentiality statement

This is a non-confidential version of O2's response to ComReg's consultation document. Certain confidential information has been removed and replaced by the following symbol **[ ]**.

1. Executive summary

This is the most important topic that ComReg has consulted on in recent years, with implications for consumers, operators, and investment in the electronic communications sector in Ireland. The consequences of the decisions taken following this consultation will be significant, and ComReg must carefully measure all of the possible options before deciding how to proceed. If the wrong decisions are taken at this time, it will cause disruption and unnecessary cost to both consumers and operators.

ComReg is right to conduct a consultation at this time on the subject, however there are many aspects to the consultation and it is O2's belief that insufficient time has been given to consider the issues adequately. ComReg has not considered all of the available options yet. Further consultation is warranted before ComReg proceeds to spectrum assignment.

Effective and stable mobile communications is now an essential part of day-to-day life for most people and business in Ireland. ComReg's own estimate is that mobile communications contributes €1.4 billion per annum to the Irish economy, or 1.67% of GDP. More voice minutes are now carried on mobile networks in Ireland than on fixed, and mobile is also making a significant contribution to broadband availability with 21% of connections and rapid growth. The availability of mobile communications is now taken for granted. Any disruption to the continued availability of, or investment in this part of the communications sector would be disruptive for consumers and damaging for the Irish economy.

The 900MHz band, as it is used today for GSM services, is the primary carrier for the majority of the mobile voice service calls made each day. It provides service to a significant part of the population who are outside of 3G coverage, and even within 3G areas it still carries the majority of the voice traffic. There is currently no alternative that could be available and capable of carrying this traffic if O2 (or Vodafone) was required to vacate 900MHz spectrum in 2011. ComReg must ensure that this does not occur.

Since O2 launched its service in 1997, it has continually developed and invested in its business, and has just completed an upgrade of both its GSM and 3G networks. O2 now provides service to 1.7 million customers. Its GSM services are available to more than 99% of the population, and a superior mobile broadband service is provided to more than **[ ]** users. O2 has invested over **[ ]** in Ireland over the past six years, and contributes in excess of €0.5 billion annually to the Irish economy. O2 is the leading supplier of mobile communications for business in Ireland; it employs 1,600 people in Ireland; and participates in many aspects of Irish life outside of its core business area. O2 has a significant stake in Ireland and

the continued successful operation of its business is dependant on retaining 900MHz spectrum.

A large body of legislation governs the manner in which spectrum is allocated. This ranges from the Wireless Telegraphy Act to the Communications Regulation Act, to the regulations which bring the 2002 regulatory framework into effect in Irish law. This framework defines the objectives, considerations, and procedures which ComReg must take into account when assigning spectrum. The principle requirements are that decisions must be transparent, proportionate, objectively justified, and must consider the implications for all users of the spectrum.

O2 has examined the three options proposed by ComReg and finds that none of them meets the requirements of the regulatory framework in relation to spectrum management. In all three cases, existing network operators are placed at risk of losing spectrum in the 900MHz band, either partially or entirely. However no analysis has been carried out to determine the impact this would have on existing operators or consumers. If this were to occur, it would have a significant negative impact on O2's business and service, which would be disproportionate.

The options proposed also leave existing operators open to "strategic bidding" whereby the price paid by existing operators is artificially increased above the market-clearing price. To varying degrees, the options as proposed would create an inefficient outcome from the assignment process.

O2 can propose an alternative process for liberalisation of the 900MHz band and allocation of free spectrum. The process proposed will minimise disruption for consumers, protect existing operators and ensure spectrum is available for new entrants if required. It is efficient, and will also allow the introduction of new services.

In summary, it is proposed that ComReg should:

- allocate all of the spectrum in the band in a single process
- auction spectrum in blocks of 2×2.5MHz
- reserve spectrum for three existing operators in the band (2×7.5MHz each)
- include an initial spectrum cap of 2×10MHz per operator for a limited period only
- assign the spectrum using a two-stage process in which the quantity of spectrum assigned to each operator is determined first, and then the position within the band

There are a number of other features of the process proposed, which are explained further in the main document below.

There are many uncertainties concerning demand for the 1800MHz spectrum, including decisions yet to be made regarding the Digital Dividend, the 2.6GHz band, and the availability of LTE equipment. O2 agrees that ComReg should not propose an assignment process now,

however should not close off availability of spectrum in this band until 2013. ComReg should liberalise the current assignments and internalise the guard bands to make the current assignments 2×15MHz each.

O2 sets out its response to the consultation in this document, which is structured as follows:

Section 2. Background
Section 3. Issues regarding the 900MHz re-farming process
Section 4. Legislative requirements
Section 5. Practical implications of the legislation
Section 6. Proposed method for assignment of 900MHz spectrum
Section 7. Response to questions.

2. Background

2.1 Mobile communications in Ireland

Effective and stable mobile communications is now an essential part of day-to-day life for most people and businesses in Ireland. ComReg's own estimate is that mobile communications contributes €1.4 billion per annum to the Irish economy, or 1.67% of GDP. The latest report on Key Market Data issued by ComReg[1] shows the important role existing mobile services play in the Irish economy, and also indicates the value that is being provided to consumers:

- mobile networks carried 55% of all voice minutes, fixed 45%
- mobile networks accounted for 44% of sector revenue, fixed 52%
- mobile networks provide 222,330 broadband connections and is the most rapidly expanding with growth of 20% during the quarter

Voice and text continues to be critical for mobile users – voice alone still accounts for 76% of mobile revenues, and the volume of voice minutes carried is growing rapidly.

There are now 5.2 million mobile subscriptions (120% penetration). Further, the market continues to be competitive. In this quarter, average revenue per user declined by 6%, while the volume of minutes carried grew by 12% since the previous quarter.

The benefit that mobile communications has brought to daily life goes far beyond what is captured in the statistics above. It is now accepted as an integral part of the way in which we organise our lives and our business, and for the majority of people, both are completely dependant on an effective and ubiquitous service. Any disruption to this service would be harmful to consumers.

2.2 Investment in electronic communications markets

Though it is almost a cliché within the electronic communications industry that it is a "fast moving and rapidly changing environment", it is nonetheless true in the case of mobile. Some network elements, products, and services can have a relatively short life span. Mobile service requires a high level of ongoing investment.

Ireland and Irish operators must compete to obtain that investment by providing a competitive return with minimum risk. All major operators in the communications sector in Ireland are part of a larger international group and must compete in this way for investment. To win investment, operators must be able to show that the regulatory environment favours sustainable investment.

[1] ComReg document 08/75, data to end Q2 2008

In its third Facts and Figures report issued recently[2], ETNO sounded a note of caution. The report shows a softening of investment in the communications sector in Europe, and the ETNO chairman warned that continued investment is needed for innovation, but that uncertainty regarding regulatory intervention may be causing financial markets to prefer investment outside of Europe.

O2 is part of the Telefonica Group and must compete for investment against operating businesses in other countries around the globe. Many of those countries show greater growth in their mobile communications markets than Ireland, and contend vigorously for investment. Any increased regulatory risk or significant operational disruption for O2 Ireland would have a direct impact on its ability to attract future investment.

2.3 O2 Ireland

O2 brought competition and choice to the Irish mobile market in 1997 when it used 900MHz spectrum to become the first competitor to what was then the state-owned monopoly service provider. The service has been continually developed since then, and we have just completed an upgrade of both our GSM and 3G networks.

O2 provides mobile services to 1.7 million customers. Its GSM services are available to more than 99% of the population, and a superior mobile broadband service is provided to more than **[ ]**. O2 has invested over **[ ]** in Ireland over the past six years, and contributes in excess of €0.5 billion to the Irish economy annually. O2 is the leading supplier of mobile communications for business in Ireland; it employs 1,600 people in Ireland; and participates in many aspects of Irish life outside of its core business area. O2 has a significant stake in Ireland and will be affected by the decisions that ComReg make in relation to the 900MHz band.

2.4 Spectrum availability in Ireland for future services

There are a number of external factors that serve to increase the uncertainty surrounding the optimum long-term use of the 900MHz band. As previously mentioned, the mobile world is ever changing, and the industry works several years in advance to plan for subsequent generation services.

Vendors are already working on the Long Term Evolution (LTE) mobile standards, and regulators are assigning spectrum in the 2.6GHz band for this standard. For optimum operation, LTE requires up to 2×20MHz block allocations. In Ireland, the future of the 2.6GHz band is unclear, and will require a specific consultation for ComReg to provide clarity.

[2] http://www.etno.be/Portals/34/ETNO%20Documents/Facts%20%20Figures_final.pdf

The Digital Dividend spectrum may also potentially be available to provide mobile services. Together with the 900MHz band, this spectrum may provide an opportunity for operators to aggregate sufficient assignments in the low frequency bands for future high-speed services. Clarity will be required regarding the availability of this band and also on whether there will be a European standard band to ensure mass-market equipment.

2.5 Regulator's change of position on extending existing 900MHz licences

In 2001, when the Regulator (then ODTR) was preparing for the 3G licence competition, it was clearly envisaged that existing 900MHz licences could be extended to the same expiry date as the 3G licences. This is stated explicitly in section 4.2 of the Information Memorandum[3], which states:

> "Continued availability of existing spectrum assignments in the 900 MHz and 1800 MHz bands to mobile telecommunications licensees will be reviewed three years prior to licence expiry. Retention of such spectrum will be on a demonstrable need basis until the end date of the 3G licences"

ComReg would appear to have changed its position in relation to this point, as no reference has been made to the retention of existing assignments in ComReg's consultation document. ComReg should explain if it has changed its position in this regard, and if so, why.

As previously stated, O2 has invested in and developed its network continually since 1997. A major upgrade to the access network, including GSM at 900MHz has just been completed. O2 reasonably expected that 900MHz spectrum would continue to be available; its withdrawal would render this investment lost.

[3] ODTR document 01/96

3. Issues regarding the 900MHz re-farming process

ComReg is consulting on the options available for the 900MHz band at this time for a number of reasons:

- In 2007, the EC Radio Spectrum Committee approved a final draft decision that would 'liberalise' the 900MHz and 1800MHz bands
- The current 900MHz licences issued to O2 and Vodafone have expiry dates in mid-2011, and ComReg wishes to provide security to ensure continued investment and avoid disruption for consumers
- There is currently 2×12.8MHz of spectrum unassigned in the band and a demand exists to make it available for service provision.

O2 agrees with ComReg's decision to consult on this subject at this time – there are many complex and interrelated aspects to be considered. However, given the importance of the consultation for future investment, and the potential disruption and loss of consumer welfare, ComReg must give due consideration to all of the options available. This will require conducting Regulatory Impact Assessments where necessary.

All reasonable options have not yet been considered by ComReg, and alternatives will be suggested in response to this consultation. O2 does not believe adequate time has been given at this stage of the process, and that a second consultation will be required to include a more thorough impact assessment before commencing an assignment process.

3.1 Technology neutrality

O2 agrees with ComReg's proposal to move to technology and service neutral licences in the 900MHz band, provided of course that existing services are protected from interference. Consumers stand to benefit, in particular if operators were permitted to introduce 3G service using the 900MHz band. The benefits for consumers will be greatest if operators with existing 900MHz networks can introduce 3G service on existing infrastructure – this is the fastest and most efficient way to bring mobile broadband service to consumers who are outside of current 2.1GHz coverage areas.

3.2 Impact of operators losing 900MHz spectrum

In ComReg's consultation paper on liberalising the use of the 900MHz and 1800 MHz spectrum bands, the three proposed options fail to take account of existing use of the spectrum by current licensees. All of the options expose existing operators to the potential loss of 900MHz, which would have significant impact on both their national operations, and on Ireland's consumers.

At present, [ ] of O2 subscribers or [ ] consumers use GSM only handsets. If O2 was to lose all or part of its spectrum allocation in May 2011, it would result in considerable disruption being caused to these customers. It would take several years for the profile of handsets in the user-base to have changed sufficiently that switch off of GSM 900 could be contemplated without disrupting a significant number of customers. This will not be possible before mid-2011. By the time the outcome of the assignment process is known, there will be insufficient time for O2 to build replacement coverage using alternative spectrum. Furthermore, O2 believes it would never be feasible to entirely replicate the current GSM coverage using higher frequency spectrum. Apart from the difference in propagation characteristics, O2's current GSM network is designed for 900MHz operation. Many sites would not be appropriate for use at an alternative band, and would need to be decommissioned, with associated costs. This would be an inefficient outcome from ComReg's assignment process. And would have a disproportionate impact on O2.

The 900MHz band (GSM) still carries the vast majority of voice traffic and provides coverage to almost 100% of the population. There are only two networks that provide this degree of coverage in Ireland, that of O2 and Vodafone. Current 3G networks (in the 2.1GHz band) only reach 90% population and may not provide equivalent quality of coverage to that of the 900MHz service throughout all of the 90% coverage. At present, both Meteor and 3 Ireland rely on national roaming to provide nationwide service. The critical importance of national service was demonstrated by Meteor, who did not gain a firm position in the market until the first national roaming agreement was implemented.

As discussed above, if O2 was to lose its 900MHz spectrum allocation, it would not be possible to find an alternative means to continue to serve customers before licence expiry in mid 2011. O2 does not believe that the other networks would be capable of absorbing O2's traffic. This is particularly the case in rural areas, where the Vodafone network would be the only network providing coverage. We do not expect that any new entrant would rollout to the equivalent population coverage, at least in the short to medium term. O2 believes there would be a similar outcome if Vodafone were to lose its spectrum allocation in the auction proposed in 2009.

The loss of 900MHz spectrum would result in the deterioration in quality or availability of service to the extent that it would no longer be useable by significant portion of current customers. The consequences would be significant to the users impacted, affecting both businesses and consumers. However the worst impact would be felt by those outside of the main urban centres where current 3G coverage is not available.

Such a scenario would also have a material negative effect on O2's business in Ireland. It would incur cost through disruption, provision of alternative means to service customers, and loss from early decommissioning of the 900MHz network. This would make it difficult to compete for future funding and therefore impact investment in mobile services in Ireland.

O2 needs to retain a minimum of 2×7.2MHz in the 900MHz band for the continued operation of its GSM service. A minimum of 2×10MHz would be required in order to introduce 3G service in this band. This would allow for the parallel introduction of 3G, and migration of customers from GSM to 3G without loss of service.

3.3 Market entry and competition

ComReg has an objective to ensure that markets are competitive, and this has been cited as part of the considerations in deciding how to approach the liberalisation of the 900MHz and 1800MHz band. ComReg has included in Annex F to the consultation document an examination of the welfare benefits of market entry/exit. O2 believes the mobile communications market is already competitive and has serious doubts that a sustainable business case exists for a new market entrant.

O2 has asked Analysys Mason to examine the rationale for reserving spectrum in the 900MHz assignment process for new entrants. As part of the examination, they have considered the business case for a new market entrant and found that it is difficult to make a convincing case that a new entrant would bring sustainable benefits. This issue has previously been examined by the NRA in both France and The Netherlands. In France, the ARCEP invited expressions of interest from operators interested in using 900MHz spectrum, but found no credible proposal was received. In the Netherlands the market was examined and considered to be effectively competitive. On that basis, it was decided that there was no need to use expiry of 900MHz licences to attempt to orchestrate market entry. ComReg seems to have assumed that promoting market entry (in this case by discriminating against existing operators) is equivalent to ensuring the market is competitive.

4. Legislative requirements

ComReg's functions and objectives in managing the radio frequency spectrum are specified in several pieces of legislation, together with the considerations and procedures required.

These include, but are not limited to:

- Wireless Telegraphy Act 1926, as amended
- Communications Regulation Act 2002 as amended
- The EU wide regulatory framework as specified in Directives 2002/19/EC, 2002/20/EC, 2002/21/EC, and 2002/22/EC
- The Regulations which give them effect in Irish law, Statutory Instruments 305 of 2003, 306 of 2003, 307 of 2003, and 308 of 2003

Also directly relevant are the Ministerial Policy Directions of February 2003, given to ComReg under Section 13 of the 2002 Act.

4.1 Imposition of access conditions in general authorisation

The Authorisation Regulations, 306 0f 2003, specify ComReg's functions in relation to the authorisation of providers of electronic communications services, and licensing of spectrum. These Regulations specify what conditions may be attached to authorisations and licences, and the circumstances in which they can apply.

Regulations under which access obligations may be imposed are:

- Regulation 9 where ComReg has followed the Market Analysis procedure and made a finding of Significant Market Power
- Regulation 6 ComReg may impose the same obligations, however this is permitted only in specific circumstances and to a limited extent

This obligation may be imposed only to the extent that it is necessary to ensure end-to-end connectivity, and may not be used for broader market affecting measures including MVNO obligations.

4.2 Imposition of access conditions in radio spectrum licences

The Authorisation Regulations also specify conditions which may be imposed under radio spectrum licences, which are limited by Regulation 10.(1) to those under Part B of the Schedule. Part B of the Schedule does not include any access provision.

The Regulations do not permit the inclusion of access conditions or MVNO obligations in radio spectrum licences.

The above Regulations are consistent with the relevant Directives. It is O2's understanding that the Regulatory Framework does not permit ComReg to impose an MVNO obligation as a condition to granting a radio spectrum licence in the 900MHz band.

4.3 Functions in relation to spectrum management

ComReg's duties in relation to spectrum management are specified in a number of instruments, including:

- The Framework Regulations, S.I. 307 of 2003
- The Communications Regulation Act, 2002

The Framework regulations specify:

> 23 (1) The Regulator shall, subject to any directions issued by the Minister pursuant to section 13 of the Act of 2002, ensure the effective management of radio frequencies for electronic communications services in accordance with section 12 of the Act of 2002 and ensure that the allocation and assignment of such radio frequencies is based on objective, transparent, non-discriminatory and proportionate criteria.

The 2002 Act states:

> 10.—(1) The functions of the Commission shall be—
>
> (*b*) to manage the radio frequency spectrum and the national numbering resource, in accordance with a direction under *section 13*,
>
> 12.—(1) The objectives of the Commission in exercising its functions shall be as follows—
>
> (*b*) to ensure the efficient management and use of the radio frequency spectrum and numbers from the national numbering scheme in the State in accordance with a direction under *section 13*, and
>
> (2) In relation to the objectives referred to in *subsection (1)(a)*, the Commission shall take all reasonable measures which are aimed at achieving those objectives, including—
>
> (iii) encouraging efficient investment in infrastructure and promoting innovation, and
> (iv) encouraging efficient use and ensuring the effective Management of radio frequencies and numbering resources,
>
> 13.—(1) In the interests of the proper and effective regulation of the electronic communications and postal markets, the management of the radio frequency spectrum in the State and the formulation of policy applicable to such proper and effective regulation and management, the Minister may give such policy directions to the Commission as he or she considers appropriate to be followed by the Commission in the exercise of its functions. The Commission shall comply with any such direction.

The minister has issued two sets of policy directions to ComReg, in 2003, and 2004. They address a number of areas of ComReg's functions, and the most relevant for this consultation are contained in the 2003 Directions[4]. These include the following:

> 4. POLICY DIRECTION ON INDUSTRY SUSTAINABILITY
>
> The Commission shall ensure that in making regulatory decisions in relation to the electronic communications market, it takes account of the state of the industry and in particular the industry's position in the business cycle and the impact of such decisions on the sustainability of the business of undertakings affected.
>
> 5. POLICY DIRECTION ON REGULATION ONLY WHERE NECESSARY
>
> Where the Commission has discretion as to whether to impose regulatory obligations, it shall, before deciding to impose such regulatory obligations on undertakings in the market for electronic communications, examine whether the objectives of such regulatory obligations would be better achieved by forbearance from imposition of such obligations and reliance instead on market forces.
>
> Where the Commission has discretion as to whether to impose regulatory obligations, it shall, before deciding to impose such regulatory obligations for the purpose of the management of the radio frequency spectrum, examine whether the objectives of such regulatory obligations would be better achieved by forbearance from imposition of such obligations and reliance instead on market forces.
>
> 6. POLICY DIRECTION ON REGULATORY IMPACT ASSESSMENT
>
> The Commission, before deciding to impose regulatory obligations on undertakings in the market for electronic communications or for the purposes of the management and use of the radio frequency spectrum or for the purposes of the regulation of the postal sector, shall conduct a Regulatory Impact Assessment in accordance with European and International best practice and otherwise in accordance with measures that may be adopted under the Government's Better Regulation programme.
>
> 11. POLICY DIRECTION ON MANAGEMENT OF THE RADIO FREQUENCY SPECTRUM
>
> The Commission shall ensure that, in its management of the radio frequency spectrum, it takes account of the interests of all users of the radio frequency spectrum.

[4] http://www.dcenr.gov.ie/NR/rdonlyres/9BC3CEB7-94A3-4E39-A654-73DB85B07D45/0/Comms_Reg_Policy_Directions.doc

5. Practical implications of the legislation

5.1 Operators should not be exposed to the threat of losing 900MHz spectrum

The effect of this legislation, Regulations, and Policy Directions are to set very clear requirements on ComReg in relation to how it manages the radio spectrum. Any decision made by ComReg must:

- Ensure that any assignment or modification to assignment in the 900MHz band is based on objective, transparent, non-discriminatory and proportionate criteria
- Ensure that efficient use of the spectrum is promoted
- Ensure that sustainable investment in infrastructure is promoted
- Take account of investments made in the sector, and existing operators position in the business cycle
- Take account of all users of the spectrum, including existing operators
- Carry out a Regulatory Impact Assessment where decisions are to be taken that will have a material impact on users of the spectrum

O2 believes ComReg has not met the above requirements at this stage in the consultation process, and that further consideration will be required. In particular the three options proposed by ComReg fail to take account of existing use of the spectrum by current licensees. All three options expose existing operators to loss of 900MHz spectrum without assessment of the impact this would have on networks, investments, or end users. All three options proposed could expose existing operators to "strategic bidding" which would artificially increase the cost of any spectrum bought with resulting loss to consumers.

There are many alternative options available for the liberalisation and assignment of spectrum in the 900MHz band including several that would protect existing operators and consumers. ComReg has not considered any of these options or compared them with the options proposed.

Given the disruption that could be caused to consumers, and the impact on existing operators, ComReg is required to consider options that protect the continued operation of existing network and service providers in order to comply with its obligations under the identified legislation. Any proposal that places existing operators in jeopardy of losing 900MHz spectrum must be properly assessed in a Regulatory Impact Assessment in accordance with best practice.

O2 has a current customer base and network that require availability of 900MHz spectrum for continued operation – **[ ]** customers currently depend on this spectrum for service, and 1.7 million benefit to a lesser extent from its availability. The infrastructure put in place to service those customers does not lend itself to termination in 2011 – network equipment, backhaul, site leases, masts, etc. extend beyond that date. It

would be an inefficient outcome from ComReg's assignment process if O2 did not have continued access to 900MHz after May 2011.

O2 has requested Analysys Mason to examine the impact of a loss of 900MHz spectrum on its business. It has been estimated that O2 would suffer a loss of **[ ]** if it does not secure a minimum quantity of 900MHz spectrum in the assignment process. This represents a disproportionate outcome and would be contrary to the requirements set out in the legislation. The regulatory framework requires that ComReg protects O2 from this outcome.

5.2 O2 believes that a clear case has not been made for reserving spectrum for new entrants

ComReg has not provided adequate support to the case for reserving spectrum specifically for new entrants in the assignment process. O2 believes that new entrants should be allowed to obtain spectrum if their business plan supports it; however, to reserve spectrum for new entrants would mean that less spectrum would be available for existing operators. This can only be a desirable outcome if a new entrant can bring more benefit through use of the reserved spectrum than any other bidder.

ComReg provides analysis to show the benefit of a new entrant to the market; however O2 believes the benefits are significantly over stated. This is examined further in the annexes. However the corrected benefits of such a reservation are outweighed by the opportunity cost of this spectrum not being available for existing operators. Therefore, this option fails to meet the objective justification requirement in the legislation. No analysis whatever is provided of whether these benefits could be brought about by a new entrant using spectrum other than 900MHz.

A decision by ComReg to reserve spectrum for a new entrant, or a new entrant to the band, rather than an open auction process would need to be objectively justified. ComReg has provided no arguments or analysis in favour of reserving spectrum for a new entrant to the band, so the requirement that such a reservation be objectively justified has not yet been met.

Further, to reserve spectrum for new entrants may expose existing operators to strategic or negative bidding. If spectrum was reserved for a new entrant or a new entrant to the band, then a new entrant could bid up the price for the remaining lots far above the free market clearing price. This could be done secure in the knowledge that existing operators must continue to bid for and secure the spectrum even at excessive prices. This strategic bidding would not effect the availability of or price paid by the new entrant itself.

5.3 Precedents set in other countries

A number of other European countries have already considered both re-farming of the 900MHz band and licence term expiry. O2 examined the process in a number of these countries, and could find no case where the process would leave existing operators at risk of losing all of their 900MHz assignments. Several countries have decided to extend or renew the existing operators' licences. Some examples include:

The Netherlands

- In March 2007 the Secretary of State of Economic Affairs extended the 900 MHz GSM licences of KPN and Vodafone with 3 years until 2013. KPN and Vodafone are required to pay a fee in relation to the extension. Extension was considered appropriate because competition in the mobile market was deemed to be effective. Therefore, on balance, there was no immediate urgency for market entry as reassignment of the 900 MHz band in 2010 would have serious negative implications for a large group of consumers still relying GSM900 services.
- Source: http://www.ez.nl/dsresource?objectid=151174&type=PDF

Belgium

- In June 2008 the BIPT used it's prerogative to extend the GSM licences of Proximus and Mobistar until 2013. The new expiry date coincides with the end date of the licence of the third operator Base. It is intended that all operators will then get equal assignments of 900 MHz spectrum.
- Source: http://www.bipt.be/GetDocument.aspx?forObjectID=2810&lang=fr

Finland

- In November 2007 Finland became the first country in Europe to enable the concurrent use of 900MHz frequencies for second and third generation (GSM and UMTS) mobile communications
- TeliaSonera Finland Oyj, Elisa Oyj and DNA Verkot Oy will have equal and sufficient resources and contiguous frequency bands for the purpose of carrying out and developing mobile communications operations
- Source: http://www.ficora.fi/en/index/viestintavirasto/lehdistotiedotteet/2007/P_10.html

France

- In March 2006, ARCEP renewed the GSM licences of Orange France and SFR (awarded in March 1991)
- As part of the 900MHz spectrum liberalisation process, ARCEP has tested the French market for a potential new entrant; ARCEP received one new entrant bid, which it deemed non-compliant
- Sources: http://www.arcep.fr/uploads/tx_gspublication/consult-freqc-900-1800-051006.pdf; http://www.arcep.fr/uploads/tx_gspublication/consult-umts-900mhz-mai2007.pdf

Italy

- On 21 May 2008, AGCOM approved the plan for mobile spectrum refarming; from 1 July 2008, MNOs will be able to offer UMTS services on their former GSM spectrum (900/1800 MHz)
- AGCOM assigned 900MHz spectrum to incumbents in the 900MHz band
- AGCOM argues that there doesn't seem to be a positive case for a new entrant
- AGCOM proposed that the refarming process should not have any effect on the duration of the licences of the authorised operators, although following the refarming of the 900MHz and 1800MHz bands, the GSM licenses could be converted to UMTS and extended until they are aligned to the present UMTS licences, in order to have a homogenous deadline
- Source: http://www.agcom.it/provv/d_343_07_CONS/d_343_07_CONS_all_B_eng.pdf

Spain

- In 2002, surplus GSM spectrum was granted to incumbent GSM operators in order to improve the capacity of their networks
- The Ministry is currently consulting on the issue of re-farming in the 900 and 1800MHz bands.

Hong Kong

- In 2002, OFTA allocated the unassigned spectrum in three equal portions of 2×0.8MHz to CSL, Hutchison and SmarTone (each had previously been assigned 2×7.5MHz of spectrum); this spectrum was assigned to all existing MNOs in order to prevent the increasing demand for data threatening network service quality
- Source: http://www.ofta.gov.hk/en/tas/mobile/ta20020301.pdf

Switzerland

- In April 2008, ComCom provisionally extended the GSM licences of Orange, Sunrise and Swisscom Mobile (which expired at the end of May 2008) until 31 December 2013; these provisional licences are restricted for GSM services only
- In March 2007, ComCom had announced its decision to renew the GSM licences of Orange, Sunrise and Swisscom Mobile, additionally allowing the operation of UMTS in 900MHz and 1800MHz; however, challenges in court has resulted in delays in the licensing procedures

The UK

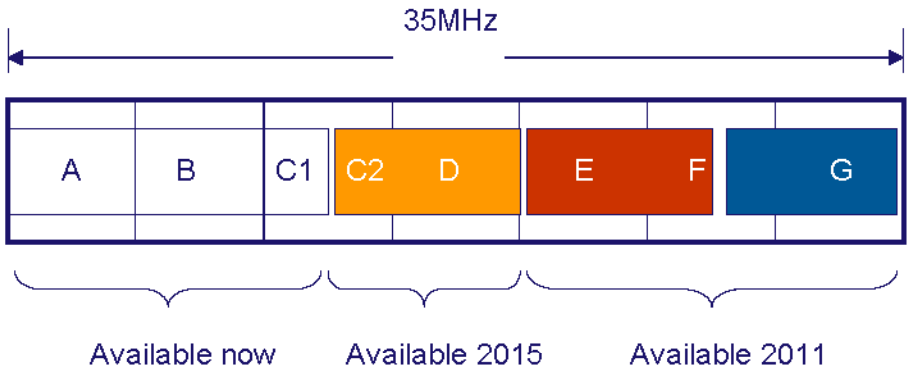
- Ofcom initially proposed to redistribute spectrum holdings, but rejected the possibility of a complete re-auction as it would cause undue disruption
- Ofcom is expected to consult again on the issue of liberalisation of the 900 and 1800MHz bands in the near future

6. Proposed method for assignment of 900MHz spectrum

O2 can propose an alternative process for liberalisation and assignment of spectrum in the 900MHz band. The process proposed will minimise disruption for consumers, protect existing operators and ensure spectrum is available for new entrants if required. It is efficient, and will also enable the introduction of new services.

6.1 Issues to be resolved

There are a number of issues or difficulties that ComReg must seek to resolve in its review of the assignments in the band.



- Ideally, the final assignments in the band should be made of whole blocks of 2×5MHz – this is required for 3G operation
- The current assignments don't match with the final arrangement of 7 blocks of 2×5MHz. In particular blocks C and F are partially covered by different allocations
- The current assignments do not allow for easy aggregation in the event that an existing operator was assigned additional spectrum
- Three different dates cover availability/assignments in different parts of the band
- Security of assignment is not known beyond 2011 for two operators.

O2 proposes that all of these factors should be considered and accommodated or eliminated as appropriate in the re-assignment process. O2 proposes that ComReg should do the following.

- Allocate all of the spectrum in the band at the same time
- Assign the spectrum using a two-stage process in which the quantity of spectrum assigned for each operator is determined first, and then the position within the band

- In the first (principal) stage, reserve spectrum for existing operators in the band (2×7.5MHz)
- Auction spectrum in blocks of 2×2.5MHz
- Impose an initial spectrum cap of 2×10MHz per operator for a limited period only
- Make no reservation of spectrum for new entrants, however the spectrum cap in effect will ensure that at least 2×5MHz is available either for a new entrant to the market, or for a new entrant to the band
- Assign the spectrum on a service and technology neutral basis, subject to meeting the requirements in the Commission Decision on harmonisation of the 900MHz and 1800MHz bands.

In addition, ComReg should do the following.

- Maintain the current spectrum access fees for existing operators for the duration of existing licences, thereafter the market based price as determined at auction could commence
- Allow for some distribution of the payment of fees for new assignments over the early years of the assignment
- Make the new licences of indefinite term, subject only to reasonable notice to quit on spectrum management grounds
- Include some minimum requirement for spectrum utilisation.

A period for re-tuning would be required following the assignment process, however O2 believes this could be agreed among the operators, as it is ultimately in the interest of all concerned. ComReg could facilitate these discussions, or provide a framework to the process.

The above process would satisfy all of the major requirements ComReg has in reassigning spectrum in the band.

- It protects existing operators and consumers against disruption and loss arising from the loss of 900MHz spectrum
- It allows new entrants to obtain spectrum in the band if their use is the most efficient; 2×12.5MHz of free spectrum would be available for auction
- It prevents an existing operator from obtaining all of the unassigned spectrum through the short term spectrum cap
- It allows for aggregation of assignments into contiguous blocks
- It allows for the creation of 7 blocks of 2×5MHz
- It protects existing operators from strategic bidding.

Some aspects of this process are examined in more detail below.

6.2 Reserve spectrum for existing operators

Reservation of 2×7.5MHz for existing operators meets the justified requirement to protect existing operators against loss of spectrum and against strategic bidding. At present there are guard bands made up of unused spectrum between existing assignments. There will be no guard bands in the new assignments as they will be internalised within each operator's own blocks. The reservation of 2×7.5MHz in conjunction with the auction of 2×2.5MHz lots allows the auction to result in a whole number of 2×5MHz blocks if that matches the spectrum requirement of operators.

6.3 Spectrum caps

In general, O2 believes that spectrum caps should only be use in limited circumstance, as they can inhibit the most efficient assignment of and use of spectrum.

In this case, O2 is of the opinion that ComReg can justify a spectrum cap of 2×10MHz for a limited period, in order to ensure the optimum outcome for the 900MHz spectrum auction process. This can easily be reversed at any time by removal of the cap, and it should be removed immediately after the assignment process.

At present, there is scarcity of low frequency spectrum, which would justify a spectrum cap to allow for the most efficient use of the highly demanded spectrum. Nevertheless, there may be potential future developments which would make a spectrum cap of 2×10MHz inappropriate, namely:

- Future mobile technologies may have different requirements for low frequency spectrum. A spectrum cap could inhibit the most efficient assignment of spectrum, which would result in operators unable to invest in the most advanced mobile technologies that would benefit consumers (e.g. LTE)
- Other low frequency spectrum becoming available in the future (i.e. the digital dividend) could result in less constraint on the supply of low frequency spectrum. Again, in this scenario, operators should not be constrained from acquiring more 900MHz spectrum by a spectrum cap that no longer reflects the new market situation.

Therefore, O2 believes that although the current situation justifies placing a 2×10MHz cap on 900MHz spectrum in an up-coming auction, this cap should be temporary and only applicable in this auction process. If demand proves to be less than supply, then the cap should be lifted immediately.

6.4 Auction process

The auction proposed is a two stage combinatorial clock auction (principal stage and assignment stage). The principal stage is a clock auction in which participants bid for five abstract lots, which represent the five 2×2.5MHz lots that are not reserved for O2, Vodafone and Meteor.

In such a clock auction, the price per lot is increased steadily over consecutive rounds, with bidders in each round indicating their demand for lots at that price. The auction continues until the price reaches a level where demand for lots is equal to (or less than) supply (in this instance five lots), at which point 'the clock stops.' All bidders that indicate demand during this final round would be guaranteed to be awarded at least the same number of lots following the assignment stage. O2, Vodafone and Meteor would then be assigned three additional lots, representing the 2×7.5MHz of spectrum that is reserved for them.

The assignment stage is used to determine actual assignments of lots. Successful bidders from the principal stage would be able to place a series of bids on a number of contiguous packages of the 14 lots (five lots won in the assignment stage plus the nine assigned to O2, Vodafone and Meteor). By placing multiple bids, bidders would be able to express their relative preferences for each package. After submission of all bids, a computer algorithm would be used to determine the highest value combination of all package bids, subject to no bidder having more than one package bid accepted, and no lot being assigned more than once. Note that if the final round of the principal stage demand is less than supply, mechanisms can be included in the assignment by which this can be awarded.

Combinatorial clock auctions are proposed for both the upcoming UK and Dutch 2.6GHz auctions. They are attractive as they are relatively easy to implement and simple for participants to understand. It guarantees that all successful participants are assured contiguous spectrum. Finally, it reduces the scope for strategic bidding, as prices are automatically uniformly applied to all bidders in the proxy phase.

This format also has the additional advantage that the principal stage establishes a market price for spectrum in the band. This could be used to determine the price for the spectrum reserved for O2, Vodafone and Meteor. This means that O2, Vodafone and Meteor do not gain a financial advantage over other bidders from having spectrum reserved for them.

The auction proposed is similar in some respects to the one used by ComReg this year to assign spectrum in the 26GHz band. The difference being the use of clock rounds in the principal stage.

O2 currently believe that the above format represents a good option, however, it recommends that ComReg conducts a thorough study to establish the most appropriate format. In particular, ComReg might consider a simultaneous multi round auction (SMRA) if the valuation between lots is expected to be large.

6.5 Auction fees/spectrum fees

Existing operators have periods remaining on their current licences. For O2 and Vodafone that is until mid-2011. For Meteor, it is until mid-2015. Licence fees were accepted by both parties at the licence commencement, and cannot be unilaterally amended by either one. So long as operators continue to operate their services in accordance with their current licences, they are entitled to do so without amendment to the fees. The best way to take account of this remaining licence term for each operator is to allow credit for the remaining term of existing licences against the fees for the reserved spectrum. Account would also need to be taken of the timing of payments, i.e. O2 and Vodafone would not have been expected to pay fees in respect of 7.5MHz/7.2MHz of spectrum until mid-2011, and Meteor until 2015.

Any proposal to allow for mid-term increases of licence fees would introduce an unwelcome degree of uncertainty for operators which would be taken into account in any auction valuation. In practice, O2 is of the view that spectrum values have fallen in recent years, and that a review of the value of existing 1800MHz or 2.1GHz assignments would actually determine that a significant reduction in fees is warranted.

O2 is of the opinion that any auction fee payment should be structured as an initial payment followed by a series of annual payments in the early years of the licence. In the absence of spectrum trading, this incentivises efficient use of spectrum by encouraging the release of any that is unused.

An initial payment that is not excessive, but a sufficient proportion of the total is required in order to ensure the auction outcome favours sustainable investment. A bidder could inflate the cost of spectrum for all bidders based on an unsound business case. They might abandon the market after a short period, leaving other operators to continue to work with the consequences for the remaining term of the licences.

6.6 Licence term

O2 is of the view that new the licence term should be indefinite, subject only to a reasonable period of notice where assignments must be recovered for spectrum management reasons. This option is most consistent with ensuring ongoing investment. It becomes increasingly difficult for operators to compete for and commit to ongoing investment towards the end of a licence term.

This issue has been considered in some detail by Ofcom in its recent consultation paper on the Digital Dividend[5], which states:

[5] http://www.ofcom.org.uk/consult/condocs/clearedaward/condoc.pdf

> "6.37 We consider that there are a number of reasons why licences with an indefinite term are likely to promote optimal use of the radio spectrum and other relevant objectives, including the promotion of competition.
>
> 6.38 In particular, the award of licences with an indefinite duration reduces the need for regulatory intervention to reassign spectrum at the end of the licence term. One disadvantage of fixed term licences is that at the end of the licence term the licence expires and so the rights to use it must be returned to the regulator, unless any other action has been taken. This may result in a period during which the spectrum remains unused, as the regulator must go through a process to reassign those rights. Furthermore, incentives to invest closer to the end of a licence term are significantly reduced given that communications networks generally require continual investment. This lack of investment could result in detriment to consumers and citizens. The alternative of licences with an indefinite duration removes the requirement for return to the regulator, removes the risk of discouraging investment and creates additional opportunities for the market to secure the efficient use of the spectrum, particularly in the presence of spectrum trading.
>
> 6.39 We consider that, as a matter of principle, it is preferable to look to market mechanisms to promote the efficient use of resources rather than regulatory intervention, unless the case for such intervention is clear. To date we have not identified a general need for us to recover spectrum at the end of the initial term in relation to any of our spectrum awards.
>
> 6.40 We consider that there are likely to be a number of other advantages to adopting the general approach proposed above. In particular, reassignment by the regulator typically takes significant time and resource. The spectrum may also lie idle for a period as the regulator prepares for reassignment. While it may be possible to reduce this problem through the use of overlay auctions, the approach of an indefinite term together with spectrum trading seems likely to offer a simpler and less costly way of ensuring the spectrum is used efficiently."

Without prejudice to the above position, O2 is of the view that at minimum, the licence term for new assignments should be 20 years to bring the termination date beyond the expiry of current 2.1GHz assignments. It would not be desirable to have a number of core band licences come due for expiry at the same time, as this would further increase uncertainty towards the end of the term, and could hamper investment. A 20 years term is approximately compatible with two equipment lifecycles today.

7. Response to questions

Q. 1. Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions? Please provide supporting arguments with your answer.

O2 agrees with the proposal to liberalise insofar as existing operators should have the option to introduce 3G or other services on their assignments if they so choose, provided any services introduced are compatible with existing services in the band i.e. those included in the Annex to the EC Decision. This gives existing operators the ability to introduce 3G service in the band, which is the earliest way for consumers outside of existing 2.1GHz coverage to receive mobile broadband.

In time, there may also be other services that are compatible with existing services in the band and which would be beneficial to end users.

ComReg should also allow for spectrum sharing when liberalising licences. This might be required in future for the introduction of LTE or other high bandwidth services.

Q. 2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

O2 agrees with the proposal, for similar reasons as stated in response to Q.1.

Q. 3. Do you agree that a review of the annual licence fees is appropriate at this time to determine whether or not these fees should be adjusted to take into account the increased value associated with liberalised 900 MHz licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

O2 does not agree that a review is appropriate or possible. Licence fees were set at the time of licensing and accepted by both parties. They cannot be unilaterally adjusted by one party now. ComReg has assumed that there is some increased value accorded to the licences, but this would seem incorrect. If an operator continues to operate the service as before, then the value of the spectrum is unchanged.

Q. 4. Do you agree with ComReg's proposal that an auction mechanism is the most appropriate format for granting future 900 MHz spectrum licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Subject to the detailed points in Section 6 above, O2 agrees that an auction would be an appropriate method for allocation of unassigned spectrum.

Q. 5. Do you agree with ComReg's proposal to place a cap of 2 × 10 MHz on the amount of spectrum that any one licensee can hold in this band? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

As stated in section 6.3 above, O2 agrees that a spectrum cap of 2×10MHz is acceptable in this case for a limited period only. In general, spectrum caps can inhibit efficient assignment by limiting operators – regardless of whether they have a demand for more spectrum.

The spectrum cap should be removed immediately after the assignment process is complete. In future, operators may require contiguous assignments of more than 2×10MHz. This might be possible when further spectrum is released, such as the Digital Dividend spectrum.

Q. 6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes, O2 agrees with the proposal, for the same reasons and subject to the same conditions as stated in response to Q.1.

Q. 7. In the absence of spectrum trading, what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.

Please refer to section 6.6 above – O2 believes an indefinite term licence is warranted and appropriate. Without prejudice to this position, the minimum licensing period should be 20 years, approximately 2 equipment life cycles.

We take this opportunity, however, to encourage ComReg to start work, together with the Department of Communications, on the introduction of spectrum trading legislation, which is likely to be needed as part of the implementation of the revised European Regulatory Framework.

Q. 8. Do you agree with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band? Please provide supporting arguments with your answer.

The existence of staggered termination dates causes difficulties for reassignment of the spectrum and limits the options available. This problem needs to be eliminated, and in section 6 above O2 has proposed a method to eliminate this issue now.

Q. 9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences? Please provide supporting arguments with your answer.

This proposal is neither appropriate nor possible. ComReg has imposed MVNO obligations previously and this has done little to attract MVNO operators to the market. The only MVNO in operation was introduced in the absence of regulatory obligations.

As examined above in sections 4 and 5, the current regulatory and legislative framework prevents ComReg from imposing such an obligation as a condition of a spectrum licence.

Q. 10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

Yes, O2 agrees in principle with the proposal, however care must be taken to ensure that any service introduced into the band will not cause interference to existing services. O2 believes only those services which have been listed in the Annex to the EC decision should be permitted to operate in the band.

Q. 11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2×5 MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

It is agreed that the logical unit for division of assignments in the band is 2×5MHz blocks, however this is too coarse of a quantity to be efficient for new assignments. It is more efficient to use a fractional lot size that aggregates up to a full 2×5MHz block. It is suggested that a 2×2.5MHz block size be used.

There are several examples where this block size causes conflict with ComReg's own proposals, including:

- The spectrum cap in conjunction with 5MHz block size would prevent existing operators from bidding for any unassigned spectrum under option A. 5MHz + 7.2MHz would breach the 10MHz maximum
- Block C is impaired under the options proposed if a 5MHz block size is used for assignments – it is partially occupied by Meteor until mid 2015.

Q. 12. Do you agree with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

O2 agrees with the proposal to internalise the guard bands within each operator's assignments, this should lead to more efficient spectrum utilisation. However this does not mean that the need for guard bands will disappear altogether. This is why O2 is proposing that 7.5MHz is reserved for existing operators in the assignment process – at least 7.4MHz is required to give equivalent useable spectrum to that which exists under the current 7.2MHz assignment. A slightly larger assignment may be required where UMTS service operates in a block adjacent to GSM.

This can only work effectively if operators give protection to their neighbours.

Q. 13. Do you support Option A? Please provide supporting arguments with your answer.

O2 does not agree with Option A. It is flawed and fails to meet ComReg's obligations for spectrum management in several respects:

- It prevents existing operators from bidding for blocks A, or B, by virtue of the spectrum cap – this leaves only C1 for which three existing operators can bid in the first auction.
- It provides no protection for existing operational networks that provide services essential for day-to-day life in Ireland today. As such, it fails to meet ComReg's objectives for spectrum management
- It creates uncertainty that would impede investment
- Even in the absence of the spectrum cap, this option would limit the supply of spectrum available during each auction creating an inefficient outcome
- It risks bidders unintentionally winning non-contiguous spectrum. This would be an inefficient outcome.

Q. 14. Do you support Option B? Please provide supporting arguments with your answer.

O2 does not support Option B. Again it fails to meet ComReg's objectives for management of the spectrum:

- It provides no protection for existing operational networks that provide services essential for day-to-day life in Ireland today
- It expects existing operators to bid for access to spectrum, giving no credit for the fact that they may already hold a licence to operate in that spectrum
- It places a bias towards operators bidding for maximum overlap with existing spectrum assignments, which causes aggregation problems
- Blocks C and D are impaired by Meteor's assignment which will last until mid-2015 – six years after the auction. This is between 40% and 60% of the licence duration proposed by ComReg in part 7.3.2 of the consultation document.

Q. 15. Do you support Option C? Please provide supporting arguments with your answer.

No, this option is similar to Option B, however with one or two blocks reserved for new entrants. This option carries the same disadvantages as Option B, with a number of more serious flaws:

- ComReg proposes to reserve spectrum for "new entrants to the band" as opposed to new entrants to the market.
- ComReg has produced no analysis to justify reservation of spectrum for a "new entrant to the band", and so fails to meet the requirement in legislation that such assignment be objectively justified. Equally, no analysis has been undertaken to assess whether the resulting impact on existing operators is proportionate
- The evidence in support of reserving spectrum for a new entrant to the market significantly overestimates the benefits. O2 has asked Analysys Mason to examine this issue and has found that in practice, the net loss if O2 were to lose its 900MHz spectrum is greater than the benefit of a new entrant to the market.
- No analysis has been carried out by ComReg to show whether the benefits of a new market entrant could be gained by the entrant using spectrum other than 900MHz
- Reserving spectrum for a new entrant would expose existing operators to negative bidding – the new entrant could bid up the price for existing operators way beyond the market price, secure in the knowledge that existing operators "must" secure the spectrum and that there is no cost to itself as its spectrum is reserved. This would be an unfair auction process. The only way to prevent this would be to bar the new entrant from bidding for unreserved spectrum
- It is not necessary to reserve spectrum for new entrants. If they can generate greater benefits from spectrum than an existing operator, then this should be reflected in their valuation. This

would result in them acquiring spectrum at auction. This would be an efficient outcome.

Q. 16. If you agree with Option C, do you have views on the number of blocks that should be potentially reserved for new entrants? Please provide supporting arguments with your answer.

See response to Q.15 above.

Q. 17. Do you believe there are other viable options that ComReg should consider? If so please explain these options in detail with supportive arguments.

See O2's alternative proposal in section 6 above.

Q. 18. Do you agree with ComReg's assessment that there is insufficient demand for 1800 MHz spectrum assignments to warrant holding a competitive award process at this time? Please provide supporting argument your answer.

Whilst O2 believes that the issues surrounding the 900MHz band are sufficiently complex by themselves to justify a focussed award process on this band alone, we support ComReg's proposal to liberalise the existing 1800MHz licences at the same time as in the 900MHz band (see Q1 & Q2). This leaves the issue of the unassigned spectrum to address.

In the absence of any demand indicators at this time, it is appropriate for ComReg not to propose a competitive award process at this time. It is also likely that potential licensees of the unassigned spectrum are waiting for several associated issues to become clearer before they indicate firm interest in this spectrum:

- Future requirements for use of the existing spectrum, which may be affected by the decisions ComReg will be taking regarding the 900MHz band
- Real signs of new technological developments (vendors appear to have assigned priority to 3G in the 900MHz and 2600MHz bands, and may also prioritise effort on the Digital Dividend spectrum once European frequency arrangements become clear – it is not yet clear where the 1800MHz band will figure in the prioritisation of future LTE developments)
- Decisions regarding the future use of the 2600MHz band; ComReg is proposing to hold further workshops and consultations over the next 12 to 18 months and it may be appropriate to include consideration of the unassigned spectrum at 1800MHz at that time
- Decisions regarding the Digital Dividend. ComReg has said that it will develop its strategy as DTT rolls out, and will discuss the issue further at its Annual Conference. It may be appropriate to include

consideration of the unassigned spectrum at 1800MHz at the time that decisions regarding the Digital Dividend are made.

Q. 19. Do you agree that the holding of a spectrum award process for 1800 MHz spectrum circa 2013 would be appropriate? Please provide supporting arguments with your answer.

No, O2 does not agree that it is correct to conclude that the appropriate timing for an award of the unassigned spectrum at 1800MHz is around 2013. A number of related issues may determine the extent of demand for this band, including ComReg's decision on the 2.6GHz band, the Digital Dividend spectrum, and the availability of LTE equipment.

The availability of 1800MHz always provides an option for market entry without the necessity for disruption to users of the 900MHz band.

Q. 20. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2×5MHz for future 1800 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

For similar reasons to those previously expressed, it is likely that the most appropriate block size required in the future will be 2×5MHz. However, O2 believes that it would be appropriate prior to the award to normalise the current licences (which are 2×14.4MHz with guard channels) into 2×15MHz blocks (with internalised guard bands). This could be implemented at the same time as the existing 900MHz licences are normalised to 2×7.5MHz blocks, making the resulting assigned sub-band from 1735-1780/1830-1875MHz.

Annex

Analysys Mason does not believe that the benefits of a new entrant gaining spectrum are greater than O2, Vodafone and Meteor gaining these blocks, for the following reasons:

- it is not clear that the business case for new entry is viable, and that a new entrant would bring sustainable benefits
- we believe ComReg has overstated the welfare benefits of new entry
- we estimate that the welfare benefit is larger for existing operators than for a new entrant

Each of these are discussed in more detail below.

It is not clear that the business case for new entry is viable

There have been limited instances in recent years of new entry into Western European mobile markets (examples are Teletopia and Nordisk Mobiltelefon in Norway, RadioMovel in Portugal, and Yoigo in Spain). Indeed, there have been several more instances of operators exiting markets (such as Orange and Telfort in the Netherlands, Quam and Mobilcom in Germany, Orange in Denmark, tele.ring in Austria, Q-Telecom in Greece, and Blu in Italy). This suggests that it is difficult to develop a positive business case for entry into Western European mobile markets. Hence, it is not clear that a new entrant would bring sustainable benefits.

This is a similar view to that taken by the French and Italian regulators in their consultations regarding GSM spectrum refarming:

- AGCOM concluded that a positive business case for a new entrant was unlikely in its consultation on "900, 1800 and 2100MHz frequency bands usage by radio – mobile systems"
- When the French GSM operators applied to use UMTS in the 900MHz band, ARCEP launched a consultation to gauge interest in entry into the French mobile market. Ultimately, no credible new entrant was found.

ComReg may have overstated the welfare benefits of new entry

Analysys Mason believes that ComReg may have overstated the benefit of a new entrant gaining 900MHz spectrum. In the annex of its consultation, ComReg provided an analysis suggesting that the total welfare gain from new entry in the market (increasing the number of operators in the market from four to five) is around EUR206 million. However, we believe that by assuming

constant ARPU and a constant demand curve over time, ComReg overstates this benefit[a]. ARPUs in Ireland have been falling over the last few years[b], but still remain well above many other Western European markets.[c] Therefore, it is reasonable to expected them to continue falling. It is also usual in such economic modelling to assume that the 'choke price (the minimum price that would result in zero quantity being demanded) falls over time (as illustrated below). This is because it is reasonable to assume that the price for substitute technologies and services will fall over time, resulting in the maximum price that can be charged for mobile services to also fall over time.

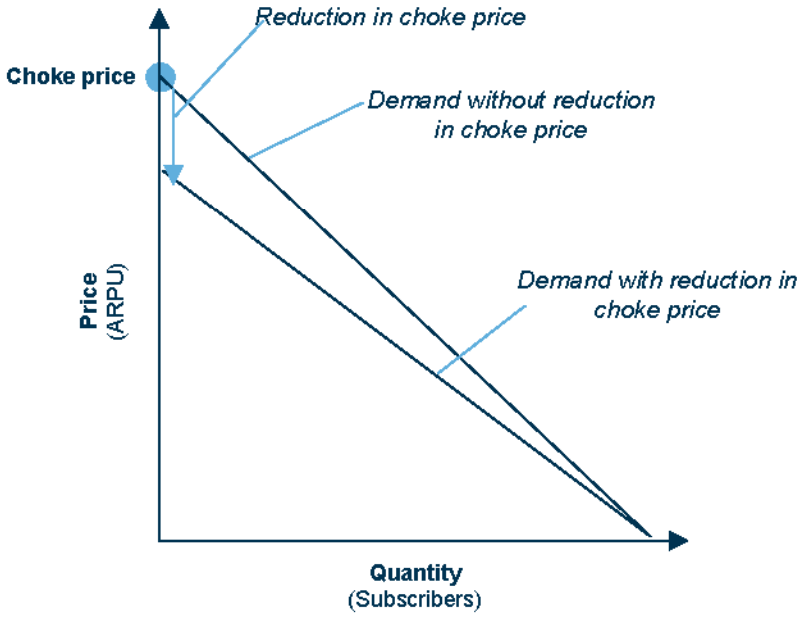


Figure 1: Illustration of impact of a reduction in the choke price

Based on ComReg's description in Annex F of its consultation we have replicated the model. We are unable to exactly replicate ComReg's results, but our results are close (EUR195 million total welfare benefit from the number of operators in the market increasing from four to five, compared to EUR206 million quoted by ComReg). We have then chosen more realistic assumptions for the future trend in ARPUs and the choke price (-5% per annum for each). The resulting total welfare benefit of market entry (from four to five operators) is EUR130 million, over 35% below ComReg's estimate. This is further supported by analysis conducted by Ofcom in their recent consultation on the "Application of spectrum liberalisation and trading in the mobile sector"[d],

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a Furthermore, ComReg is not clear in its documentation whether its model is built in real or nominal terms. Given it has chosen a discount rate as low as 5%, we assume that the model is in real terms. ComReg's assumption that ARPUs will remain flat in the future appear even more unreasonable in real terms.

b Mobile services ARPU (nominal) has declined from EUR47.40 in 2004 to EUR44.10 in 2007 (source: Analysys Mason)

c In 2007, mobile services ARPU in Ireland was 54% higher than a Western European average (source: Analysys Mason)

d http://www.ofcom.org.uk/consult/condocs/liberalisation/liberalisation.pdf

which states that the welfare loss to the UK of moving from five to four operators would be GBP1.1 billion. Scaling this figure to the Irish market, this equates to around EUR100 million, around half the value suggested by ComReg.

The benefit is larger for existing operators to gain blocks A and B, rather than a new entrant

If new entrants were to acquire two blocks, this would mean that at least one of the existing operators with 900MHz spectrum (O2, Vodafone or Meteor) would not be able to add to their existing 900MHz spectrum holdings. Analysys Mason believes that this would be an inefficient auction outcome as we estimate that the benefit from one of the existing operators gaining these two blocks is likely to be higher than that of a new entrant.

O2's existing 900MHz spectrum (2×7.2MHz) is fully utilised to provide GSM services; we assume that this is also the case for both Vodafone and Meteor. Gaining access to an additional 2×2.5MHz block in 2009 would enable these operators to rollout 3G services in rural areas at much lower cost than can be achieved with other 3G spectrum holdings (i.e. 2.1GHz).

- Gaining additional spectrum would allow existing operators to provide high quality indoor 3G coverage in both urban and rural areas at much lower cost than can be achieved with 2.1GHz spectrum. Analysys Mason estimates that there would be an additional NPV cost of approximately [ ]. This cost is significantly higher than the estimated welfare benefits from new entry.

- The incremental cost of providing this 3G coverage using 2.1GHz could mean that these operators are unable to reduce prices as quickly in the future. [ ].

Therefore, Analysys Mason believes that it would be inappropriate for ComReg to reserve lots for a new entrant. This is likely to result in an inefficient auction outcome, whereby new entrants gain two blocks of spectrum, when one of the existing operators with 900MHz spectrum may have a superior business case and could generate a greater total welfare gain.

It should finally be noted that, although it seems unlikely that there is a viable business case for new entry in Ireland, should such a case exist, the new entrant will still have the opportunity to gain spectrum by outbidding existing operators in the auction.

8 UPC Ireland

UPC Ireland response to ComReg consultation on the liberalisation of the 900 and 1800 Mhz spectrum bands (ComReg Document 08/57)

Introduction

1. UPC Ireland welcomes the opportunity to respond to the ComReg consultation on the liberalisation of the 900 and 1800 Mhz spectrum bands.

2. UPC Ireland's interest in the future management and potential liberalisation of spectrum bands stems from the fact we currently own, manage and offer broadcast services over our MMDS network which operates in the 2.5Ghz band.

3. In order to offer true mobility with national coverage and to compete with established players in the mobile market on both data and voice then an allocation of 900MHz is a pre-requisite for an economic national mobility business case. 900 MHz spectrum provides the optimum economics for a new entrant to successfully deploy 3G and 4G technology as long as sufficient spectrum is made available and minimal upfront costs to obtain the spectrum are possible.

4. Since taking ownership of the Chorus and NTL cable assets, UPC Ireland has demonstrated a willingness to invest in infrastructure and continues to make this investment in the cable plant by taking it to its full triple play potential.

5. UPC Ireland has a keen interest in ComReg's current proposals and would state for the record, the interest of non- licensees in the proposed liberalisation of both spectrum bands.

6. Since the publication of the ComReg document 08/57, the Department of Communications Energy and Natural Resources (DCENR) has published a separate consultative document on future management of spectrum in Ireland. The DCENR document espouses similar principles to the ComReg paper, namely the need to promote efficient, flexible use of spectrum that would be allocated on a service and technology neutral basis. It is understandable that both parties have a vested interest in the wider debate on future management of this valuable resource, however it will be important that both entities are coordinated in the final outcome of their respective consultations. At a minimum, findings from the DCENR consultation should be factored into the ComReg consultation on 08/57 as well as future consultations on other spectrum bands.

7. Finally, UPC Ireland would strongly argue that the liberalisation of these two bands (or indeed any other spectrum bands) should not be reviewed in isolation. Earlier this year, ComReg issued a spectrum strategy document whereby it outlined in general terms how it intends to approach spectrum management – as a whole – until 2010. While UPC Ireland appreciates ComReg may have to

consult on the liberalisation of spectrum on a band-by-band basis, it is important ComReg take a holistic approach when considering the future management of spectrum more generally. This includes, the 900 MHz, 1800 MHz along with the 2100 MHz and 2500 MHz UMTS bands. If the final outcome of this consultation results in the renewal of licenses (whether by auction or otherwise) which is desireable from both minimising disruption and ensuring operators can rely on a longer payback period when investing in new services, then we are firmly of the belief that this same approach needs to be adopted in all future licence renewals.

Response to specific questions

UPC Ireland has responded to specific questions outlined in the ComReg consultation. Where no supporting arguments have been provided the answer should be read as supporting arguments as provided in document 08/57.

Q. 1. Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions? Please provide supporting arguments with your answer.

Yes. UPC Ireland would also support holding an award for the 1800 spectrum band prior to 2013 and preferably in conjunction with the award in the 900 band.

Q. 2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes.

Q. 3. Do you agree that a review of the annual licence fees is appropriate at this time to determine whether or not these fees should be adjusted to take into account the increased value associated with liberalised 900 MHz licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

A review should be conducted which balances both the increased revenue potential for these services but also takes into account the fact that going from 2G to 3G may not reduce costs. 2G (GSM) handset costs are the most economical at this point. At some future date it is expected that 3G handset costs will match 2G but sufficient worldwide volumes are required. 3G does have a capacity and spectral efficiency advantage over 2G and therefore network efficiencies are possible. As an illustration, the 4th operator, Hutchinson (3) operates a 3G network but is unable to gain substantial advantages because of its higher handset costs. An increase in licence fees is not necessarily the answer to a liberalised licence policy.

Q. 4. Do you agree with ComReg's proposal that an auction mechanism is the most appropriate format for granting future 900 MHz spectrum licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

We believe that in granting future spectrum licences in the 900MHz band or indeed any band needs to be cognescent of a number of factors including, the current and future use of this band, providing the foundation for increased competition & innovation, the liberalisation of future spectrum bands and deriving a fair economic return for the spectrum.

To this extent we believe that the existing operators should have licences renewed allowing for the orderly migration /upgrade of GSM services but these to be renewed subject to a licence fee review (price to be set).

Awarding future spectrum beyond this in the 900Mhz band should be focused on facilitating innovation and competition not only in mobile services but across all communication services. As such it would not be appropriate to apply auctions to any frequency block that may be reserved for new entrants.

Existing licence holders originally acquired their licences out of auction and have had a number of years to channel their financial investments into their network build and roll out of their customer services.

New entrants will have to compete with the incumbent mobile operators that, in addition to acquiring their original licences out of auction, have the added benefit of first mover advantage as well as having presumably recovered costs of the initial network build. While there is no denying existing operators may incur additional expense in modifying their networks to offer new services, they will have financially gained from having had access to this very valuable spectrum for a number of years as well as having the additional advantage of already having an established customer base.

An alternative fee structure could be considered for new entrants such as a beauty contest (without fees) based upon their ability to offer real alternative competition to the current status quo coupled with the usual requirements on population coverage etc.

If ComReg wishes to foster new competition and drive innovation across all operations they should also seek to regulate economic site access and economic roaming charges (outside their built-out areas) for new mobile entrants and make this a condition of all licence renewals and grants.

Q. 5. Do you agree with ComReg's proposal to place a cap of 2 × 10 MHz on the amount of spectrum that any one licensee can hold in this band? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

The 2X10 cap maybe too high if ComReg wishes to promote new service competition since should all existing licence holders agree to renew their licences then this leaves

just 2X 12.8Mhz of new spectrum. If a true level playing field is to be created then access to 2x 10 Mhz will be a minimum requirement for a new entrant deploying 3G and 4G technologies.

Current licence holders all have additional spectrum at 1800 MHz and some at 2100 MHz so they will not disadvantaged by this allocation. Existing operators also already have a dense cell site network that does not necessitate them to have to operate at 900 MHz.

Conversely, a new entrant must obtain 900 MHz to enable a positive business case that is range driven. Likewise the new entrant needs sufficient capacity in the 900 MHz band to offer viable broadband services. 4G technologies will require a minimum of 2 x 10 MHz and preferably more in this or other bands.

Q. 6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.
Yes

Q. 7. In the absence of spectrum trading, what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.

Given that the incumbent operators will have less fixed upfront cost to recoup, we would suggest that the new entrant licence would be for 15 years while the renewed licences would be for 10 years

Q. 8. Do you agree with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band? Please provide supporting arguments with your answer.
Yes, subject to the answer in Q7 .

Q. 9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences? Please provide supporting arguments with your answer.

Yes.

As a commercial entity, UPC Ireland would have a clear preference for commercial negotiations to be the basis for any business arrangements between two parties.

ComReg correctly states that it provides for MVNO access provisions in existing licences however the fact remains that there is only one MVNO operator in the State.

This is because current licence provisions are too vague and if ComReg is to ensure the emergence of any MVNO under the new and renewed licences it will have to adopt more prescriptive language in the event there is failure to reach agreement on a commercial basis.

ComReg could consider minimum commercial requirements a network operator would have to meet in response to requests from an alternative operator (e.g. pricing to be dependent on the amount of data or voice transmitted) which would allow for a reasonable return on margin by the MVNO.

MVNOs can also drive innovation into the market place but this is dependent on them having the ability to get reasonable wholesale arrangements for tower and radio spectrum access so they can differentiate their own services from both a product and price perspective. Without this the MVNO parties become just resellers of the MVNO's products and offer little more than another channel to market for existing products rather than fostering competition.

Q. 10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

Yes.

Q. 11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

No, it is critical for the new entrant to have a 2 x 10 MHz spectrum block. Existing operators are very keen to have a new entrant be restricted to a 2 x 5 MHz block because that will ensure they will be unsuccessful as a competitor. See answer to Q5

Q. 12. Do you agree with ComReg's frequency co-ordination and interference mitigation proposal in the 900 MHz bands in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes

Q. 13. Do you support Option A? Please provide supporting arguments with your answer.

No

Q. 14. Do you support Option B? Please provide supporting arguments with your answer.

No

Q. 15. Do you support Option C? Please provide supporting arguments with your answer.

Yes

UPC Ireland supports the arguments made by ComReg in favour of Option C with the exception that new entrants must get a minimum of a 2 x 10 MHz block even if it is at the expense of existing operators 900MHz blocks being smaller.

Q. 16. If you agree with Option C, do you have views on the number of blocks that should be potentially reserved for new entrants? Please provide supporting arguments with your answer.

It will be difficult for the market to support two new mobile entrants (as witnessed by consolidation in other European markets) and as such we would argue that the full new entrant reservation should go to one new player who can clearly demonstrate that they can enter the market and offer real infrastructure competition to the incumbent wired and wireless operators.

Q. 17. Do you believe there are other viable options that ComReg should consider? If so please explain these options in detail with supportive arguments.

We have no particular comment on this section.

Q. 18. Do you agree with ComReg's assessment that there is insufficient demand for 1800 MHz spectrum assignments to warrant holding a competitive award process at this time? Please provide supporting argument your answer.

No. Please see our comments in points 2- 6 in the 'Introduction' section.

Q. 19. Do you agree that the holding of a spectrum award process for 1800 MHz spectrum circa 2013 would be appropriate? Please provide supporting arguments with your answer.

UPC Ireland would have a preference for holding the award process prior to 2013 and in tangent with the award on the 900 Mhz band.

Q. 20. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 x 5 MHz for future 1800 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

No. The principle as discussed in Q5 should also apply here if ComReg wish to offer a new entrant the ability to compete on a level playing field with the existing mobile operators.

9 Vodafone Ireland

Vodafone Response to the ComReg Consultation on Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands

Executive Summary

Vodafone welcomes the opportunity to respond to ComReg's consultation paper on the key issues of liberalisation of use of the 900 MHz and 1800 MHz spectrum and the future licensing arrangements for these bands.

We support ComReg's proposals to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands following entry into force of the EC Decision. The proposed introduction of a service and technology neutral approach to the spectrum in these bands, subject to harmonisation and interference concerns being addressed, offers the potential to deliver enormous benefits to Irish consumers and society. The liberalisation of spectrum rights of use in these bands is a necessary condition for the deployment of innovative and spectrally efficient UMTS technology which would facilitate the economical provision of advanced mobile broadband services with much greater geographic availability than at present.

Whilst Vodafone favours ComReg's proposals to liberalise spectrum rights of use in the 900 MHz and 1800 MHz bands consistent with the principles of service and technology neutrality, we are gravely concerned by the other proposals for future licensing of spectrum in these bands as set out in the consultation paper. In particular:

- Vodafone is alarmed by the absence of a proposal for the extension of the existing 900 MHz licences until the end date of operator's 3G licences in the 2.1 GHz band. The omission of such a proposal is in Vodafone's view contrary to the undertaking given by ComReg in the 3G Licence Tender Information Memorandum where it was stated that retention of the existing 900 MHz and 1800 MHz spectrum assignments would be on a demonstrable need basis until the end date of the 3G licences.

- The proposals to grant new licences for all spectrum in the 900 MHz auction using an auction are neither objectively justified nor proportionate and will cause enormous regulatory uncertainty that will have far-reaching adverse effects for competition and innovation in the market.

- There can be no certainty about the outcome of an auction process. In the event that one or more of the existing 900 MHz licensees were unsuccessful in a spectrum auction there would be serious risks of disruption to their commercial operations and the provision of communications services to their customers would be compromised.

- The three specific licensing proposals set out in the consultation document are deeply flawed and incomplete. The licensing proposals do not ensure the efficient allocation and use of the spectrum and omit key information on the precise auction format to be used that prevents stakeholders from responding comprehensively.

ComReg's proposals for the future licensing of spectrum in the 900 MHz band are therefore contrary to the achievement of ComReg's regulatory objectives as set out in the Communications Regulation Act 2002.

Vodafone considers that ComReg has not carried out the necessary detailed assessment of the likely impact of its proposals on operators and end users and has failed to consider all the available

options to achieve its objectives. Vodafone considers in particular that the failure of ComReg to give any explicit consideration to the option of renewal of existing licences in the consultation paper is a critical flaw in its approach and that this, by itself, requires that ComReg's assessment of spectrum licensing in the 900 MHz band must be completely revised.

The impact assessment contained in the consultation document is not only insufficient, but systematically underestimates the risks and costs of ComReg's spectrum licensing proposals. ComReg's assessment that the likelihood and impact of disruption would be limited in the event that one or more existing licensees were to be unsuccessful in a 900 MHz auction is fundamentally wrong as:

- The access of existing 900 MHz licensees to other spectrum (in the 1800 MHz and 2.1 GHz bands) is irrelevant to limiting disruption from any loss of 900 MHz spectrum as a result of being unsuccessful in an auction as it would be prohibitively expensive and practically impossible for existing licensees to actually provide even the same level of service as currently using only this alternative spectrum.

- Regardless of the strong commercial incentives for existing 900 MHz licensees to ensure that consumers were not negatively affected if they did not gain new 900 MHz licences, they would likely be unable to find a solution that allowed continuing unaffected service provision to consumers.

- It is highly uncertain that an existing 900 MHz licensee that would be unsuccessful in a 900 MHz auction would be able to negotiate an interim MVNO agreement with one of the other licensees that had been a successful bidder. Vodafone does not believe that there is a legal basis on which ComReg can propose to impose MVNO access conditions in licences in an auction context without a finding of SMP following market analysis under the European Regulatory Framework. Vodafone considers that this proposal falls outside the Authorisation Directive and could not be legally implemented by ComReg.

Vodafone considers that as the negative impacts of an existing licensee being unsuccessful in a proposed 900 MHz auction are not effectively limited for the reasons claimed by ComReg in the consultation document, it is not tenable for ComReg to propose an auction approach for the entire 900 MHz spectrum band that would involve the risk of auction outcomes occurring that would impose substantial costs and disruption for existing operators and their customers.

As ComReg has not carried out the necessary detailed impact assessment or cost benefit analysis of its proposed licensing options in the consultation document, Vodafone has conducted a preliminary high level assessment, in the response to question 4, of the likely costs that would be incurred if an existing licensee were to be unsuccessful in a 900 MHz auction and had to rely on alternative spectrum to continue to provide services to consumers. This analysis demonstrates that the costs of such proposals outweigh any conceivable benefits from ComReg's proposed spectrum licensing options and that these proposals should therefore be withdrawn.

Vodafone believes that there are other viable options for the allocation of spectrum in the 900 MHz band that ensure the efficient management and use of the radio spectrum, promote competition, and promote the interests of end users, while avoiding the significant risk of adverse auction outcomes and the associated potentially substantial costs and disruption arising from ComReg's current proposed spectrum licensing approaches. Vodafone believes that the optimal approach to the allocation of spectrum, as set out in detail in the response to question 17 is:

- Extend the term of the spectrum licences held by the existing licensees until at least the expiry date of the current 2100 MHz licences in 2021.

- Subject to agreement from all the existing 900 MHz licensees, amend the terms of the existing licences to increase the spectrum holdings of each existing licensee from 7.2 MHz to 10 MHz and to alter the frequencies covered under each licence.

- In the context of the 2 X 10 MHz per licensee spectrum cap currently proposed by ComReg, assign a single 2 X 5 MHz spectrum block in an auction in which existing licensees would not participate.

Vodafone believes that this alternative spectrum licensing option is superior to those proposed by ComReg when measured against the factors set out by ComReg in section 8.2 of the consultation document, and also against other criteria. In particular:

- The extension of the duration of existing licences without an auction would increase regulatory certainty, enabling existing operators to make efficient long term investments in mobile infrastructure and innovation.

- The serious risks of disruption and the substantial costs for the operators and end users that would arise from ComReg's proposals if one or more of the existing licensees were unsuccessful in a 900 MHz auction would be avoided.

- The spectrum would be used efficiently and the existing licensees would have the minimum amount of spectrum necessary to deploy UMTS technology in the 900 MHz band while maintaining existing services to GSM customers.

- A single 2 X 5 MHz block from the currently unallocated spectrum in the band could be assigned to an operator other than the existing licensees, consistent with the regulatory objective of promoting competition.

ComReg should therefore revisit its analysis by taking account of the alternative 900 MHz spectrum licensing option proposed by Vodafone and performing a comprehensive cost benefit analysis, as is warranted by a regulatory decision that will have a major long term impact on the nature of competition and innovation in the mobile market. Vodafone contends that an objective assessment that takes account of all relevant factors can only conclude that the renewal and appropriate amendment of the licences of existing 900 MHz licensees is the optimal approach to fulfil ComReg's regulatory objectives as set out in the consultation document.

ComReg may consider that there is a legal obligation to auction the spectrum currently being used by Vodafone, O2, and Meteor on the expiry of their respective licences. Vodafone does not believe that this is the case. As set out in detail in the response to question 4, spectrum provisions in Irish law reflect the EU framework and there is clearly no requirement that licences be auctioned at the end of their term. Article 14 of the Authorisation Directive states only that any amendment to the terms of a licence must be objectively justified and proportionate and that interested parties should be given a reasonable opportunity to express their views on such amendments (a minimum four

weeks for comments). There is no requirement that any amendment of the licence, whether of the duration or other terms, must always result in an auction.

The absence of any legal requirement to auction 900 MHz spectrum held by existing licensees is further demonstrated by the actions of authorities in other EU member states. It is notable that no EU member state to date has considered it appropriate or necessary to auction existing 900 MHz licences upon the expiry of their term. ComReg's current proposals for the 900 MHz band are therefore clearly without precedent in a European context.

Vodafone contends, based on the provisions of the EU Regulatory Framework and the decisions taken on licence renewal in other EU countries, that there is no legal requirement for ComReg to auction the 900 MHz licences held by Vodafone, O2 and Meteor as they approach the expiry of their term. It is only necessary that an alternative decision by ComReg to renew the 900 MHz licences of the existing operators without an auction is objectively justified, transparent, and proportionate. Vodafone considers that the rationale for extending the duration of existing licences held by the operators in terms of the achievement of ComReg's regulatory objectives is overwhelming, and provided that all stakeholders are adequately consulted, a decision to adopt this approach for the 900 MHz band can be implemented.

Vodafone's position in relation to the proposals contained in ComReg's consultation paper are set out fully in response to the consultation questions below.

Response to Consultation Questions

Q.1. Do you agree with ComReg's proposal to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands as soon as practicable after the EC Decision enters into force and subject to a number of conditions? Please provide supporting arguments with your answer.

Yes. Vodafone welcomes ComReg's proposals to liberalise the existing GSM licences in the 900 MHz and 1800 MHz bands after the EC Decision enters into force. Vodafone agrees with the description of the potential benefits of allowing the deployment of UMTS technology in the 900 MHz band as set out by ComReg in section 5.3 of the consultation document.

As outlined in our response to ComReg's consultation document on ComReg's Strategy for Managing the Radio Spectrum, UMTS 900 refarming by the existing licensees has the potential to offer enormous benefits by allowing mobile operators to respond efficiently and flexibly to the changing needs of customers. Demand from customers for higher data rate services such as web browsing and content downloads is growing rapidly and will continue to do so for the foreseeable future. This is reflected in the recent dramatic growth in the number of mobile broadband subscribers as reported in ComReg's Quarterly Key Data report for the second quarter of 2008. The report showed that mobile broadband subscriptions were the fastest growing mobile delivery platform and that mobile broadband subscribers now account for 222,330 of the total of 1,054,920 subscriptions on all broadband platforms, or 21% of the market. This rapid growth clearly underlines the pressing need to free up part of the GSM spectrum for use for UMTS services without a disruption in the quality of service for existing GSM customers.

Refarming will allow Vodafone and other MNOs to reuse to a considerable extent our existing base station sites. This will reduce the requirement for additional sites to meet growing demand for the new 3G services in areas of existing coverage owing to the greater efficiency with which spectrum in the GSM bands can be used. There will also be a resulting greatly reduced requirement to build out the network, particularly in less populated areas, making it economically feasible to provide coverage to a larger percentage of the population and national territory than would otherwise be possible. The implementation of refarming could thereby contribute significantly toward addressing Digital Divide issues, increase value and choice for consumers, and accelerate the adoption of 3G services by the market.

While Vodafone welcomes the proposals to liberalise the 900 MHz and 1800 MHz bands in Ireland following the entry into force of the EC Decision, we are gravely concerned that other aspects of ComReg's proposals - particularly in relation to the future licensing of spectrum in the 900 MHz band, pose considerable risks for the ability of one or more of the existing licensees to implement refarming while simultaneously maintaining seamless provision of GSM services to our customers. The current spectrum licensing proposals may prevent the full benefits that could arise from the ability to deploy UMTS in the 900 MHz band from being realised. This would be contrary to ComReg's statutory regulatory objectives including, ensuring the effective management and use of spectrum, the promotion of the interests of end users, and the promotion of competition through encouraging efficient infrastructure investment.

Q2. Do you agree with ComReg's proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Yes. Vodafone agrees with the proposal to implement a service neutral licensing regime for existing spectrum assignments in the 900 MHz and 1800 MHz bands. Liberalisation of spectrum rights of use in these bands is important for maximising the economic and social benefits for end users from use of the valuable spectrum resource.

Q3. Do you agree that a review of the annual licence fees is appropriate at this time to determine whether or not these fees should be adjusted to take into account the increased value associated with liberalised 900 MHz licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Vodafone agrees that a review of the annual licence fees may be appropriate at the time that the EC Liberalisation Decision is implemented. The liberalisation of the 900 MHz spectrum is a relevant factor in terms of the market value of the spectrum and the level of spectrum fees. However the proposed liberalisation of spectrum usage rights is only one of the factors germane to the assessment of the appropriate level of the annual licence fees and it is currently unclear to what extent, if any, the current fees should be adjusted until an assessment that considers all relevant factors is conducted.

A review of the annual fees for the 900 MHz spectrum licences must consider the broader competitive and macroeconomic environment in which licensees will be operating going forward. Vodafone considers that these factors are of comparable relevance in a review of the annual fees as the liberalisation of spectrum use. The intense competitive pressures in a maturing mobile market, as indicated in ComReg's most recent quarterly report by generally stagnant industry revenues, falling ARPUs and declining average revenue per minute, is a factor likely to limit operator profitability and therefore the market value of the spectrum. The deterioration of the macroeconomic environment in Ireland and internationally over the last year, which appears likely to be sustained in the medium term, is also likely to restrict the growth of demand for communications services relative to the situation if the buoyant economic conditions of the recent past had been maintained. Both of these factors, in Vodafone's view, at a minimum limit the extent of any upward adjustment in the annual licence fees that may follow from a review.

ComReg recognises, in section 6.3.2 of the consultation document, that current licensees may not be able to extensively benefit from liberalisation in the short term as they will need to continue operating 2G technology in order to meet their ongoing licence obligations. Vodafone can confirm that it will not be possible for us to deploy UMTS technology using the 900 MHz spectrum with our current 2 X 7.2 MHz allocation. At a minimum, therefore, annual licence fees adjusted following a review could only be introduced once existing operators were able to obtain the absolute minimum amount of spectrum necessary before UMTS 900 refarming could become possible (2 X 10 MHz). As set out in the response to question 4, however, ComReg's proposals to auction new licences for all spectrum in the 900 MHz band do not provide any certainty regarding the ability of existing licensees to obtain a 2 X 10 MHz allocation of spectrum. If one or more of the existing licensees were to be left, for example, with only a single 2 X 5 MHz block following a licence competition then

the appropriateness of imposing annual licence fees determined on the basis of the potential cost savings from the deployment of technologies other than GSM in the band would have to be seriously questioned.

It must also be considered that the benefits from spectrum liberalisation are likely to emerge only gradually over the medium term. Vodafone contends that it would therefore be appropriate that any revised annual licence fees arising from a review would be phased in gradually over a number of years.

ComReg refers in the consultation paper to the significant cost savings that licensees could obtain from the liberalisation of the spectrum. Vodafone must emphasise that the correct purpose of annual licence fees is to ensure that licensees take account of the opportunity costs of inefficient spectrum use, not to appropriate the full value of any cost savings that could be realised from beneficial spectrum policy changes such as the proposed liberalisation of the 900 MHz spectrum band. Given the competitive Irish mobile market, the cost savings for operators associated with spectrum liberalisation will primarily benefit end users over time in the form of lower prices, increased innovation, and enhanced provision of existing services such as mobile broadband. However this would only occur if annual licence fees are maintained at reasonable levels that encourage efficient spectrum use while avoiding the extraction of value that would otherwise accrue to consumers.

Vodafone notes the interrelationship between the level of annual licence fees and the amount that bidders would be likely to bid in any proposed licence competition for the 900 MHz band using an auction mechanism. Clearly, the higher the level of annual licence fees, other things the same, then the lower the amount that operators would be willing to bid for spectrum blocks in a licence competition. Given the relevance of the question of annual licence fees to the bidding decisions of licence applicants, a review of the annual fees would have to be concluded prior to any spectrum award process so as to minimise regulatory uncertainty for operators and enable them to bid with full information about the charges they would face over the duration of the licence.

Q4. Do you agree with ComReg's proposal that an auction mechanism is the most appropriate format for granting future 900 MHz spectrum licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Vodafone strongly disagrees with ComReg's proposal to auction the total amount of spectrum (2 X 35 MHz) in the 900 MHz band prior to the expiry dates of the 900 MHz licences held by existing licensees.

This proposal will have adverse consequences for investment and innovation in the market. Existing 900 MHz licensees will be compelled to freeze investments in the period prior to the proposed auction since there is no certainty that those investments made in assets during this period would be usable in the event that existing licensees were unsuccessful bidders. ComReg's proposal will compromise the business operations of current licensees and the provision of services to their customers in the event that the existing licensees were to be unsuccessful in the spectrum award process. Furthermore, as the proposed approach to the future licensing of the 900 MHz band is entirely contrary to a previous definitive statement by ComReg on the future arrangements for this band, its implementation would undermine ComReg's credibility and

engender enormous regulatory uncertainty, negatively affecting competition and innovation in the long term.

Vodafone considers that the costs of this proposal would far outweigh any conceivable benefits. ComReg must revisit its proposals and adopt an alternative approach that fulfils the regulatory objectives as set out in the Communications Regulation Act of 2002. Vodafone's detailed assessment of the negative impact of ComReg's current proposals is set out more fully in subsequent sections of our response to this question. Our assessment will look at the following issues:

1. The failure to consider the option of renewal of existing 900 MHz licences
2. The inconsistency of the proposals with previous undertakings
3. ComReg's regulatory objectives
4. Legal considerations
5. Precedents in other EU countries
6. The impact of ComReg's proposals for existing licensees and consumers
7. The flaws in ComReg's arguments for the lack of negative impact
8. Assessment of the Cost Impact of ComReg's Spectrum Auction Proposals
9. The absence of unique benefits from the proposals
10. Critique of ComReg's welfare analysis
11. Alternative to Facilitate Competition via the Digital Dividend Spectrum

1. Failure to Consider Option of Renewal of Existing 900 MHz Licences

In section 7.2 of the consultation document ComReg states that it balances the size and scale of the Irish market, public policy considerations, social considerations, economic and market considerations, legal factors and expected demand and use, in order to determine the most appropriate allocation method. ComReg does not however provide any detailed assessment of these factors in the consultation document to justify its proposal to auction the entirety of the 900 MHz spectrum. The only reasons for ComReg's proposal that are explicitly set out are:

1. The importance of the band for mobile services and;
2. The expectation that, given the substantial portion of the 900 MHz band currently occupied by GSM networks, demand for the available spectrum will exceed supply.

These reasons do not provide a basis for ComReg's proposal to hold an auction for the whole 900 MHz band in preference to the credible alternative option of renewing the current licences of existing operators and assigning the currently unallocated spectrum in the band both to facilitate

UMTS 900 refarming and, potentially, market entry by a new operator. Indeed the key deficiency in ComReg's assessment is its failure to address the fundamental question that must precede any consideration of the optimal approach to the award of spectrum rights. This is the question of whether, following full consideration of its regulatory objectives, ComReg should renew the 900 MHz licences of existing operators or make the spectrum usage rights currently included in these licences available for award. As there is no reference whatever in the consultation document to any option other than the award of new licences for the entire 900 MHz spectrum band, ComReg inexplicably does not appear to recognise that the issue even arises.

Vodafone contends that the failure of ComReg to give any explicit consideration to the option of renewal of existing licences in the consultation paper is a critical flaw in its approach and that this, by itself, requires that ComReg's assessment of spectrum licensing in the 900 MHz band must be completely revised to include the appropriate consideration of this alternative option, following which the consultation must be re-issued. If ComReg has given consideration to the option of renewing the existing licences and rejected this in favour of its current proposal for the allocation of 900 MHz spectrum then it has omitted to explain the rationale for its decision in the consultation document and this is contrary to the requirement for openness and transparency in ComReg's regulatory approach.

Vodafone can only infer that ComReg makes the assumption, contrary to the evidence and the experience in other EU countries where the question of 900 MHz licence renewal has arisen, that the holding of a competition for the award of spectrum usage rights currently held by existing licensees is the only option available to it. As Vodafone sets out further below, this assumption is without basis. In fact the alternative option of renewal of existing 900 MHz spectrum licences is not only feasible but is the optimal approach because it avoids the substantial costs and risks associated with ComReg's current proposal. In Vodafone's view, once the public policy case for renewal of existing 900 MHz licences is accepted, the question of the appropriate method of awarding spectrum usage rights would relate only to all or part of the currently unallocated spectrum in the band and can be considered in this narrower context.

2. Inconsistency of Proposals with Previous Undertakings

The proposal to auction new licences for the entire 900 MHz spectrum band entirely contradicts a previous undertaking given by ComReg on the approach to the future arrangements for this band. Moreover as the previous undertaking given by ComReg raised the issue of the extension of the duration of the existing 900 MHz licences it is especially difficult to comprehend ComReg's failure to even consider this option in the consultation document.

Vodafone is alarmed by the absence of any proposal in the consultation document for the extension, on a demonstrable need basis, of the duration of the existing spectrum licences held by the mobile operators in the 900 MHz band until the end date of their respective 3G licences. A spectrum licensing approach for the 900 MHz band that does not incorporate a provision for extension of existing licences is entirely inconsistent with the definitive statement made by ComReg's predecessor, the ODTR, in its 2001 Information Memorandum on the original tender for licences to provide 3G services. In section 4.2 of ComReg's 3G Licence Tender Information Memorandum (Document No. ODTR 01/96) it is stated that:

> *Continued availability of existing spectrum assignments in the 900 MHz and 1800 MHz bands to mobile telecommunications licensees will be reviewed three years prior to licence expiry.* ***Retention of such spectrum will be on a demonstrable need basis until the end date of the 3G licences.*** [Vodafone's emphasis]

ComReg's current proposal does not however feature any provision to extend the retention by the mobile operators of their existing 900 MHz licences beyond their current expiry dates. Moreover there is no explicit consideration whatever of the option of extending the duration of licences held by the existing licensees in the 900 MHz band in the consultation paper even though it is clear that there is a pressing requirement for existing operators to retain access to this spectrum for the efficient provision of communications services to their customers.

Vodafone's 2002 bid for a 3G licence, and all planning thereafter, relied on the above statement in the 3G Licence Information Memorandum in good faith. Our 3G licence bid was developed on the basis of being able to operate an integrated 2G/3G network to provide mobile communications services to our customers, using a combination of our current holdings of 900 MHz, 1800 MHz and 3G spectrum, until the termination date of the 3G licence. This is clear from the text of Vodafone's 3G licence bid application document.

In section 4-4-2 of Vodafone's 3G 'B' licence bid document it is stated that: *"Our spectrum management approach to using frequency, efficiently covers GSM 900 MHz and 1800 MHz and 3G spectrum. We will use all three frequency bands to ensure that customers have access to least cost, high quality and seamless services."* The graph of forecast number of 2G base stations, Exhibit 21 on page 6-9, shows that Vodafone clearly indicated to ComReg at that stage the requirement in our plan for approximately 1,000 GSM 900 base stations in 2012 to meet traffic requirements and demonstrates that Vodafone assumed the continued availability of spectrum in the 900 MHz band after initial 900 MHz licence expiry in 2011. As stated on page 6-1 of the licence bid document, the financials detailed in the bid also related to our business as a whole, including 2G, 2.5G and 3G networks, consistent with the requirement set down in the ComReg tender document.

In addition the site roll-out plan in section 4-1-2 and the radio network design plan in section 4-3-2 contain several references to Vodafone's intent to use both 3G spectrum and the current spectrum assignments in the 900 MHz and 1800 MHz bands to meet coverage and data service provision targets over the duration of the 3G licence term.

Vodafone considers that ComReg's current proposals represent a totally unjustified and fundamental reversal of the definitive statement on the 900 MHz and 1800 MHz licence review contained in the 2001 3G Licence Information Memorandum. The current proposal to award new licences for all spectrum in the 900 MHz band, if implemented, would run entirely contrary to what existing licensees had, to this point, legitimately understood to be the conditions governing any future spectrum assignment in this band. Vodafone made it clear in its 3G Licence that it relied on access to 900 MHz spectrum beyond the initial expiry date of our existing licence in 2011. ComReg were aware of this and awarded Vodafone a licence on this basis.

ComReg's current proposals represent a radical departure from ComReg's previous undertaking. Such a departure creates substantial regulatory uncertainty, undermines the credibility of future statements by ComReg on the terms of spectrum usage rights, and thereby inhibits long term efficient infrastructure investment and innovation. These proposals therefore run counter to the regulatory objective of promoting competition.

In light of the adverse impact of ComReg's proposals for regulatory certainty and the incentives for efficient investment outlined above, Vodafone urges ComReg to adhere to its undertaking in section 4.2 of the 3G Licence Information Memorandum. ComReg must at a minimum review the existing spectrum assignments of mobile licensees in the 900 MHz band and develop

alternative proposals incorporating provisions for the extension of these licences at least until the expiry date of the 3G licences. Vodafone considers that an objective assessment of the spectrum needs of existing 900 MHz licensees would clearly establish that it is imperative for Vodafone, O2, and Meteor to retain assured access to the spectrum to allow for the continued efficient provision of 2G and 3G mobile communications services to customers.

3. Achievement of Regulatory Objectives

In Section 3.2 of the consultation document ComReg sets out its objectives under the Communications Regulation Act 2002 in carrying out its function of managing Ireland's radio frequency spectrum. The objectives set out are:

- Ensure the efficient management and use of the radio frequency spectrum in Ireland
- Promote competition
- Contribute to the development of the internal market; and
- Promote the interests of users within the Community

Of particular importance is the requirement under the 2002 Act to take all reasonable measures which are aimed at the promotion of competition including:

- Encouraging efficient investment in infrastructure and promoting innovation, and
- Encouraging efficient use and ensuring the effective management of radio frequencies and numbering resources.

Vodafone agrees with and supports ComReg's regulatory objectives as set out in the Communications Regulation Act of 2002 and believes that these provide a firm foundation for the assessment of the options for future licensing of spectrum in the 900 MHz band. We contend that a comprehensive assessment of ComReg's current proposals would show that they are inferior in all respects to the alternative option of renewal of existing 900 MHz licences in terms of advancing ComReg's regulatory objectives. In particular, they create extreme regulatory uncertainty and introduce significant risks of adverse outcomes that would seriously compromise the ability of existing operators to provide communications services to their customers. ComReg's current proposals to auction new licences for all the spectrum in the 900 MHz band are therefore entirely contrary to the promotion of efficient use and management of radio frequencies and the encouragement of efficient investment in infrastructure and innovation.

4. Legal Considerations

As there is no consideration in the consultation paper of the option to extend the duration of the existing 900 MHz licences it is possible that ComReg may mistakenly believe that there is a legal obligation to auction the spectrum currently being used by Vodafone, O2, and Meteor on the expiry of their respective licences. Vodafone does not believe that this is the case.

Spectrum provisions in Irish law reflect the EU framework and there is clearly no requirement that licences be auctioned at the end of their term. Article 14 of the Authorisation Directive states only

that any amendment to the terms of a licence must be objectively justified and proportionate and that interested parties should be given a reasonable opportunity to express their views on such amendments (a minimum four weeks for comments). There is no requirement that any amendment of the licence, whether of the duration or other terms, must always result in an auction.

Even if it is considered that an extension to the duration of a licence is a grant of a new right (which Vodafone does not consider is correct), Article 7 of the Authorisation Directive does not mandate an auction in such circumstances either. Article 14 states only that any amendments to the terms of a licence must be objectively justified and proportionate.

Article 7 states that any process for the allocation of rights must be open, in that interested parties must be given an opportunity to express their views on the proposal (Article 7.1 (b)). Any decision must be published giving the reasons for the proposed allocation process.

It is true that having decided to allocate new spectrum rights, ComReg must invite applications for the rights, but this does not mean that the NRA must conduct a “green field auction” or allocation process ignoring the fact that extensive network investment and deployment has already been undertaken by the existing licensees. To the contrary, Article 8 positively requires that this network investment must be considered, since ComReg is required to encourage “efficient use” and ensure “effective management” of radio spectrum. Recital 22 of the Authorisation Directive also requires that any allocation process should ensure “optimal use of those scarce resources” such as spectrum. The process of assessing whether to renew existing spectrum rights will, therefore, necessarily be different to the allocation of unused spectrum.

It is of particular relevance to this assessment in the context of the 900 MHz band in Ireland that there is currently a contiguous unassigned block of 2 X 12.8 MHz of spectrum available. The existence of this unallocated spectrum means that it is possible to accommodate at least some demand for spectrum usage rights from any potential applicant(s) that may emerge while also accommodating the need for additional spectrum to facilitate UMTS 900 refarming by existing licensees, without requiring the auction of the spectrum usage rights held under current licences.

Vodafone considers that an auction for new licences for the entirety of the spectrum in the 900 MHz band in the circumstances where existing licensees have made substantial long term network investments, where these licensees are currently providing communications services of enormous economic value using this spectrum, and where there is unallocated spectrum available in the band to meet potential demand from prospective licence applicants, is clearly inefficient and thus contrary to the requirements of Article 8 of the Framework Directive.

Article 7 states that any selection criteria must be objective, transparent, non-discriminatory and proportionate. It is therefore clearly open to ComReg (whether under Article 14 or Article 7) to consider the likely impact of a new entrant acquiring 900 MHz spectrum for which an existing licensee currently holds the usage rights, including the effect on existing mobile network operators and end users, and conclude on a preliminary basis that an extension of the existing 900 MHz licences is the most efficient use of that spectrum. However, it is clear that such a preliminary conclusion must be properly and objectively motivated and the conclusion and the reasons for it must be made available in a public consultation so that any interested parties (including the existing 900 MHz licensees, and any potential new entrants and user groups) can comment on the proposal and put forward any alternative proposals. In the absence of any counter-proposal, ComReg could amend the licences accordingly. If any alternatives are proposed then ComReg must consider what approach will yield the most efficient outcome and act accordingly.

In summary, the EU regulatory framework clearly provides that ComReg and spectrum licensing authorities in other member states must make a *prior* judgement in accordance with Article 8 of the Framework Directive as to whether to renew or seek to reallocate spectrum licences which are reaching their termination dates. Furthermore it clearly allows spectrum licensing authorities to conclude that there are public policy grounds for not reallocating existing spectrum licences in an award process whilst at the same timing acting in a manner which is objective, transparent, non-discriminatory and proportionate. Essentially, there are objective differences between existing users of spectrum (and the benefits they provide to consumers) and any prospective new licence applicants which allow spectrum licensing authorities such as ComReg to exercise discretion in determining whether and how to renew or extend existing licences. To conclude otherwise and assume that the criteria of Article 7 can only be met by means of an auction – if doing so itself undermines the achievement of the primary policy objectives specified in Article 8 of the Framework Directive and sections 10 and 12 of the Communications Regulation Act of 2002 – is to confuse process with objective. It cannot be the case that Articles 7 and 14 of the Authorisation Directive are required to operate in ways which undermine the attainment of the overall policy objectives of Article 8 of the Framework Directive, and ComReg's statutory objectives which are derived from the Framework.

5. Precedents in Other EU Countries

The absence of any legal requirement to auction 900 MHz spectrum held by existing licensees is demonstrated by the actions of authorities in other EU member states. The European Commission has not provided detailed guidance upon the issues arising from GSM spectrum licence renewal but the issues were discussed at some length in COCOM meetings in 2004[1]. During that debate the Commission noted:

> *The question of renewal of 2G rights of use must be considered in the context of the requirement to promote competition. Of particular relevance here is the need to encourage efficient investment in infrastructure and to promote innovation. It is clear that, when faced with uncertainty as to a renewal process, operators will not be incentivised to invest efficiently or to innovate. This is particularly the case where there could be a risk of non-renewal. Equally a renewal process that does not take into account the prevailing technological and market conditions could risk consolidating the position of incumbents at the expense of new entrants.*

Since then, the issue of 900 MHz spectrum licence renewal has arisen in a number of EU member states and authorities in France, Germany, Portugal, and the Netherlands have all decided to renew the terms of 900 MHz licences for the existing operators. Indeed, prior to ComReg's proposals, no EU member state to date had considered it appropriate or necessary to auction existing 900 MHz licences upon the expiry of their term. ComReg's current proposals for the 900 MHz band are therefore clearly without precedent in a European context.

It is notable that the authorities in these other EU countries share essentially the same broad regulatory and public policy objectives as ComReg, including the promotion of competition and ensuring the efficient management and use of the radio frequency spectrum, but concluded in all cases that the renewal of the terms of 900 MHz licences for the existing licensees was entirely consistent with the fulfilment of these objectives. None of these other countries considered that

[1] http://forum.europa.eu.int/Public/irc/infso/cocom1/library?l=/publicsdocuments2004/cocom04-21_rights/_EN_1.0_;http//forum.eu.int/Public/irc/infso/cocom1/library?l=/publicsdocuments2004/cocom04-37_04-21pdf/_EN-1.0_

they have any legal obligation under the EU Regulatory Framework or their own national laws to auction the spectrum in this band.

Vodafone contends, based on the provisions of the EU Regulatory Framework and the decisions taken on licence renewal in other EU countries, that there is no legal requirement for ComReg to auction the 900 MHz licences held by Vodafone, O2 and Meteor as they approach the expiry of their term. It is only necessary that an alternative decision by ComReg to renew the 900 MHz licences of the existing operators without an auction is objectively justified, transparent, and proportionate. Vodafone considers that the rationale for extending the duration of existing licences held by the operators in terms of the achievement of ComReg's regulatory objectives is overwhelming, and provided that all stakeholders are adequately consulted, a decision to adopt this approach for the 900 MHz band can be implemented.

6. Impact of ComReg Proposals for Existing 900 MHz Licensees and Consumers

Vodafone considers that ComReg has not conducted the necessary detailed assessment of the impact of its proposals for existing operators and end-users and has therefore drastically underestimated the likely resulting costs. In addition ComReg has failed to consider the merits of viable alternatives to the proposed auction of new licences for the entire 900 MHz spectrum band. Had a systematic assessment of the alternative option of extending the duration of the 900 MHz licences of existing licensees been undertaken in the consultation document, Vodafone believes that it would clearly indicate that this option would better advance ComReg's regulatory objectives while avoiding the considerable costs and risks that would arise from ComReg's current proposed spectrum allocation method.

Vodafone notes that ComReg's assessment of the impact of its proposal to award new licences for the whole 900 MHz spectrum band is carried out primarily in section 8 of the consultation document, at the stage where a prior decision had already been taken, without sufficient justification, to auction the spectrum usage rights held by existing operators in addition to the currently unallocated spectrum usage rights in the band. ComReg's assessment therefore includes no structured consideration of the likely impact of the alternative option of renewal of the existing 900 MHz licences without holding an auction for these spectrum usage rights. The scope of ComReg's impact assessment is therefore inappropriately narrow and the conclusions that follow from it are fundamentally flawed.

The central reason given by ComReg for its proposal to hold an auction for new licences covering the entire 900 MHz band is ComReg's expectation that, given that a substantial proportion of the 900 MHz band is currently occupied by GSM networks, the demand for the available spectrum will exceed supply. Vodafone contends that this point does not provide any justification for ComReg's proposed spectrum allocation approach. The demand for this spectrum is primarily a function of its favourable signal characteristics in terms of propagation and coverage and the ready availability of equipment (terminals and network) capable of operating in this spectrum for the provision of communications services of immense economic and social value. It is necessary for the existing 900 MHz licensees, but particularly Vodafone as an intensive user of its existing 900 MHz spectrum, to obtain access to some of the currently unallocated spectrum in this band to deploy UMTS while simultaneously maintaining the provision of existing 2G services to mobile customers. There is therefore clearly demand for additional 900 MHz spectrum from existing users on reasonable terms. However the nature and extent of any demand from other potential applicants for spectrum in this band is not easy to determine and is critically dependent on the terms on which it is made available.

Although it is highly likely that the demand for spectrum in the 900 MHz band would exceed supply if it were allocated on a first-come first-served basis at a zero price, for the reasons previously outlined, it is not valid for ComReg to conclude on this basis that an auction for new licences for *the entire 900 MHz band* is the optimal approach to spectrum allocation. As already set out, there are objective differences between existing 900 MHz licensees and potential new applicants for spectrum usage rights in the 900 MHz band. These differences are based on the substantial investments and network deployment that have already been undertaken by the former, and the fact that the existing licensees are providing on an ongoing basis, communications services of enormous economic value and social importance to end-users. ComReg has made a serious error in its assessment of the appropriate spectrum allocation approach by not attaching any weight to the particular benefits provided by existing licensees and failing to comprehensively analyse the costs and risks of serious disruption to these licensees and their customers from the consultation proposals.

The approach of auctioning licences for all spectrum in a band, which may be appropriate in a green field situation where there are no issues of previous major network investment and existing licensees providing key services using the spectrum to be considered, is entirely inappropriate to implement for the 900 MHz band where these factors are prominent. Any assessment of the appropriate spectrum allocation approach for the 900 MHz band that gives proper consideration to the objective differences between existing licensees and new applicants could only conclude that an auction of licences for the entirety of the 900 MHz band is not the most effective and proportionate means of achieving ComReg's regulatory objectives.

In section 8.2.1.2 of the consultation document ComReg itself acknowledges that there is the possibility of consumers facing 'some' disruption to, or interruption of, their mobile services arising from ComReg's proposals. The consultation document also correctly sets out the range of possible outcomes from the proposed auction process from which this disruption could occur for existing licensees. These outcomes are:

1. Failing to acquire any 900 MHz spectrum;

2. Acquiring less spectrum than it currently occupies; or

3. Acquiring spectrum which could not be used for a period of time (due to the differing expiry dates of existing 900 MHz licences)

A number of key points must be made in relation to these outcomes:

1. Scenarios two and three are non-exclusive. It is entirely possible that an existing licensee may obtain a licence for only a single 2 x 5 MHz spectrum block from the auction, less than their current 2 X 7.2 MHz holding, and that this block would also be effectively unavailable for use by them for an extended period of time (for example in the case where either Vodafone or O2 acquired only the proposed Block D, which Meteor would not be required to vacate until mid 2015). This possible outcome would for all practical purposes be equivalent in terms of the severity of its disruptive consequences for Vodafone or O2 and its customers, as the impact of scenario 1 (failing to acquire any 900 MHz spectrum).

2. Depending upon the number of bidders in the auction, the actual auction format used, and other factors, it is plausible that more than one, and perhaps all of the existing 900

MHz licensees could experience one of the above three outcomes, or a combination of outcomes 2 and 3. This would greatly magnify the disruption that would be faced by the existing 900 MHz licensees and their customers, while greatly complicating their efforts to maintain even existing services to their customers.

3. ComReg has made no attempt to quantify the probability that these outcomes would be realised for one or more of the existing licensees as a result of the proposed competitive award process for the full 900 MHz band. Given the significant proportion of the available spectrum that is unavailable for use until 2015 for the existing 900 MHz licensees other than Meteor (Block D, and depending on the auction option – also the partial or complete unavailability of Block C) and the possibility that ComReg will decide to reserve both Blocks A and B for new entrants as proposed under Licensing Option C, it can only be concluded that the cumulative probability of a seriously disruptive scenario affecting at least one of the existing 900 MHz licensees is extremely high. In fact under one variant of Option C that has been put forward by ComReg in the consultation document, reserving both Blocks A and B for new entrants only, it is certain at a minimum that one of the existing 900 MHz licensees would acquire a reduced amount of spectrum compared to that which it currently occupies.

It is entirely wrong for ComReg to propose to auction new licences for all the spectrum in the 900 MHz band when its resulting proposed set of licensing options raise considerable risks, or the certainty, of at least one existing licensee realising one of the seriously disruptive outcomes outlined by ComReg in the consultation document. It can not be credibly argued that a licensing approach that generates such unacceptably high risks of loss of spectrum for existing 900 MHz operators, with all the associated potential market disruption and costs for operators and consumers, is the approach that most effectively and proportionately achieves ComReg's regulatory objectives. In addition, as set out further below, the very high likelihood of occurrence and severity of impact, of market disruption to consumers from ComReg's proposals is not in any way limited due to the reasons set out in section 8.2.1.2 of the consultation document.

7. Flaws in ComReg's Arguments on Limited Impact of Proposals

(a) Significance of Access to Alternative Spectrum Bands

The first reason set out by ComReg to justify its expectation of the risk and impact of disruption being limited is that existing 900 MHz licensees have access to other spectrum with which to deliver existing services, and that while 900 MHz spectrum provides significant propagation advantages over other spectrum, it is not a prerequisite to providing mobile services to consumers. Vodafone contends that it is not the case that because it is technically possible to provide mobile services without 900 MHz spectrum, the risk and impact for consumers of the adverse outcomes previously outlined can be effectively limited. The access of existing 900 MHz licensees to other spectrum (in the 1800 MHz and 2.1 GHz bands) is irrelevant to limiting disruption from adverse 900 MHz auction outcomes as it would be prohibitively expensive and practically impossible for existing licensees to actually provide even the same level of service as currently using only this alternative spectrum. This is particularly the case given the short timeframes within which they would have to vacate the 900 MHz spectrum where unsuccessful in an auction. This is especially relevant for Vodafone and O2, who would have a maximum of just two years following notification of the results of an auction to move to providing services using a reduced 900 MHz spectrum allocation, or without spectrum in the band.

ComReg does not even acknowledge the issues of the economic and practical feasibility of existing 900 MHz licensees being able to maintain seamless provision of services in the event of partial or complete loss of access to 900 MHz spectrum. An adverse outcome in the proposed auction for existing licensees seeking to maintain the unaffected provision of communications services to their customers would result in their having to incur major costs including detailed network re-planning, the construction of large numbers of new base stations given the increased or total reliance on1800 MHz and 2.1GHz spectrum with their inferior signal characteristics relative to 900 MHz spectrum, upgrades of existing base stations, and the likely costs of use of spectrum optimisation techniques, among other costs.

Vodafone must emphasise that, even setting aside the prohibitive costs of these required measures, it would be practically impossible to complete the changes to the network to allow continuous unaffected service provision using only currently held spectrum other than 900 MHz and with as little as 2 years notice of having to vacate the 900 MHz spectrum. On the basis of historical experience regarding the time necessary to acquire additional base station sites, construct new base stations, and carry out necessary re-tuning and upgrades, the process would take substantially longer than the timeframe available under ComReg's proposals. Even under optimal conditions, if Vodafone's 900 MHz spectrum allocation were reduced to a single 2 X 5 MHz block following a competitive licence process, then we estimate that it would take a minimum of 4 years to make the necessary changes to the mobile network to enable adequate service to be provided using a reduced 900 MHz allocation and UMTS 900 refarming would be impossible. Under the alternative scenario of a complete loss of 900 MHz spectrum, the difficulties of maintaining existing service to customers, even under the most benign assumptions, would be insurmountable, and the costs substantially higher than under the partial spectrum loss scenario.

In light of the severe practical and financial difficulties of attempting to support anticipated levels of customer's voice and data traffic based on a network largely or exclusively reliant on spectrum in the 1800 MHz and 2.1GHz bands customers would, despite the best efforts of operators, be exposed to the risk of significant degradation of the quality of the services they receive. For example, an existing licensee that would partially or completely lose access to 900 MHz spectrum as early as 2011 would almost certainly be compelled to adopt spectrum optimisation techniques to increase capacity in their network and reduce the requirement for deployment of additional base stations. These techniques however, such as synthesised frequency hopping (SFH) or GSM half rate/adaptive multi-rate (AMR), trade off an effective increase in network capacity against the cost of reduced quality of service.

[Confidential]

While the extent to which these techniques could be deployed would be limited by the need to meet existing spectrum licence obligations in relation to QoS, service quality levels would likely decline to the minimum needed to meet licence obligations.

Given the practical impossibility of completing the required network changes to provide existing communications services, using 1800 MHz and 2.1 GHz spectrum only, in the short timeframes that would be necessitated by ComReg's proposals, it is likely that there would be significant shortfalls in network capacity and coverage over an extended period of time. This would have a material adverse impact on mobile customers, experienced in terms of less extensive coverage, reduced voice quality, lower data speeds, and increased congestion leading to an increased incidence of dropped calls.

These costs would also be experienced not only by the subscribers of the operator or operators attempting to maintain service provision without 900 MHz spectrum (or a reduced allocation), but also by subscribers of other networks when contacting subscribers of the affected operator. There would also be additional substantial impacts on other operators in the context where national roaming agreements and MVNO agreements are in place. If the capacity of an existing licensee's network has been reduced by the partial or complete loss of its 900 MHz spectrum usage rights, its ability to offer wholesale services and to compete in the wholesale market would be impaired or eliminated. The quality and coverage problems for the affected operator's customers caused by the loss of 900 MHz spectrum would inevitably also affect the customers of competitors when the latter would be on the affected operator's network, either as a result of national roaming deals or as customers of a MVNO. At a minimum, it would be likely that the affected operator would be unlikely to renew any existing national roaming agreements where it was the hosting network, and it would likely not be in a position to host new MVNOs or to renew existing MVNO agreements on the expiry of their term.

The likely inability of the operator(s) affected by loss of 900 MHz spectrum to compete in the wholesale market, at least for an extended period of time, would soften competition in the mobile market at the wholesale level. Any reduction in the number of players capable of effectively competing in the wholesale market would reduce the bargaining power of new entrants vis a vis the remaining operators capable of hosting them as MVNOs or augmenting their effective network coverage through national roaming agreements. The intensity of retail competition would diminish as a result.

It is clear that these likely impacts of an adverse outcome in the proposed 900 MHz auction for existing 900 MHz licensees would restrict, rather than promote, competition in the market and would therefore be completely counterproductive in terms of the achievement of ComReg's regulatory objectives.

The foregoing is in fact a relatively optimistic assessment of the likely negative impacts of the partial or complete loss of existing 900 MHz spectrum usage rights by one or more of the existing 900 MHz licensees as it assumes that these operators could be assured of the continued availability of their current 1800 MHz spectrum allocations until at least the termination dates of their 3G licences. However the availability of the operator's existing 1800 MHz spectrum allocations beyond 2014 and 2015 is in fact highly uncertain as there is no indication on the consultation document that the current spectrum usage rights of licensees in the 1800 MHz band will be renewed. It is reasonable to assume, on the basis of ComReg's current proposals for the 900 MHz band, that a similar proposal to auction the entirety of the 1800 MHz in 2013 will be adopted. The current uncertainty regarding the arrangements for the 1800 MHz band therefore has a similar impact to ComReg's current proposals for the 900 MHz band in terms of inhibiting investment in the network related to the use of this spectrum.

The effective inability of an existing 900 MHz licensee that would lose part, or all, of their current 900 MHz spectrum allocation to rely on the continued availability of the 1800 MHz spectrum, means that they would be compelled to rely exclusively on building out their 3G network capacity to compensate both for the loss of spectrum at 900 MHz, and also to make up for the potential loss of 1800 MHz spectrum from 2015. An exclusive reliance on 2.1 GHz spectrum to provide existing services would be substantially more costly than if future 1800 MHz spectrum availability could also be assured. The grave difficulties in avoiding shortfalls in network capacity, with resulting negative impacts for end users, would be also be an order of magnitude greater in the context of a primary or exclusive reliance on 2.1 GHz spectrum only.

Vodafone must emphasise that, even setting aside the prohibitive costs of these required measures, it would be practically impossible to complete the changes to the network to allow continuous unaffected service provision using only 2.1 GHz spectrum, with uncertain 1800 MHz spectrum availability, and with as little as 2 years notice of having to vacate the 900 MHz spectrum. On the basis of historical experience regarding the time necessary to acquire additional base station sites, construct new base stations, and carry out necessary re-tuning and upgrades, the process would take substantially longer than the timeframe available under ComReg's proposals, even under the most benign assumptions.

For the above reasons Vodafone contends that the first reason offered by ComReg to support its view that the likelihood of disruption to consumers arising from an adverse outcome for an existing 900 MHz licensee in the auction is not valid. It would not be economically or practicably feasible for an existing 900 MHz licensee, such as Vodafone, that loses some or all of their current 900 MHz spectrum to sustain unaffected service provision on the basis of access to alternative spectrum in the 1800 MHz and 2.1 GHz bands within the short timeframes that would be available to an unsuccessful bidder in the 900 MHz auction to vacate the spectrum.

(b) Relevance of Commercial Incentives

The second reason offered by ComReg in section 8.2.1.2 of the consultation document to support its view that the likelihood of disruption would be effectively limited is that there would be strong commercial incentives for existing 900 MHz licensees to ensure that consumers were not negatively affected if they did not gain new 900 MHz licences. ComReg also suggests that an existing licensee that failed to secure sufficient spectrum to service its customer base could maintain continuity of services by, for example, seeking to negotiate an interim MVNO agreement with any of the successful competition winners with adequate network coverage. Vodafone does not consider that this argument is a valid basis for ComReg's contention that the potential impact on consumers would be limited.

Vodafone agrees that there would be strong commercial incentives for existing 900 MHz licensees to ensure that consumers were not negatively affected if they did not gain new 900 MHz licences. However these incentives are irrelevant given that affected licensees, despite making all reasonable endeavours, would likely be unable to find a solution that allowed continuing unaffected service provision to consumers. As Vodafone has outlined previously, the availability of spectrum in alternative spectrum bands is in itself insufficient to minimise disruption, as unaffected service provision using only this alternative spectrum (2.1 GHz being the only spectrum available with certainty for this purpose) is neither practically nor economically feasible for an extended period upon losing the proposed 900 MHz spectrum auction. This is notwithstanding the undoubted commercial incentives facing operators, and all the measures that they would attempt to undertake, to limit the likelihood and impact of disruption.

(c) Feasibility of MVNO Agreements

ComReg's view that existing 900 MHz licensees that did not gain new 900 MHz licences under the proposed auction could maintain continuity of services by, for example, seeking to negotiate an interim MVNO agreement with any of the successful competition winners with adequate network coverage, is in Vodafone's view highly uncertain at best. In the first instance it must be recognised that it is entirely possible that more than one, or all, of the existing 900 MHz licensees could find themselves obtaining one of the three adverse auction outcomes outlined by ComReg in section

8.2.1.2. The likelihood of this occurring would depend on the number of other 900 MHz licence applicants, the level of their bids, and possible bidding errors (the probability of occurrence being related to the particular auction format selected) on the part of existing licensees. In this case one or more of the existing 900 MHz licensees could find themselves without 900 MHz spectrum, with a reduced allocation, or facing an extended period before 900 MHz spectrum would become available (eg. a 4 year gap in 900 MHz spectrum availability where Vodafone successfully bid for blocks covering spectrum occupied by Meteor) but the option of negotiating MVNO agreements to ensure continuity of services could be unavailable in a situation where the successful new entrant bidders for the new licences had not yet rolled out their own networks sufficiently and could not therefore host, or provide equivalent coverage, to the networks of unsuccessful bidders for the spectrum. In this case most, or all, of the customers of existing operators would face serious risks of service disruption or service degradation, without it being feasible for MVNO agreements to be negotiated until new entrants had rolled out their networks sufficiently. This could take at least 3-4 years for an operator rolling out its own network infrastructure from scratch.

ComReg's view that existing licensees that were unsuccessful in a 900 MHz spectrum auction could maintain continuity of service by the MVNO route also does not take account of the high probability that any new entrant, replacing an existing GSM operator, would roll out non-GSM technology only. In this event the provision of GSM services to existing customers could not be supported on the new entrant's network via a MVNO agreement, or even through customers porting to that entrant. Customers would be required to incur the costs of replacing their existing GSM handsets with alternatives compatible with the non-GSM (eg. UMTS) technology being used by the new entrant to continue to avail of mobile communications services with their existing provider or the new entrant. The necessity for large number of customers to incur these costs within a very short period of time would be disruptive to the market and harmful to consumer welfare.

ComReg may contend that these outcomes are unlikely to occur, but it has not even recognised that this scenario is one possible outcome of its proposal to auction the entirety of the spectrum. Given the severity of the impact of such outcomes for consumers, ComReg would be in neglect of its regulatory objectives if it were to adopt a process that allowed even a small probability of such outcomes occurring. If the possibility of such outcomes occurring exists as a result of ComReg's proposals then this must be explicitly acknowledged and not dismissed.

Even if only one existing licensee were to lose access to 900 MHz spectrum after losing in the proposed auction, it is highly uncertain that it would be able to negotiate an interim MVNO agreement with one of the other licensees that had been successful in the proposed 900 MHz auction. Vodafone notes that ComReg proposes in section 7.3.4 of the consultation document to incorporate conditions in the proposed new 900 MHz licences requiring the provision of MVNO hosting services in any licences issued following liberalisation. Vodafone must query the justification for and legal basis on which ComReg proposes to impose MVNO access conditions in licences without a finding of SMP following market analysis under the European Regulatory Framework.

ComReg states that it has in the past included MVNO access conditions in the licences awarded with larger spectrum assignments. The inclusion of these conditions occurred however in licence competitions, such as the original auctions for spectrum in the GSM bands and the original 3G licence auction that occurred prior to the entry into force of the current EC Communications Regulatory Framework. It is also relevant that those competitions took the form of 'beauty contests' where applicants voluntarily agreed to MVNO access conditions as part of their licence conditions. Vodafone must question the legal basis for ComReg's proposal in section 7.3.4 of the consultation document to incorporate licence conditions requiring the provision of MVNO hosting services in

any licences issued following liberalisation. Vodafone considers that the proposed automatic inclusion of a MVNO access condition in all new 900 MHz licences would be in breach of the EC Regulatory Framework.

Regulation 9(3) of the Access Regulations provides that NRAs cannot impose the obligations set out in Regulations 10 to 14 (including access obligations) on operators that have not been designated with SMP. In connection with this, Article 6.1 of the Authorisation Directive states that only the conditions listed in the Annex to the Directive may be attached to an authorisation and that only conditions in Part B can be attached to spectrum licences. Part B of the Annex does not include a MVNO access condition or similar provision.

Vodafone notes that point 8 of Part B of the Annex allows *"any commitments which the undertaking obtaining the spectrum usage right has made in the course of a competitive or comparative selection procedure."* Vodafone considers that this provision indicates that there must be a voluntary commitment by a licence applicant to accept a MVNO access condition as part of the terms, and therefore a choice on the part of the applicant, for such a condition to be valid. If a MVNO access condition is proposed to be imposed as a basic condition of all new licences, then Vodafone believes that this would fall outside the Authorisation Directive and could not legally be implemented. If a MVNO access obligation cannot be included as a basic condition of new 900 MHz licences, as is indicated by the Authorisation Directive, then there is no assurance of the ability of existing licensees to negotiate MVNO agreements in the event that they are unsuccessful in the proposed 900 MHz auction and it is therefore not valid for ComReg to claim that the likelihood of potential disruption to consumers can be effectively limited in this way.

(d) Mobile Number Portability

The third reason offered by ComReg in section 8.2.1.2 of the consultation document to support its view that the likelihood of disruption would be effectively limited is the claim that competing MNOs would have strong commercial incentives to offer substitute services to potentially affected customers, and that this process would be facilitated by the Mobile Number Portability (MNP) service.

As previously outlined, an entirely possible outcome of the auction process proposed by ComReg could leave all of the existing 900 MHz licensees without, or with reduced, 900 MHz spectrum usage rights or lacking 900 MHz spectrum for an extended period of time where the blocks awarded were those involving spectrum usage rights currently occupied by Meteor. In this scenario, mobile number portability will not effectively limit disruption to customers where new entrant operators would by 2011 likely not have built out their networks sufficiently to offer equivalent coverage to existing network operators, or may not have the network capacity to efficiently provide services to the number of subscribers seeking to port. Many subscribers of affected licensees may find that irrespective of their choice of network operator, the standard of service owing to network capacity and spectrum access issues across the operators may be materially inferior to that currently provided by existing 900 MHz licensees. Given the negative impact of such an outcome for consumers, ComReg would be in neglect of its regulatory objectives if it were to adopt a process that allowed even a small probability of such an outcome occurring.

8. Assessment of the Cost Impact of ComReg's Spectrum Auction Proposals

As ComReg has unacceptably failed to provide any quantification of the substantial costs that would result, for operators and consumers, of existing 900 MHz licensees partially or completely losing access to 900 MHz spectrum, Vodafone has carried out its own high level impact assessment of the costs that we and our customers would incur in the event that we had to move to support anticipated future levels of demand for mobile services without 900 MHz spectrum, or with a smaller allocation of this spectrum than our current usage rights for 7.2 MHz of spectrum, within 2 years.

Many of these costs, as previously outlined, are readily quantifiable (the costs of additional base stations, base station upgrades etc.) others, such as the impact on customers of reduced service quality (increased incidence of dropped calls and reduced voice quality) are less tangible. There would also be major opportunity costs arising from the inability to deploy UMTS in the 900 MHz spectrum, and the deferral of launch of innovative new products given the need to dedicate finite managerial, financial, and technical resources to addressing the challenge of merely maintaining adequate provision of existing services using reduced spectrum holdings. These costs are not confined to the affected operator or operators but also have broad and far-reaching negative effects on both consumers and the overall national economy.

While it is not attempted here to quantify the latter two categories of costs, given the limited time available in the present consultation process, these must be central to ComReg's assessment of the impact of its proposals. Vodafone describes them here together with an assessment of the broad magnitude of the costs that would be necessary to maintain ongoing provision of services with a partial or total loss of 900 MHz spectrum.

Vodafone does not provide here a detailed costing of the impact of loss of part or all of our current 900 MHz spectrum usage rights given the commercial sensitivity of the data and because, in the context where a competitive spectrum award process is being proposed, this would lead to detailed information relevant to Vodafone's valuation of the spectrum being released. The provision of detailed quantitative information on the costs arising from spectrum loss is therefore not possible as it would clearly be prejudicial to Vodafone's commercial interests.

Ofcom Analysis

Vodafone would emphasise that it is incumbent on ComReg, in proposing licensing options for the 900 MHz band, to conduct the necessary robust and detailed cost-benefit analysis demonstrating that the benefits of its proposals outweigh the costs. This analysis has not been provided in the current consultation paper. Moreover it cannot be maintained that these potential costs of its proposals are of marginal significance, Vodafone notes that Ofcom's assessment of the costs of the existing 900 MHz operators in the U.K. vacating three (2 X 5 MHz) blocks of spectrum, just part of their current allocations, would cost between £100m and £375m per operator (€126m - €472m)[1] and these estimated costs are likely significantly below those that would actually be incurred. Vodafone acknowledges that circumstances in the Irish and U.K. markets differ considerably in a number of respects, such as size, however even taking account of this, the outcome of the Ofcom analysis indicates the substantial size of the costs that would be incurred by existing 900 MHz licensees in Ireland in the event that they were unsuccessful in a competitive award process and had to rely on a reduced 900 MHz spectrum allocation.

[1] Ofcom consultation document: 'Application of spectrum liberalisation and trading to the mobile sector' in Annex 9: 'Costs of clearing and releasing 900 MHz spectrum', p264. Available online at http://www.ofcom.org.uk/consult/condocs/liberalisation/lib_annex.pdf

The Ofcom analysis did not consider in detail the likely costs of clearing the entire 900 MHz spectrum band (existing U.K. 900 MHz operators losing all 900 MHz spectrum) as this was not a proposal made by Ofcom in its consultation paper on the *'Application of spectrum trading and liberalisation to the mobile sector'*. However Ofcom did provide an estimate of the total cost of releasing all 900 MHz spectrum in 2010/2011 of £3bn to £4bn[1] (€3.78bn to €5.04bn) or £1.5bn to £2bn for each of the 900 MHz operators (Vodafone and O2) while indicating that the actual cost could be significantly higher. Again, even taking account of the considerable differences between the Irish and U.K. markets in terms of size and other characteristics, this analysis provides some indication of the enormous costs that would be imposed on an existing licensee in the event that it were to lose its entire existing spectrum allocation in a competitive licence process. Vodafone contends that costs of this scale would far outweigh the value of any benefits that could conceivably be expected from ComReg's spectrum auction proposals.

Vodafone's Cost Analysis of 900 MHz Spectrum Loss

Vodafone has carried out a high level assessment of the likely costs to us and consumers that would arise in the event that we were to lose all or part of our 900 MHz spectrum usage rights from mid 2011 resulting from failure to bid successfully in a competitive spectrum award process as proposed by ComReg. Vodafone considered 2 spectrum loss scenarios:

Scenario 1: Reduction of 900 MHz spectrum allocation from 7.2 MHz to 5 MHz from 2011

Scenario 2: Loss of Entire 900 MHz spectrum allocation from 2011

An alternative scenario, where Vodafone was successful in bidding only for spectrum blocks C2 and/or D (blocks identified under ComReg's three licensing proposals) which would not be available for Vodafone to use until mid 2015 is regarded as equivalent to scenario 2 in terms of its cost and disruption impact. This is reasonable as Vodafone would not have access to 900 MHz spectrum in these blocks for a period of 4 years from the expiry of its existing licence and would be presented with the same options in terms of remedial actions as under scenarios 1 and 2.

Vodafone also considered the most plausible options available to us to attempt to maintain existing service, and mitigate the impact on customers, under the two spectrum loss scenarios outlined. Two options based on the implementation, from a theoretical standpoint, of equivalent capacity and coverage as currently provided by the existing 900 MHz network and spectrum allocation using either 1800 MHz spectrum or 2100 MHz spectrum within the available 2 year timeframe were considered:

Option 1: Re-engineer network to obtain required capacity through reliance on 1800 MHz spectrum

Option 2: Re-engineer network to obtain required capacity and coverage through reliance on 2100 MHz spectrum

[1] Ibid, p266

Vodafone considers that option 1 would be preferable to option 2 given the relatively lower costs of building out network capacity at 1800 MHz rather than 2100 MHz. However given the current uncertainty around continued access to 1800 MHz spectrum after initial licence expiry at the end of 2014, the cost impact of the alternative option of building out the required network capacity and coverage to support our forecast network traffic levels in the year 2011 using 2100 MHz spectrum have also been assessed.

A notable additional cost of option 2 would relate to the need to drive accelerated 3G handset migration beyond current forecast levels in order to ensure continued service to end users. At a minimum, this would require increased subsidisation of 3G handsets to ensure that their price would be equivalent to 2G handsets. In estimating this cost for operators of clearing 900 MHz spectrum in the U.K., Ofcom assumed a subsidy costing between £75-£125. Even if a conservative €100 per subscriber cost is used, this cost of option 2 alone would amount to tens of millions of euros.

Although spectrum optimisation techniques have already been extensively deployed in Vodafone's network, both options assume that further deployment of spectrum optimisation techniques would be used to increase effective capacity on the network to the fullest extent possible, consistent with maintaining acceptable quality of service for end users.

The costs quantified by Vodafone in its assessment include the costs of spectrum optimisation techniques that could be deployed, the costs of upgrading existing base station sites (network component costs etc.), the costs of acquisition and construction of additional new base station sites that would be required (costs of negotiating planning permission, network component costs), network frequency re-tuning costs, increased opex costs (rent and energy costs associated with the increased number of base stations), costs of decommissioning and removing 900 MHz equipment (applicable under Scenario 2), and the costs of accelerating migration of customers to 3G handsets beyond current forecasts by 2011 (applicable under Opton 2).

Due to the constraints imposed by the relatively short consultation period and difficulties around quantification, a number of other significant costs such as the negative impact on quality of service to end users (increased congestion and dropped call rates) and the opportunity cost of being unable to deploy UMTS technology in the 900 MHz band with a reduced allocation, or no holding of 900 MHz spectrum, are not included in the analysis. However, these are vital impacts that must be considered in a comprehensive cost benefit analysis.

For the purposes of the analysis Vodafone has made the entirely unrealistic assumption that the totality of these costs would be incurred fully over the 2 year period between the conclusion of the proposed 900 MHz spectrum auction in mid-2009 and the expiration of Vodafone's existing 900 MHz licences in mid-2011. In reality the acquisition of the necessary additional new base station sites would take substantially longer than 2 years, if the necessary sites could be obtained at all (due to planning difficulties etc.), while limited labour and technical resources would constrain the rate of new site upgrades and other activities required so as to make the 2 year timeframe for execution of the options completely unviable. The cost estimates provided are essentially theoretical given that a 2 year timeframe for execution is impossible to achieve.

Vodafone has in addition had to make a range of simplifying assumptions in order to make the cost modelling exercise manageable. Many of these assumptions, such as the assumption that 3G customers are spread uniformly across the network, are optimistic in terms of the deriving the costs of implementing the previously outlined options and therefore understate the difficulties and costs associated with implementation.

The combination of the two possible spectrum loss scenarios with the two response options considered by Vodafone gives four estimates of the likely cost impact to Vodafone in the event that it was to be unsuccessful in an auction.

Estimated Costs of 900 MHz Spectrum Loss

[Confidential]

9. Absence of Benefits from ComReg's Proposals

Vodafone does not see any benefits from ComReg's current proposals that could conceivably justify the substantial associated risks and costs previously outlined. The auction of 900 MHz spectrum usage rights currently held by existing licensees should only be considered if there is a serious prospect that the existing firms will not win the auctions. If this is not so then auctions are simply a means of extracting rents from the existing mobile operators. This cannot be one of the objectives for licensing under the EU Framework as it does not in any way relate to the achievement of the objectives of the promotion of competition and ensuring the efficient management and use of the radio spectrum. Even if rent extraction were a justifiable objective (which it is not in Vodafone's view), there are other more efficient means of extracting additional rents from the industry which avoid the costs and inefficiencies of ComReg's proposals, as already outlined by Vodafone, and which still comply with ComReg's regulatory objectives.

ComReg has provided no indication whatever in the document that it believes that there are prospective licence applicants that would use existing licensee's 900 MHz spectrum more efficiently, or use it for the provision of services of higher economic value, than the incumbents. Nor has ComReg stated this as a potential benefit of its proposed spectrum allocation approach. It must therefore be assumed that the primary motivation for ComReg's proposed approach to auction new licences for the whole 900 MHz band is the extraction of rents. This motivation is unrelated to ComReg's regulatory objectives under the 2002 Communications Regulation Act and is not a valid basis for ComReg's proposed auction approach.

Vodafone must also highlight what we consider to be the particular vulnerability of ComReg's proposed spectrum allocation approach to entities motivated by the prospect of speculative financial gain, and who have no serious intention of providing service to consumers. In the context where existing 900 MHz licensees have built out mobile networks heavily reliant on use of this spectrum to provide mobile services to their customers, there is an incentive for individuals or other entities to bid for spectrum in the knowledge that if they are successful in an auction there would be a significant likelihood that one or more of the existing licensees would be left with insufficient or no 900 MHz spectrum to provide its current level of services. Clearly, given the exorbitant cost for current licensees of vacating 900 MHz spectrum, and the considerable uncertainty around obtaining a MVNO or national roaming agreement, existing operators would find themselves in a very weak bargaining position. It would be rational for a successful bidder motivated by the prospect of short term financial gain to maximise their bargaining strength in terms of a MVNO deal or in transferring ownership of the spectrum. Given the pressing requirement on existing licensees to obtain access to the spectrum quickly, bargaining strength would be maximised through brinkmanship by delaying agreement until close to the time that the existing licensee's current licence is due to expire. This would create immense uncertainty for the existing licensees and their customers, and by endangering unaffected service provision, would put customers at risk.

Existing licensees may be compelled to agree to unreasonable terms to gain access to this spectrum for the provision of their services, or to otherwise agree arrangements for the transfer of the spectrum on terms which allow the speculator to profit from their investment. This outcome would produce gains for the speculator and extract gains for the Government, but would otherwise achieve nothing in terms of advancing public policy objectives and providing benefits to end users. Vodafone notes that as ComReg has not provided any details in the consultation document on the precise auction format to be used, the risk of bidding errors on the part of existing licensees, and the corresponding opportunity for speculators, could be very significant. ComReg must not implement a proposal that would lead to a significant risk of outcomes that reward speculative behaviour while doing nothing to promote competition, the interests of end-users, or the efficient management and use of the spectrum.

In section 8.2.2, ComReg highlights that its proposals, the auction of the entire 900 MHz band and a 2 X 10 MHz spectrum limit per operator, facilitate at least one new entrant in obtaining a minimum 2 X 5 MHz block. Benefits to consumers in terms of increased choice, lower prices, better service and the earlier introduction of new products and services are attributed to a successful acquisition of 900 MHz spectrum by new entrants in an auction. However even if ComReg's welfare analysis is accepted, and Vodafone would question the extent of the benefits of new entry estimated by ComReg given the robust infrastructure based competition that is already present in the mobile market, new entrants can also be effectively facilitated by alternative options than ComReg's proposals to auction new licences for the entire 900 MHz band.

The facilitation of new entrants to obtain spectrum in the 900 MHz band is not a feature that can only be provided on the basis of ComReg's current proposals. Given the significant amount of currently unallocated spectrum in the band, alternative options are feasible that allows for the renewal of the 900 MHz licences held by existing licensees whilst not precluding new market entry, for example by using an auction or other spectrum assignment mechanism for at least some of the currently unallocated spectrum in the band for this purpose. This alternative option has the same merits as ComReg's proposal in terms of affording new entrants the opportunity to acquire spectrum in the band whilst avoiding the substantial risks and costs associated with the generation of uncertainty around existing licensees' access to 900 MHz spectrum, and the potential partial or complete loss of access to the spectrum by one or more of the existing licensees.

As the facilitation of competition through allowing new entrants the opportunity to obtain access to 900 MHz spectrum is not a unique benefit associated with ComReg's current proposals, it cannot be advanced as an overriding benefit that justifies the auction of the entire band. In fact it is not necessary to auction new licences for the full 900 MHz band in order to incorporate this feature in ComReg's proposed future arrangements for the spectrum.

ComReg may consider that a new entrant at 900 MHz would require more than a single 2 X 5 MHz block and that Vodafone's alternative proposal is therefore inadequate. However any perceived increased benefit in terms of a new entrant or entrants obtaining more than one 2 X 5 MHz block would be at the cost of one or more existing operators losing some or all of their existing 900 MHz spectrum allocation, with adverse consequences for the provision of services to end-users. ComReg's analysis of the welfare effects of new entrants (Annex F of the consultation document) provides no basis for the conclusion that a proposal to reserve multiple blocks of spectrum for new entrants has a positive net benefit for society.

Even if it is accepted that the analysis in Annex F of the consultation paper is correct, the model does not include within its scope any consideration of whether the benefits of allocating multiple blocks of spectrum for new entrants exceed the costs. To justify the reservation of multiple blocks

for new entrants, ComReg must demonstrate that the benefits of additional entry exceed the costs of the certain loss by one or more existing licensees of at least some of their current 900 MHz spectrum usage rights allocation. No assessment is carried out in Annex F or elsewhere in the consultation paper to prove that there is a net benefit from proposals of this type, such as the proposed licensing Option C set out by ComReg. Vodafone considers that it is very likely that the cost of reducing an existing licensee's current spectrum allocation would, in terms of the resulting adverse impact on its ability to provide services to existing customers, significantly outweigh any conceivable benefits in terms of increased potential for new entrants. In the absence of evidence of a positive net benefit to society, a proposal that new entrants should have the opportunity to obtain more than one 900 MHz block is neither objectively justified nor proportionate.

10. Critique of ComReg's Welfare Analysis of Effect of Changes in Mobile Market Structure

In the first instance it must be stated that even if it were the case that ComReg's assessment of the welfare effects of changes in the market structure of the mobile market in Ireland (set out in Annex F of the consultation paper) were correct, this does not provide any justification for ComReg's specific proposals for the allocation of spectrum in the 900 MHz spectrum band.

The conclusions of ComReg's model are that the number of firms in the market is very important and that choosing an option which could facilitate competition and new entry into the mobile market is important, hence ComReg's preference for spectrum aggregation limits. However the model and its conclusions support *any* option that could facilitate competition, not just the specific proposals set out by ComReg in the consultation document. As previously stated, the facilitation of new entrants to obtain spectrum in the 900 MHz band is not a feature that can only be provided on the basis of ComReg's current proposals. Given the significant amount of currently unallocated spectrum in the band, alternative options are feasible that allow for the renewal or extension of the 900 MHz licences held by existing licensees whilst not precluding new market entry, for example by using an auction or other spectrum assignment mechanism for at least some of the currently unallocated spectrum in the band. Vodafone has set out a feasible proposal along these lines in the response to question 17 which also has the merit of avoiding the costs and risks of disruption that arise from ComReg's proposed spectrum licensing options.

Vodafone contends that there fundamental shortcomings in ComReg's model that cast serious doubt over the validity of its conclusions on the welfare effects of an additional entrant in the 900 MHz band. These shortcomings are in two areas:

(a) The selection of the model used

(b) The assumptions on ARPU trends

Use of the Cournot Model

The fundamental assumptions underlying the nature of competition in a Cournot model make it highly unsuitable as a way of proxying the nature of competition in mobile markets. In particular, in the Cournot oligopoly model, operators are assumed to make decisions about what quantity they are going to produce of a homogeneous good, with knowledge of the characteristics of demand, and under the assumption that other operators will do exactly the same. They then 'bring' their quantities to market, and price gets determined on the basis of the sum of quantities 'brought' to market (and the characteristics of market demand). It is very unclear how this process of

determination of quantity and price, even as a simplified model, has any relationship with the way in which mobile markets operate. In mobile markets:

- quantity decisions are not fixed in advance,
- operators can and do engage in robust price competition, and
- both the overall capacity installed, and the actual volume of calls that can be supplied, can be varied by operators and is not 'fixed'.

Vodafone therefore rejects ComReg's contention that mobile firms set capacity in a first phase, and prices in a second phase – the rationale used by ComReg to justify the use of the Cournot model.

It is notable that ComReg is apparently uncertain about the appropriateness of using the Cournot model, as indicated by the admission that it has also considered alternative models such as the differentiated Bertrand model. It is unclear whether ComReg has also conducted analyses using alternative models, and if so whether the conclusions from these models are consistent with the Cournot model that has been used. ComReg should provide clarification in this regard.

Assumption on Long term ARPU Trend

In addition to selecting an inappropriate model to estimate the welfare effects of a change in the number of market players, Vodafone contends that the third assumption set out by ComReg for the base case of the model, that subscriber volumes and ARPU values will remain constant for the 15 year period under consideration in the model, is grossly unrealistic given what is known about current existing trends in ARPU. Mobile ARPU across the industry has been in a clear downward trend for a considerable period of time and, given the intensifying competitive pressures in the mobile market, this trend will certainly continue in the medium to long term. An assumption of constant ARPU values for a 15 year period is therefore entirely at variance with what could reasonably be concluded from the available market data and has the effect of considerably overstating the benefits estimated by the model of an increase in the number of mobile market players.

11. Alternative to Facilitate Competition Via Digital Dividend Spectrum

It is an explicit assumption of ComReg's welfare model in Annex F, and an implicit assumption of the overall analysis in the consultation paper, that a new entrant operator requires an allocation of 900 MHz spectrum to be an effective competitor. This assumption is not valid as if it is considered that the allocation of spectrum usage rights below 1 GHz to new entrants is necessary for new entrants to compete effectively then a licence award process for the Digital Dividend spectrum in the UHF band would provide a better route than the proposed 900 MHz spectrum award process to facilitate this. As the signal characteristics of the UHF band are superior to those of the 900 MHz band, any new entrant operators would be in a more favourable position if they were to obtain spectrum usage rights for a portion of the Digital Dividend spectrum rather than a 900 MHz licence. Importantly, facilitating competition through a competitive award process for the Digital Dividend spectrum would not raise issues of risking serious disruption and costs for existing licensees and

consumers as in the case of the 900 MHz band as there are no existing mobile licensees in the UHF band.

Vodafone considers that an overall spectrum cap limiting the amount of Digital Dividend spectrum that existing 900 MHz licensees could bid for would be one approach in terms of structuring the award process to facilitate a new entrant or entrants in obtaining a spectrum licence. The facilitation of competition through a spectrum award process for the Digital Dividend spectrum would require ComReg to expedite detailed planning for the allocation of the UHF spectrum to be freed up by digital switchover and to maximise regulatory certainty regarding the future arrangements for this band at an early stage.

Conclusion

It is entirely inappropriate for ComReg to propose to auction new licences for all the spectrum in the 900 MHz band when its resulting proposed set of licensing options raise considerable risks, or the certainty, of at least one existing licensee realising one of the seriously disruptive outcomes outlined by ComReg in the consultation document. It can not be credibly argued that a licensing approach that generates such unacceptably high risks of loss of spectrum for existing 900 MHz operators, with all the associated potential market disruption and costs for operators and consumers, is the approach that most effectively and proportionately achieves ComReg's regulatory objectives.

Q5. Do you agree with ComReg's proposal to place a cap of 2 X 10 MHz on the amount of spectrum that any one licensee can hold in this band? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Vodafone considers that if ComReg decides to hold a competitive licence award process for all the spectrum in the 900 MHz band, despite the evidence provided by Vodafone in question 4 that this measure would be inappropriate, disproportionate to achieve regulatory objectives, and insufficiently justified, then a cap of 2 X 10 MHz per licensee would be preferable to no spectrum cap being put in place.

A 2 X 10 MHz spectrum cap would be warranted in the context of the limited amount of spectrum available in the 900 MHz band and because the absence of a spectrum cap, as proposed, would considerably increase the risk that one or more of the existing licensees would obtain less spectrum than they currently hold, or fail to obtain any 900 MHz block licences, in an auction process for the full 900 MHz band.

However in the event that a 900 MHz spectrum licence auction were held, with a 2 X 10 MHz spectrum cap per bidder in place, and no bidders for spectrum licences other than the existing licensees participated (the probability of this outcome occurring is difficult to define and would depend on the level of the reserve price and the detailed terms of the proposed new licences) then ComReg should suspend the 2 X 10 MHz spectrum cap and move rapidly to establish alternative arrangements that would allow the existing licensees to utilise the spectrum left unallocated in the auction. This approach would ensure that the 900 MHz spectrum could be fully utilised to facilitate the deployment of UMTS technology in the band rather than leaving some 900 MHz spectrum

unused for an extended period and would be consistent with achieving the regulatory objectives of promoting innovation and ensuring the efficient use of the spectrum.

Q6. Do you agree with ComReg's proposal to implement a service neutral licensing regime for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Vodafone's position on this issue is without prejudice to our view, as set out in the response to question 4, that ComReg's proposals to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act.

Vodafone agrees with the proposal to implement a service neutral licensing regime for future 900 MHz assignments. Liberalisation of spectrum rights of use in these bands is important for maximising the economic and social benefits for end users from use of the valuable spectrum resource.

Q7. In the absence of spectrum trading what do you consider to be the most appropriate duration for new licences issued in the 900 MHz band? Please provide supporting arguments with your answer.

Vodafone's position on this issue is without prejudice to our view, as set out in the response to question 4, that ComReg's proposals to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act. Vodafone believes that there are strong public policy grounds for renewing the terms of the licences currently held by the existing licensees, without re-auction, until 2021.

Vodafone believes that the optimal policy for the duration of licences would be to extend the licences of the existing 900 MHz licensees at a minimum until the end date of the 3G licences in 2021. As set out in the response to question 7, Vodafone believes that ComReg should change the approach to the duration of licences in the 900 MHz band from issuing licences with a fixed term to issuing licences of indefinite duration but with a minimum duration until 2021, and with five years notice of revocation on the basis of conditions clearly defined at the outset. Any new licences issued for the currently unallocated spectrum in the band other than for the existing licensees should be on the same terms. This approach will allow a common termination date for all licences no earlier than 2021 and will provide regulatory certainty to the market.

If, notwithstanding Vodafone's view on the optimal licensing approach, ComReg decides to auction new licences for all the spectrum in the 900 MHz band, then a common termination date for all new licences would be appropriate. If licences of a fixed term are proposed, which would not be the optimal approach in Vodafone's view, then new licences for the currently unallocated spectrum in the 900 MHz band should be longer than ComReg's current proposals of 10-15 years. Vodafone would favour a 20 year term for these licences and a term for licences for spectrum that would not become available until 2011 or 2015 that would allow for a common termination date for all 900 MHz licences.

Q8. Do you agree with ComReg's proposal that a common termination date should be applied to all new licences in the 900 MHz band? Please provide supporting arguments with your answer.

Vodafone's views in relation to the optimal approach to licence duration and licence termination dates are set out in the response to question 7.

Q9. Do you agree with ComReg's proposal to include a MVNO licence obligation in future 900 MHz spectrum licences? Please provide supporting arguments with your answer.

No. Vodafone questions the legal basis for ComReg's proposal in section 7.3.4 of the consultation document to incorporate licence conditions requiring the provision of MVNO hosting services in any licences issued following liberalisation. Vodafone considers that the proposed automatic inclusion of a MVNO access condition in all new 900 MHz licences would be in breach of the EC Regulatory Framework.

The Authorisation Directive 2002/20/EC establishes that Member States may not impose any restrictions on providers of electronic communications services other than those contained in a general authorisation. Article 6.1 of the Authorisation Directive states that only the conditions listed in the Annex to the Directive may be attached to a general authorisation. Article 6.2 then permits NRAs to impose certain specific conditions, as permitted by (and in accordance with the terms of) other provisions of the Framework, including SMP conditions and more specifically access conditions, which can be imposed under Article 8 of the Access Directive 2002/19/EC.

Article 6.1 goes on to state that additional conditions can be imposed as a condition of the award of radio frequencies or numbers, but that only conditions in Parts B and C of the Annex to the Directive can be attached to spectrum licences and number allocations respectively.

Article 6.1 also has an overarching requirement that any conditions must be objectively justified, proportionate, non-discriminatory and transparent. Recital 23 also states that any such conditions have to comply with the objectives and principles of Article 8 of the Framework Directive, which include the promotion of competition.

Part B of the Annex does not include an MVNO access condition or similar. Access conditions are dealt with in the Access Directive (Article 12). Article 8.3 of the Directive states:

> *"National Regulatory Authorities shall not impose the obligations set out in Articles 9 to 13 on operators that have not been designated in accordance with [the SMP process]."*

This prohibition is prefaced with a series of exceptions, since the prohibition is without prejudice to the provisions of, inter alia, Condition 7 in Part B of the Annex to Directive 2002/20/EC (Authorisation Directive) as applied by Article 6(1) of that Directive.

In Vodafone's view the only possible scope for the inclusion of MVNO access conditions, in the absence of SMP, is Condition 7 of Part B of the Annex which allows:

"any commitments which the undertaking obtaining the usage right has made in the course of a competitive or comparative selection procedure."

Vodafone contends that this implies an element of choice on the part of the bidder. However if ComReg decides to automatically impose MVNO access obligations on all new 900 MHz licences, as currently proposed in the consultation paper, then that is not a commitment made by the operator in a competitive selection procedure, it is a basic condition of the licence imposed by the NRA. Vodafone therefore considers that this proposal falls outside the Authorisation Directive and could not be legally implemented by ComReg.

Q10. Do you agree with ComReg's proposal to introduce technology neutrality in the 900 MHz band? Please provide supporting arguments with your answer.

Yes. Vodafone supports the WAPECs approach and believes that a technology neutral licensing regime should be introduced in the 900 MHz band subject to co-existence and harmonisation issues being effectively addressed. Vodafone believes that technology neutrality, by allowing the deployment of innovative technologies such as UMTS will improve the efficiency with which the spectrum is used and allow the enhanced provision of services such as mobile broadband that have proven to be popular with, and of enormous value to, end users.

Q11. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 X 5 MHz for future 900 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Vodafone's position on this issue is without prejudice to our view, as set out in the response to question 4, that ComReg's proposals to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act.

If, notwithstanding Vodafone's grounds for objecting to ComReg's current proposals, ComReg decides to auction new licences for all or part of the spectrum in the 900 MHz band, then a minimum spectrum block size of 2 X 5 MHz would be appropriate as this is the minimum block size feasible for the deployment of UMTS services. Vodafone considers however that any spectrum award process conducted on the basis of auctioning 2 X 5 MHz blocks must facilitate applicants in obtaining contiguous blocks of spectrum where they wish to do so. In an auction format this would require a bidding process that would allow licensees to submit sets of package bids for combinations of frequency specific contiguous spectrum blocks up to the maximum spectrum cap (2 X 10 MHz). Ensuring access by successful applicants to contiguous spectrum blocks, where they require this, should maximise the efficiency with which wideband technologies can be deployed, will avoid the risk of allocating stranded blocks of limited value, and will minimise the requirement for guard bands.

Q12. Do you agree with ComReg's frequency co-ordination and interference mitigation proposals in the 900 MHz band in relation to new licences? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Vodafone's position on this issue is without prejudice to our view, as set out in the response to question 4, that ComReg's proposals to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act.

Vodafone agrees with ComReg's frequency co-ordination and interference mitigation proposals in the 900 MHz band subject to the applicants in any spectrum award process being effectively facilitated to obtain contiguous blocks of spectrum where they wish to do so. As set out in the response to question 11, ensuring access by successful licence applicants to contiguous spectrum blocks, where they require this, should maximise the efficiency with which wideband technologies can be deployed, will avoid the risk of allocating stranded blocks of limited value, and will minimise the requirement for guard bands.

Q13. Do you support Option A? Please provide supporting arguments with your answer.

No. Vodafone considers that Option A is the most flawed of the three licensing proposals set out by ComReg.

Key problems associated with ComReg's proposal to auction all spectrum in the 900 MHz band in the form of new licences arise from the fact that existing licences in the band have differing termination dates and that the licence blocks that ComReg proposes to auction are not aligned with existing licensee's spectrum holdings. As ComReg's proposal leads to different spectrum block licences coming available for allocation at different times, with differing licence durations and differing spectrum block sizes (as in the case of block C1 and C2 relative to the other blocks), the proposed block licences are highly imperfect substitutes for one another. The non-homogeneous nature of the proposed spectrum blocks would greatly complicate the decisions of bidders in a competitive award process and, at least in the case of some existing licensees, would greatly restrict the options available to obtain the amount of spectrum necessary to sustain unaffected provision of existing services to customers while also supporting innovative new services. The proposal to auction all spectrum in the 900 MHz band therefore limits the probability of the spectrum being allocated efficiently. This problem is common to all three of the licensing options proposed by ComReg, but is particularly acute in the case of Option A.

Vodafone does not agree that holding three separate licence competitions for the available spectrum in the 900 MHz band (Option A) offers any advantages over the alternative of holding a single competition for all the spectrum at a relatively early stage (Option B). The effect of Option A is to artificially restrict the spectrum that can be bid for at any one time, potentially leading bidders in the context of uncertainty about conditions in future licence competitions, to bid for example in Licence Competition 1 for spectrum that they would not have been their preference if all the 900 MHz spectrum were auctioned in a single competition (for example if an existing licensee favoured spectrum blocks most closely aligned with their current holding so as to minimise re-tuning and other costs). Moreover, this approach would create an extended period of uncertainty for one or more of the existing licensees and/or potential new licensees in the event that they were not to

obtain spectrum in the initial, or subsequent licence competition. For existing licensees, this uncertainty would lead inevitably to infrastructure investments and innovation being frozen, with impacts for customers in terms of delays to the introduction of new and enhanced services, until all the licence competitions were completed. As existing licensees would not obtain full visibility of the future spectrum arrangements in the band at an early stage, this would also limit the already very short timeframes available for them to attempt to make alternative arrangements in the event that they were to be unsuccessful in obtaining the 900 MHz they required in advance of the expiry of their existing licences.

With respect to the three separate licence competitions proposed, Vodafone finds it very difficult to understand the rationale for holding two licence competitions separately for blocks A, B and C1 (Licence Competition 1) and for blocks E, F, and G (Licence Competition 2) when it appears that Licence Competition 2 is proposed to be held quite soon after licence competition 1. Vodafone considers that it would be straightforward, and more efficient in terms of utilisation of the regulator's and prospective bidder's resources if these two competitions were proposed to be amalgamated and held at the same time. This would however only partially mitigate the problems associated with the licensing proposal.

The deficiency of Option A in terms of providing the necessary regulatory certainty to the market has been recognised by ComReg in section 8.4.1.3 of the consultation document and it is therefore difficult to understand why this fundamental problem with the licensing option has not led ComReg to already exclude it as a viable approach for the proposed competitive award process in this band.

The proposal for non-standard block licences (C1 and C2) is a further significant shortcoming of Option A. This feature, as ComReg recognises, reduces the likelihood of contiguous 2 X 10 MHz blocks being obtained by existing licensees. However this feature of the licensing proposal is also highly problematic as the size of the licence blocks (2.8 MHz for C1 and 2.2 MHz for C2) and the fact that block C2 is held by one of the existing licensees, Meteor, until mid 2015 means that the blocks are structured such that they would have the effect of introducing an important asymmetry between bidders in the proposed competitive award process.

It is unlikely that any other existing licensee, or other licence applicant, would place a higher value than Meteor on block C1 given that for any other bidder it would represent a 2.8 MHz block of very limited value for the deployment of innovative technologies whereas for Meteor successfully bidding for block C1 would allow use of the entirety of Block C, a standard sized 2 X 5 MHz block until at least 2015 and would also confer an advantage in bidding for block C2 subsequently in the proposed licence competition 3 for similar reasons. For a bidder other than Meteor to place a higher value than Meteor on block C1 would require them to have a high degree of confidence of their ability to be the successful bidder for block C2 in a future spectrum award process. In addition they would have to be undeterred by having to wait for as long as six years before obtaining full use of the entirety of block C. Vodafone would submit that as these conditions are highly unlikely to be met, particularly by the other existing licensees, Option A appears to preclude a level playing field between all the bidders in the licence award processes. This is a serious flaw in the proposed licensing option that, on its own, warrants excluding it from consideration for the allocation of spectrum in the 900 MHz band.

Vodafone believes that Option A is also sub-optimal with respect to maximising technical efficiency in the use of the spectrum. The proposed non-standard blocks of a size less than 2 X 5 MHz raise the risk of some spectrum going unallocated or being inefficiently underutilised for an extended period. It is also the case that while Option A allows the possibility of some applicants obtaining contiguous blocks of spectrum, the current proposals in no way limit aggregation risks (obtaining non-contiguous spectrum) for any bidder. This is the case because Option A, in common with the

other licensing options set out by ComReg does not specify the precise auction format to be used. Only certain types of auction format, those that allow operators to submit package bids, or that give full transparency to bidders on how other bidders are seeking to aggregate lots in a multiple round auction process (the simultaneous multiple round bidding process) effectively address aggregation risks, and ComReg has not given any assurance that these would be implemented. The problems associated with ComReg's failure to provide necessary detail on the specific auction format is further elaborated in Vodafone's response to question 17. However it is clear that Option A, as it stands, does not ensure that all the 900 MHz spectrum will be fully allocated and used efficiently, or that successful bidders will be assured of obtaining contiguous spectrum blocks at the appropriate time where that is their requirement.

Vodafone has set out in detail in the response to question 4 the substantial risks of serious disruption to existing licensees and their customers from ComReg's spectrum auction proposals where one or more of the current 900 MHz licensees failed to obtain the amount of spectrum required to maintain their current GSM services, and allow the deployment of innovative new technologies, upon the expiry of their current licences. These risks of adverse outcomes from a competitive award process are common to all three of the licensing options set out by ComReg. However Option A by limiting the range of bidding options available to bidders in any one of the three proposed licensing competitions, extending the period of uncertainty, and thereby limiting the time available for existing licensees to attempt to mitigate the effects of any loss of 900 MHz spectrum as a result of the award process, would increase the likelihood of occurrence of adverse auction outcomes and increase their impact on the market were they to occur.

Vodafone notes that key advantages of Option A set out by ComReg are that it would make available currently unused spectrum and would lead to increased competition if new entrants were to acquire spectrum. Neither of these stated advantages are unique benefits associated with the proposed use of Option A. The making available of currently unallocated spectrum in the 900 MHz band could be also be introduced by the other licensing options set out by ComReg and also by other possible licensing options not considered in the consultation document. The potential of the proposals to allow a new entrant to obtain 900 MHz spectrum rights is a result of the 2 X 10 MHz proposed spectrum cap given the 2 X 35 MHz of spectrum available in the band, which is proposed as applying to all the licensing options considered by ComReg and could also apply to alternative licensing options that have not been considered. It is Vodafone's view that there are alternative measures that would yield these benefits cited for Option A while avoiding its shortcomings as already highlighted. Vodafone sets out in the response to question 17 alternative proposals that would allow regulatory objectives to be met while effectively avoiding the substantial risks of disruption in the even of existing licensees being unsuccessful in a 900 MHz competitive award process.

Vodafone must emphasise that our views in regard to the possible use of Option A in a competitive award process scenario are without prejudice to our previously stated position that ComReg's general proposal to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act.

Q14. Do you support Option B? Please provide supporting arguments with your answer.

No. While Option B is superior to Options A and C, primarily by providing regulatory certainty to stakeholders at a relatively early stage, in common with Option A it has a number of deficiencies arising from the non-homogeneous nature of the different spectrum blocks. In addition Option B

does not ensure that all the existing licensees will be able to obtain sufficient contiguous 900 MHz spectrum upon the initial expiry date of the current licences to maintain unaffected provision of existing GSM services to customers and to support the deployment of UMTS in the band. The substantial risks and costs to operators and consumers of existing licensees being unsuccessful bidders in the proposed auction therefore also arise under Option B.

Vodafone considers that, if a competitive award process were to be used for the allocation of spectrum in the 900 MHz band, then a single licence competition would be the optimal approach to use as it would maximise regulatory certainty for industry on the future arrangements for the 900 MHz band and avoid the extended period of uncertainty that would arise if Option A were implemented. Option B, with just a single licence competition would also avoid inefficient duplication of the costs of planning for, setting up and running multiple licence competitions.

With regard to technical efficiency, while non-standard block sizes (C1 and C2 as proposed in Option A) are avoided under Option B, reducing the risk of stranded and unused blocks of spectrum, there is still inefficiency associated with the inability of an operator other than Meteor to fully and efficiently utilise Block C until 2015. The risk of a six year period of sub-optimal use of a spectrum block is a key problem with this licensing option.

It is also the case that while Option B allows the possibility of applicants obtaining contiguous blocks of spectrum, and is superior to Option A in this respect, the current proposals in no way limit aggregation risks (obtaining non-contiguous spectrum) for any bidder. This is the case because Option B, in common with the other licensing options set out by ComReg, does not specify the precise auction format to be used. Only certain types of auction format, those that allow operators to submit package bids, or that give full transparency to bidders on how other bidders are seeking to aggregate lots in a multiple round auction process (the simultaneous multiple round bidding process) effectively address aggregation risks, and ComReg has not given any assurance that these would be implemented. The problems associated with ComReg's failure to provide necessary detail on the specific auction format is further elaborated in Vodafone's response to question 17. However it is clear that Option B, as it stands, does not ensure that all the 900 MHz spectrum will be fully allocated and used efficiently, or that successful bidders will be assured of obtaining contiguous spectrum blocks at the appropriate time where that is their requirement.

The status of the proposed Block C, to part of which an existing licensee will retain usage rights until 2015, would have the effect of introducing an important asymmetry between bidders in the proposed competitive award process. The asymmetry would not be as great as under Option A as a successful bidder other than Meteor would be able to fully utilise the blocks from mid 2015 under these proposals, however it remains significant. This is not conducive to a level playing field between all the bidders in the proposed competitive licence award process and is a serious shortcoming of Option B.

Vodafone has set out in detail in the response to question 4 the substantial risks of serious disruption to existing licensees and their customers from ComReg's spectrum auction proposals where one or more of the current 900 MHz licensees failed to obtain the amount of spectrum required to maintain their current GSM services, and allow the deployment of innovative new technologies, upon the expiry of their current licences. These risks of adverse outcomes from a competitive award process also arise under Option B.

Vodafone notes that key advantages of Option B set out by ComReg are that it would make available currently unused spectrum and would lead to increased competition if new entrants were to acquire spectrum. Neither of these stated advantages are unique benefits associated with the proposed use of Option B. The making available of currently unallocated spectrum in the 900 MHz

band could be also be introduced by the other licensing options set out by ComReg and also by other possible licensing options not considered in the consultation document. The potential of the proposals to allow a new entrant to obtain 900 MHz spectrum rights is a result of the 2 X 10 MHz proposed spectrum cap given the 2 X 35 MHz of spectrum available in the band, which is proposed as applying to all the licensing options considered by ComReg and could also apply to alternative licensing options that have not been considered. It is Vodafone's view that there are alternative measures that would yield these benefits cited for Option B while avoiding its shortcomings as already highlighted. Vodafone sets out in the response to question 17 alternative proposals that would allow regulatory objectives to be met while effectively avoiding the substantial risks of disruption in the even of existing licensees being unsuccessful in a 900 MHz competitive award process.

Vodafone must emphasise that our views in regard to the possible use of Option B in a competitive award process scenario are without prejudice to our previously stated position that ComReg's general proposal to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act.

Q15. Do you support Option C? Please provide supporting arguments with your answer.

No. Vodafone strongly disagrees with ComReg's proposals to reserve up to two spectrum blocks (Blocks A and B) for new entrants in a competitive award process for new licences in the 900 MHz band.

Vodafone notes that Option C is merely a variant of Option B, but with a proposal to reserve blocks for new entrants. Option C therefore has the same flaws as licensing option B, but is inferior to it given that the additional aspects of Option C are in Vodafone's view are entirely without merit and risk creating serious distortions in the allocation of spectrum. Vodafone would also question the legal basis for the proposal to impose conditions in an auction to exclude existing licensees from bidding on specific spectrum blocks where there has been no finding of SMP or a lack of effective competition in the mobile market.

It is important that ComReg provides clarity at the outset with regard to the definition of the term 'new entrant' as used by ComReg in the context of the proposed Option C. Vodafone notes that in the 3G licence competition, 'new entrant' was defined as an operator that had no existing mobile communications operations. It is unclear whether the same definition applies here and the issue is significant given that there is an existing mobile operator, '3', that does not currently have a 900 MHz spectrum allocation but is providing mobile services using spectrum in the 2.1 GHz band and on the basis of a national roaming agreement with Vodafone. If the definition of new entrant is defined as in the 3G licence competition then this would preclude '3' from bidding and would raise concerns around discriminatory conditions in the proposed spectrum award process. ComReg must provide clarification in relation to its use of the 'new entrant' term.

The proposed 2 X 10 MHz spectrum cap per operator in a competitive award ensures that under Option B a new infrastructure based entrant would be able to obtain access to a single 2 X 5 MHz block, possibly at the minimum reserve price, and would be able to bid on equal terms with existing licensees. A proposal to reserve one block for a new entrant as under Option A does not therefore appear to represent any improvement over Option B in terms of promoting competition except that

it would allow a new entrant to obtain access to a spectrum block on artificially favourable commercial terms (given the inability of existing licensees to make bids for the block) which would confer an artificial advantage on an entity solely by virtue of being a new entrant and distort competition in the mobile market.

ComReg recognises the potential for new entrants to obtain spectrum blocks at artificially low prices as a result of its proposals. In an attempt to address this ComReg suggests that if there was one new entrant then Block A could be reserved and to ensure that a fair price was paid for that licence, the licence fee could be set as the average price of all other 900 MHz blocks awarded in the competition. Vodafone contends that this proposed solution to the problem of a new entrant paying a competitively distorting artificial low price for a spectrum block or blocks is unworkable as it would require the new entrant or entrants to make an open-ended commitment at the outset to pay an average of the prices that successful bidders would pay for the other spectrum blocks. This price could be considerably above their valuation of the spectrum and it is unlikely that a new entrant would accept a condition that would put them at risk of significantly overpaying relative to their own valuation of the spectrum licence(s). If a new entrant licensee had the option to relinquish its licence without cost if the price derived from the average of the successful bids for the other spectrum blocks exceeded its own willingness to pay then this could lead to one or two spectrum blocks going unallocated. This would be a highly unfavourable competition outcome as it would lead to very inefficient use of the 900 MHz spectrum band, with the associated high opportunity costs.

ComReg states in the footnote on page 43 of the consultation document that the previous example of determining an appropriate licence fee is presented for illustration purposes only and that full consideration would be given to auction design following the outcome of this consultation. However ComReg's inability to readily devise an effective proposal that would avoid a new entrant paying an artificially low price for the reserved spectrum block(s) indicates the lack of feasibility of Option C, and the risks of significant competitive distortions to which it would give rise. It is not clear that an alternative auction condition to address this issue can be found for Option C. Moreover Vodafone considers that it is entirely unacceptable that ComReg should present spectrum proposals where key elements of the design have not been fully developed as it prevents consultation respondents from giving comprehensive input prior to a final decision on the future arrangements for the 900 MHz band being made. Vodafone considers that these shortcomings in respect of Option C warrant that it should be withdrawn from consideration.

A proposal to reserve two blocks for a new entrant or entrants would have a serious adverse impact on the market as it would effectively guarantee that one of the existing licensees would be unable to obtain additional spectrum beyond their current allocation, and would in fact obtain at best a spectrum allocation (2 X 5 MHz) significantly reduced from their current licence for 2 X 7.2 MHz. As ComReg acknowledges in section 8.6.6 of the consultation document, this would also raise the general probability of existing licensees being unsuccessful in a spectrum award competition.

In section 8.6 of the consultation paper ComReg claims that the proposal to reserve up to two blocks for new entrants reflects the objective of promoting competition and is informed by ComReg's analysis of the potential costs and benefits that would accrue to consumers and operators and to welfare as a whole arising from an increased number of operators in the mobile market. Vodafone considers however that ComReg's analysis provides no basis for the conclusion that a proposal to reserve two blocks of spectrum for new entrants has a positive net benefit for society. Even if it is accepted that the analysis in Appendix F of the consultation paper is correct, the model does not include within its scope any consideration of whether the benefits of allocating two blocks of spectrum for new entrants exceed the costs. To justify the reservation of two blocks

for new entrants, ComReg must demonstrate that the benefits of additional entry exceed the costs of the certain loss by one existing licensee of a minimum of 2.2 MHz of their current 7.2 MHz spectrum allocation that would arise from ComReg's proposal.

No assessment is carried out in Appendix F or elsewhere in the consultation paper to prove that there is a net benefit from this variant of Option C and Vodafone considers that it is very likely that the cost of reducing an existing licensee's existing spectrum allocation would, in terms of the resulting adverse impact on its ability to provide services to existing customers, significantly outweigh any conceivable benefits. This proposal is neither objectively justified nor proportionate and must therefore in Vodafone's view be withdrawn.

Vodafone must emphasise that our views in regard to the possible use of Option C in a competitive award process scenario are without prejudice to our previously stated position that ComReg's general proposal to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act.

Q16. If you agree with Option C, do you have views on the number of blocks that should be potentially reserved for new entrants? Please provide supporting arguments with your answer.

Please see the response to question 15.

Q17. Do you believe there are other viable options that ComReg should consider? If so please explain these options in detail with supportive arguments.

Yes. Vodafone believes that there are other viable options for the allocation of spectrum in the 900 MHz band that ensure the efficient management and use of the radio spectrum, promote competition, and promote the interests of end users, while avoiding the significant risk of adverse auction outcomes and the associated potentially substantial costs and disruption arising from ComReg's current proposed spectrum licensing approaches.

Vodafone considers that the optimal approach to the allocation of spectrum in the 900 MHz band is to extend the term of the spectrum licences held by the existing licensees until at least the expiry date of the current 2100 MHz licences in 2021. Ideally the opportunity should be taken at this juncture to extend the terms of the existing licences on a flexible basis, with the amended licences being of indefinite duration but with a minimum term until 2021, and subject to revocation thereafter for well defined reasons where 5 years notice is given by ComReg.

Subject to agreement from all the existing 900 MHz licensees, the terms of the existing licences should also be further amended to increase the spectrum holdings of each existing licensee from 7.2 MHz to 10 MHz and to alter the frequencies covered under each licence. With regard to the 2 X 5 MHz blocks identified by ComReg in the spectrum options set out in section 8 of the consultation document, a possible scenario that would minimise the level of re-tuning required would involve allocating Blocks F and G to O2, Blocks D and E to Vodafone, and Blocks B and C to Meteor. The additional spectrum necessary would be acquired both through elimination of the existing guard

bands and the assignment of some of the currently unallocated spectrum in the band. Existing licensees would be required to re-tune the frequencies used by their respective networks but where agreement was obtained from all the existing licensees this process could be undertaken and completed prior to, or in the period immediately following, the current expiry dates of the existing licences.

Sufficient spectrum would remain unallocated in the 900 MHz band to leave a single 2 X 5 MHz block, perhaps equivalent to Block A of the proposed future spectrum blocks in the band set out by ComReg in its licensing proposals, available for assignment. The implementation of a 2 X 10 MHz per licensee spectrum cap, as currently proposed by ComReg, would mean that this spectrum block could be awarded in an auction in which existing licensees would not participate. If there were demand from one or more new licence applicants for this spectrum block at a reasonable set reserve price, then an operator other than the existing licensees would obtain spectrum usage rights in the 900 MHz band.

In the event that an auction process for this available spectrum block were held and no applications were received to participate in an auction for the block, which would demonstrate that the expectation of demand for this spectrum in excess of the available supply was not valid, then it would be appropriate to engage with the existing licensees with a view to amending their existing licence terms so as to allocate the entire 900 MHz band equally between them. As an auction process for Block A in the currently unallocated spectrum in the band could be initiated as early as 2009, it would be possible on foot of a failure to allocate Block A in an auction to revise the terms of existing licences on an agreed basis so as to divide the full 900 MHz band equally between the existing licensees before any steps taken on the basis of existing licensees having 10 MHz spectrum assignments were initiated.

Vodafone acknowledges that the proposed extension of the duration of existing licences without auction, and other amendments to increase the amount of spectrum usage rights allocated to existing licensees, would have implications in terms of the economic value of the existing licences. Other things equal, longer licence durations and an increase in the amount of spectrum held by existing licensees would raise the value of the spectrum, and these factors would be relevant considerations in the context of any proposed review of the annual fees for 900 MHz licences.

The spectrum allocation approach set out by Vodafone above is based on the existing licensees consenting to the proposed changes to the amount of spectrum usage rights and particular frequency rights covered by their licences. Vodafone considers that the likelihood of securing agreement across the operators to adopt this approach is very good as there are strong incentives for existing licensees to support an approach that assures them of certainty around the availability of at least their current allocation of spectrum to maintain existing services to their customers, while also providing additional spectrum to allow them to deploy UMTS in the band. Vodafone believes that this option is the optimal approach in the context of the constraints posed by the current spectrum allocation arrangements in the band.

ComReg should seek agreement from the operators on such an approach, which would better achieve regulatory objectives than the current options. This approach would also avoid the significant risks of disruption to existing mobile communications services associated with ComReg's current spectrum licensing proposals.

10 MHz Spectrum Allocations for UMTS 900 Refarming

Although Vodafone considers that the above option is the most effective approach to achieve ComReg's regulatory objectives given the limited amount of spectrum in the 900 MHz band, the presence of existing licensees offering services of major economic value, and differing initial termination dates for existing licences, it is not ideal from the perspective of facilitating the deployment by existing licensees of UMTS technology in the 900 MHz band whilst also maintaining unaffected service provision to existing GSM customers. Vodafone believes that a 2 X 10 MHz allocation of 900 MHz spectrum to each existing licensee is unlikely to be sufficient to support spectrum re-farming without the extensive deployment of spectrum optimisation techniques in operator's networks, significant migration of mobile traffic from the 2G to the 3G network, and spectrum sharing between the existing licensees. Even if these measures were adopted, a 10 MHz allocation would be the absolute minimum required for Vodafone to be able to undertake UMTS 900 refarming.

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The question of the adequacy of a 2 X 10 MHz spectrum allocation for each existing licensee would also be encountered in the case where an auction as proposed by ComReg was held and each of the existing licensees was successful in obtaining 10 MHz of spectrum. Vodafone considers that ComReg must therefore make comprehensive provisions for spectrum sharing between the operators if the potential benefits of liberalisation of use of the 900 MHz spectrum band are to be obtained by end users.

Benefits of Vodafone's Proposed Option

Vodafone believes that the alternative spectrum licensing option proposed here has considerable merit when assessed against the factors set out by ComReg in section 8.2 of the consultation document, and also against other criteria. The extension of the duration of existing licences on a fully flexible basis without an auction would maximise regulatory certainty, enabling existing operators to make efficient long term investments in mobile infrastructure and innovation with confidence and would remove any doubts about the ability of the existing licensees to continue to provide at least their current level of services to customers using 900 MHz spectrum going forward. This measure would also avoid the serious risks of disruption, and the substantial costs for the operators and end users as described in the response to question 4, if one or more of the existing licensees were to lose some or all of their current spectrum allocation where unsuccessful in an auction.

Vodafone's proposal to increase the spectrum allocated to the existing licensees and to amend the frequencies covered by these licences would allow for the efficient use of the spectrum and permit existing licensees the minimum amount of spectrum necessary to deploy UMTS technology in the 900 MHz band while maintaining existing services to GSM customers. ComReg's current auction proposals do not offer any assurance that existing operators would be able to obtain additional spectrum to refarm and thereby risk the benefits of liberalisation of use not being realised.

With respect to the promotion of competition, the allocation of a single 2 X 5 MHz block of currently unallocated spectrum in the 900 MHz band will allow a new market entrant to obtain 900 MHz spectrum if demand from prospective licence applicants is present, satisfying this objective. In the event that an award process for this unallocated block fails, Vodafone's proposal to allocate the band equally between the existing licensees would ensure that this spectrum could be fully and efficiently utilised for the benefit of end users.

Auction Based Options

Without prejudice to our view, as set out in the response to question 4, that ComReg's proposals to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives under the 2002 Communications Regulation Act, if ComReg nonetheless still determines that all the spectrum in the 900 MHz band must be auctioned then this approach should at least be carried out in a manner which minimises the risks of disruption and maximises the prospects for an efficient auction outcome.

As set out in the response to question 14, Option B is the least flawed of the auction based approaches considered by ComReg. Vodafone considers that holding a single licence competition for the award of spectrum would at least provide certainty about the future arrangements for the entire band at an early stage, following the conclusion of the award process in 2009. This avoids the extended uncertainty and risk of distortions posed by holding three separate licence competition as proposed by Option A.

As option B allows seven full 5 MHz blocks to be ultimately allocated for use in this band, the risk of unusable portions of spectrum posed by Option A is minimised and the potential for each of the existing licensees to obtain contiguous 10 MHz blocks is maximised. Option B is therefore superior to Option A in terms of ensuring the efficient management and use of the radio spectrum.

Vodafone considers that Option B is also superior to the other two options analysed by ComReg in relation to the promotion of competition. As set out in the response to question 15, Vodafone strongly opposes the proposal in Option C to reserve one or more spectrum blocks for new entrants as it risks distorting the market and is contrary to the regulatory objective of ensuring the efficient use of spectrum. As Option B would allow prospective new entrants to compete on an equal basis to existing licensees in a spectrum auction, and given that the proposed spectrum cap of 2 X 10 MHz per licence applicant facilitates at least one operator in addition to the current licensees to obtain a 2 X 5 MHz block of spectrum in the band, Option C does nothing more than allow a new entrant to obtain spectrum at a sub-commercial price, distorting competition in the communications market.

Whilst Option B as set out by ComReg is preferable to Options A and C in terms of satisfying statutory regulatory objectives, it does not address the considerable risks of disruption, and the resulting substantial costs for existing operators and consumers, in the event that existing licensees were to be unsuccessful in an auction for spectrum in the 900 MHz band. Vodafone believes that this major shortcoming of Option B could be partially mitigated only by significantly amending the proposed approach so as to guarantee each existing licensee at least one 2 X 5 MHz block for the continued provision of their existing services to customer in advance of any spectrum award process. This would at least prevent the most disruptive outcome of one or more existing licensees failing to obtain any spectrum in the 900 MHz band. Vodafone considers that such a guarantee would be objectively justified and proportionate based on the substantial value of the communications services provided by existing licensees to customers in this band and the need to minimise the impact of disruption from adverse auction outcomes. Even an Option B amended as proposed would not however prevent the risks of significant disruption to existing services or the possibility of at least one existing licensee failing to obtain sufficient spectrum to implement UMTS 900 refarming.

Optimal Auction Format

ComReg has not set out in the consultation document any proposals on the particular auction format that would be used in a licence competition for the 900 MHz band. This is an important omission given that any assessment of the licensing options proposed by ComReg in terms of the extent to which they promote the efficient use of the spectrum is necessarily incomplete in the absence of details on the precise spectrum award format to be used.

It is clear for example that auction formats involving 'package' bidding mechanisms, such as combinatorial auctions, are optimal if it is a relevant objective to guarantee successful bidders contiguous blocks of spectrum. As ComReg has highlighted in section 8.2.1.1 of the consultation paper the desirability of operators having access to contiguous licence blocks from a spectrum efficiency viewpoint, a decision in favour of a combinatorial auction as part of ComReg's three licensing proposals would have been appropriate. Many auction formats do not eliminate the risks of successful competition bidders obtaining non-contiguous spectrum, but as ComReg has not specified that an auction format with a package bidding mechanism would be used, aggregation risks for bidders cannot be ruled out under ComReg's current auction options. Vodafone considers that ComReg should therefore have set out a clear position on the proposed auction format as part of the licensing options set out in the consultation document.

Vodafone believes that the primary objective that must be met by any auction format proposed for the award of spectrum in the 900 MHz band is to ensure the efficient use of the spectrum. This requires that:

1. The spectrum auctioned is allocated to those users that value it most highly and;

2. Successful bidders are guaranteed contiguous spectrum blocks where this is their preference.

Only a limited number of the possible auction mechanisms available satisfy these two requirements. A first price sealed bid auction format involves substantial risks that the first requirement would not be achieved. In a first-price sealed bid auction, the optimal level of a bid depends not only on value that a bidder places on spectrum, but also on the expected level of competition. By providing no information about participation it is entirely possible that under this auction approach a bidder that places a high valuation on the spectrum could be outbid by a bidder with a lower valuation, simply because the second bidder expects more competition. The strategic complexity of licence applicants making bidding decisions without relevant information produces a substantial risk of bidding errors and an economically inefficient auction outcome. If a first price sealed bid format did not feature package bidding mechanisms this would mean that aggregation risk would also be present, raising the possibility of auction outcomes with stranded blocks or non-contiguous spectrum. For these reasons Vodafone contends that a first price sealed bid approach should not be considered for any proposed spectrum award process in the 900 MHz band.

Vodafone considers that a simultaneous multiple round ascending auction with package bidding features, or a sealed bid combinatorial auction with a second price rule (such as that used by ComReg in the recent award process for block licences in the 26 GHz band) are the optimal auction format options in terms of achieving the two key requirements for the spectrum award process set out above.

On balance Vodafone considers that the simultaneous multiple round ascending auction format is the best approach to use in a proposed spectrum award process for the spectrum in the 900 MHz band. This format offers considerable benefits in terms of transparency as it would allow bidders to

see how other licence applicants would be aggregating lots over the auction rounds and would also provide information to address issues of common value uncertainty. Any bidder asymmetry concerns could be addressed by measures such as anonymising bidder identities. Vodafone considers that this approach would maximise the prospects for an efficient auction outcome and should therefore be implemented if ComReg determines that an auction for all the spectrum in the 900 Mhz band is to be held.

Reserve Price

It may be appropriate to set a reserve price for blocks in a spectrum award process for the band, however this price should be set at a reasonable level that does not risk choking off demand for spectrum and leading to an inefficient auction outcome, for example with one or more spectrum blocks going unallocated at the end of the award process. This would be entirely unacceptable given the very high opportunity costs of unused spectrum in this band. Very careful consideration should therefore be given by ComReg to the level of any reserve price for spectrum blocks as part of a proposed 900 MHz spectrum award process.

Further Consultation

ComReg's current proposals for the allocation of spectrum in the 900 MHz band by auction do not provide any information on essential issues such as the specific auction format and the proposed reserve price. Vodafone expects that if, despite the arguments in this submission demonstrating that ComReg's proposals to auction new licences for all the spectrum in the 900 MHz band are unjustified, disproportionate, unnecessary, and contrary to ComReg's regulatory objectives, ComReg still determines that all the spectrum in the 900 MHz band must be auctioned then the necessary further proposals on the auction format to be used will be formally consulted upon by ComReg at a later stage so that all interested parties, including Vodafone, will have the opportunity to provide their views prior to a final decision.

Q18. Do you agree with ComReg's assessment that there is insufficient demand for 1800 MHz spectrum assignments to warrant holding a competitive award process at this time? Please provide supporting arguments with your answer.

No. The 1800 MHz band is an excellent candidate for the deployment of innovative wireless technologies such as LTE and Vodafone considers that there is likely to be sufficient demand for the currently unallocated spectrum in this band to justify the holding of an award process to assign it in the near term.

A number of spectrum bands are currently being considered for the harmonised deployment of LTE across Europe – the Digital Dividend spectrum in the UHF band, the 2.6 GHz band, and the 1800 MHz band. In the context where spectrum in the 2.6 GHz band will not be available for utilisation for the deployment of innovative communications technologies in the short to medium term given the current allocation of the spectrum to MMDS until 2014, and where the future arrangements for the Digital Dividend spectrum are unclear, the unallocated spectrum in the 1800 MHz band is the principal spectrum that can be made immediately available for the early deployment of LTE. As it appears very likely that most European countries will see deployment of LTE in the 2.6 GHz band much earlier than will be possible in Ireland, this only reinforces the case

for making the currently unallocated spectrum in the 1800 MHz band available for assignment in a timely manner.

Facilitating the earliest possible deployment of LTE would yield considerable benefits for end users as this technology represents a major step change in terms of the broadband services that it will enable operators to provide. The early roll-out of LTE in the 1800 MHz band would allow operators to offer broadband products with far higher data download and upload speeds than are currently available, or that would be possible even where the 900 MHz band is re-farmed for UMTS. Vodafone considers that it is therefore imperative that an award process only for the currently unallocated spectrum in this band, option (a) as set out by ComReg in section 9.2 of the consultation document, is held at an early stage.

As previously outlined, Vodafone is fundamentally opposed to the auction of the entirety of the 900 MHz band as currently proposed by ComReg, however Vodafone would not be opposed to the competitive allocation of a single 2 X 5 MHz block from the currently unallocated spectrum in the 900 MHz band and believes that it would be desirable if a spectrum award process for the unallocated spectrum in the 1800 MHz band were held either simultaneously with, or close to the time that a 900 MHz spectrum award process occurred. In any event an award process for the unallocated 2 X 26.4 MHz of spectrum in the 1800 MHz band should, in Vodafone's view, be held not later than 2011 with the spectrum awarded being made immediately available to the successful licence applicants.

Vodafone considers that it is vital that ComReg adopts a holistic approach to the allocation of spectrum in the 900 MHz, 1800 MHz, and Digital Dividend spectrum bands that takes account of the fact that the valuation of these different spectrum bands, that can substitute for one another to varying degrees, is interrelated. It is also of central importance that regulatory certainty is provided to market players at the earliest possible stage about the spectrum that is actually available to them to provide existing and new services into the future. Providing a high degree of regulatory certainty to the market will give operators a solid basis on which to undertake substantial long term investments in infrastructure and is consistent with ComReg's regulatory objective of promoting competition by facilitating efficient investment. This objective can be achieved by holding spectrum award processes for these spectrum bands at the earliest practical opportunity, and ideally holding these award processes simultaneously, or as close together in time as is feasible.

As the valuation that a licence applicant places on any given amount of spectrum to be allocated in a particular spectrum band will clearly be influenced not only by their expectations about the availability of alternative spectrum but also by the terms on which alternative spectrum would be made available, it would also be optimal where a significant delay in time occurs between the award processes for the different spectrum bands that the terms on which later spectrum bands are to be allocated is made transparent to prospective licence applicants at the time that the earlier spectrum award process occurs.

ComReg now has a valuable opportunity to provide a high degree of regulatory certainty to the market by setting out clear plans for the future arrangements in the 900 MHz and 1800 MHz bands. Vodafone believes that an auction for the currently unallocated spectrum in the 1800 MHz band should be held at an early stage, as previously outlined, and simultaneously with or close to the time that any separate spectrum award process for the unallocated spectrum in the 900 MHz band is held. It would also be optimal if a high degree of clarity was provided by ComReg on the plans for the Digital Dividend spectrum and the terms on which this spectrum would be allocated.

Vodafone does not agree with the spectrum assignment option of holding a competition for *all* spectrum in the 1800 MHz band as cited by ComReg in section 9.2 of the consultation document.

A comprehensive analysis of the impact of such a proposed approach to the 1800 MHz band has not been conducted and Vodafone considers that an auction for new licences for the entirety of the spectrum in the 1800 MHz band in the circumstances where existing licensees have made substantial long term network investments, where these licensees are currently providing communications services of enormous economic value using this spectrum, and where there is unallocated spectrum available in the band to meet demand from prospective licence applicants, is clearly inefficient and thus contrary to ComReg's regulatory objectives. Vodafone considers that any systematic analysis would conclude that the potential costs of implementation of this option would far exceed any benefits.

Vodafone believes that there is a strong case on public policy grounds for the extension of the duration of the existing 1800 MHz licences held by existing licensees in this band, at a minimum until the end date of the current 3G licences in 2021. Vodafone notes in particular that if there is no certainty for existing licensees regarding the continued availability of spectrum in the 1800 MHz band beyond 2015 then the very limited potential for the existing mobile operators to use alternative spectrum to provide services in the event of being unsuccessful in the proposed 900 MHz auction would be seriously undermined.

Optimal Auction Format

Vodafone's position on the optimal auction format is similar to that set out in regard to the 900 MHz band in the response to question 17. We believe that a simultaneous multiple round auction process with mechanisms allowing bidding for packages of contiguous blocks would be the best approach to use for the assignment of the currently unallocated spectrum in the 1800 MHz band as it maximises the probability of achieving an efficient auction outcome.

Q19. Do you agree that the holding of a spectrum award process for 1800 MHz spectrum circa 2013 would be appropriate? Please provide supporting arguments with your answer.

No. As set out in the response to question 18 Vodafone considers that a spectrum award process solely for the currently unassigned spectrum in the 1800 MHz band should be held in the short term, and in any event no later than 2011. This spectrum should be made available for use immediately upon award to the successful licence applicants.

Q20. Do you agree with ComReg's proposal that the minimum spectrum block size should be 2 X 5 MHz for future 1800 MHz spectrum assignments? Please provide supporting arguments with your answer and suggest a detailed alternative if applicable.

Vodafone believes that a minimum spectrum block size of 2 X 10 MHz for a future 1800 MHz spectrum award process would be optimal as this spectrum block size is in our view the minimum necessary for the effective deployment of LTE. If, contrary to Vodafone's view, ComReg concludes that a 2 X 5 MHz spectrum block size should be used for future 1800 MHz spectrum assignments then it would be appropriate that the award format facilitates applicants in obtaining contiguous blocks of spectrum where they wish to do so. In an auction format this would require a bidding

process that would allow licensees to submit sets of package bids for combinations of frequency specific contiguous spectrum blocks up to the maximum spectrum cap (2 X 10 MHz at a minimum). Ensuring access by successful licence applicants to contiguous spectrum blocks, where they require this, should maximise the efficiency with which wideband technologies can be deployed, will avoid the risk of allocating stranded blocks of limited value, and will minimise the requirement for guard bands.

Irrespective of the minimum spectrum block size proposed, as set out in the response to question 18, Vodafone considers that an award process for the currently unallocated spectrum in this band only, option (a) as set out by ComReg in section 9.2 of the consultation document, is held at an early stage. Vodafone must reiterate that we do not agree with the proposed spectrum assignment option (b) of holding a competition for *all* spectrum in the 1800 MHz band as cited by ComReg in section 9.2 of the consultation document. A comprehensive analysis of the impact of such a proposed approach to the 1800 MHz band has not been conducted and Vodafone considers that an auction for new licences for the entirety of the spectrum in the 1800 MHz band in the circumstances where existing licensees have made substantial long term network investments, where these licensees are currently providing communications services of enormous economic value using this spectrum, and where there is unallocated spectrum available in the band to meet demand from prospective licence applicants, is clearly inefficient and thus contrary to ComReg's regulatory objectives. Vodafone considers that any systematic analysis would conclude that the potential costs of implementation of this option would far exceed any benefits.

Vodafone believes that there is a strong case on public policy grounds for the extension of the duration of the existing 1800 MHz licences held by existing licensees in this band, at a minimum until the end date of the current 3G licences in 2021. Vodafone notes in particular that if there is no certainty for existing licensees regarding the continued availability of spectrum in the 1800 MHz band beyond 2015 then the very limited potential for the existing mobile operators to use alternative spectrum to provide services in the event of being unsuccessful in the proposed 900 MHz auction would be seriously undermined.

12 March 2009

Mr. John Doherty
Chairperson
Commission for Communications Regulation
Irish Life Centre
Lower Abbey Street
Dublin 1,

Dear John,

RE: ComReg Consultation Paper on Liberalising the Use of the 900 MHz and 1800 MHz Spectrum Bands

I am writing to you regarding ComReg's recently published consultation paper on liberalising the use of spectrum in the 900 MHz and 1800 MHz spectrum bands (ComReg Document 08/57).

Vodafone welcomes the opportunity to participate in the current consultation on ComReg's spectrum licensing proposals and we will be providing our comprehensive submission to ComReg in due course.

Having reviewed and considered your proposals in detail, there are a number of aspects of your current proposals that are of concern to us. It is in this context that we believe it is appropriate that we write to you separately at this time.

1. 3G Licence

Vodafone is very surprised by the absence of any proposal in the consultation document for the extension, on a demonstrable need basis, of the duration of the existing spectrum licences held by the mobile operators in the 900 MHz band until the end date of their respective 3G licences in the 2.1 GHz band. A spectrum licensing approach for the 900 MHz band that does not incorporate a provision for extension of existing licences is entirely inconsistent with the definitive statement made by ComReg's predecessor, the ODTR, in its 2001 Information Memorandum on the original tender for licences to provide 3G services. In particular:

Section 4.2 of ComReg's 3G Licence Tender Information Memorandum (Document No. ODTR 01/96) states that:"Continued availability of existing spectrum assignments in the 900 MHz and 1800 MHz bands to mobile telecommunications licensees will be reviewed three years prior to licence expiry. Retention of such spectrum will be on a demonstrable need basis until the end date of the 3G licences." [Vodafone's emphasis]

The three licensing options considered by ComReg in its current consultation document do not however feature any provision to extend the retention by the mobile operators of their existing 900 MHz licences beyond their current termination dates. Moreover there is no explicit consideration whatever of the option of extending the duration of licences held by the existing licensees in the 900 MHz band in the consultation paper although it is clear that there is a pressing requirement for existing operators to retain access to this spectrum for the efficient provision of communications services to their customers.

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Vodafone's 2002 bid for a 3G licence, and all planning thereafter, relied on the above statement in the 3G Licence Information Memorandum in good faith. Vodafone's 3G licence bid was developed on the basis of being able to operate an integrated 2G/3G network to provide mobile communications services to our customers, using a combination of current GSM spectrum and 3G spectrum, until the termination date of the 3G licence. This is clear from the text of Vodafone's 3G licence bid application document.

In section 4-4-2, of Vodafone's 3G 'B' licence bid document it is stated that: *"Our spectrum management approach to using frequency, efficiently covers GSM 900 MHz and 1800 MHz and 3G spectrum. We will use all three frequency bands to ensure that customers have access to least cost, high quality and seamless services."* The graph of forecast number of 2G base stations, Exhibit 21 on page 6-9, shows that Vodafone clearly indicated to ComReg at that stage the requirement in our plan for approximately 1,000 GSM 900 base stations in 2012 to meet traffic requirements and demonstrates that Vodafone assumed the continued availability of spectrum in the 900 MHz band after initial 900 MHz licence expiry in 2011. As stated on p 6-1 of the licence bid document, the financials detailed in the bid also related to our business as a whole, including 2G, 2.5G, and 3G networks, consistent with the requirement set down in the ComReg tender document.

In addition the site roll-out plan in section 4-1-2 and the radio network design plan in section 4-3-2 contain several references to Vodafone's intent to use both 3G spectrum and the current spectrum assignments in the 900 MHz and 1800 MHz bands to meet coverage and data service provision targets over the duration of the 3G licence term.

Vodafone considers that ComReg's current proposals represent a totally unjustified and fundamental reversal of the stated policy on the 900 MHz and 1800 MHz licence review contained in the 2001 3G Licence Information Memorandum. A final decision by ComReg not to allow the extension of existing 900 MHz licences would run entirely contrary to what existing licensees had, to this point, legitimately understood to be the conditions governing any future spectrum assignment in this band. Vodafone made it clear in its bid for a 3G Licence that it relied on GSM 900Mhz and 1800 Mhz beyond their expiry in 2011. Comreg were aware of this and awarded Vodafone a Licence on this basis.

It is important that the Industry have confidence in the reliability and credibility of statements by ComReg regarding the terms governing future spectrum licensing processes. Without this there would be enormous regulatory uncertainty and reduced confidence in the market.

2. Digital Dividend and GSM 1800MHZ Spectrum

Vodafone considers that the damaging effect of the current spectrum licensing proposals on regulatory certainty is aggravated by the current lack of clarity around ComReg's plans for the GSM 1800MHz and for the future allocation of the Digital Dividend spectrum. Uncertainty around the timing and conditions of release of UHF spectrum for mobile use or indeed ComReg's intentions for GSM 1800MHz undermines the ability of mobile operators to make efficient investment decisions. It is not possible for any organisation to make sound commercial and technical decisions on Comreg's proposals for GSM 900MHZ .while this uncertainty exits.

3. Market Disruption

ComReg's consulation does not give any consideration to the substantial costs that would be incurred by existing 900 MHz licensees, and the likely disruption to their customers, in attempting to use their remaining spectrum resources to provide communications services in a situation where they were unsuccessful in an auction. These costs would include the major financial outlays required to build out a network based solely on the use of 1800 MHz and 2.1 GHz spectrum. There would also be reductions in the coverage and capacity of the network for extended periods that would adversely impact consumers Furthermore there would be significant opportunity costs in terms of deferral of launch of innovative new products given the necessary dedication of managerial and financial resources in overcoming the difficulties of merely maintaining adequate provision of existing services. These potential costs would far outweigh any benefits that would result from the current proposed auction based options.

ComReg's current proposals create substantial regulatory uncertainty. Such uncertainty will have far-reaching adverse consequences for competition and innovation because uncertainty in the market seriously inhibits future investment. Furthermore there would also be a negative impact in the near term as Vodafone would be compelled to freeze investment in the period prior to an auction given that there could be no certainty that existing assets would be usable if the auction were lost.

Vodafone firmly believes that it is highly unlikely that existing 900 MHz licensees would be able to negotiate interim MVNO agreements to limit the impact of disruption to their customers where their bids in an auction were unsuccessful, as mentioned by ComReg in section 8.2.1.2 of the consultation document. In Section 7.3.3 of the consultation document, ComReg proposes to incorporate licence conditions requiring the provision of MVNO hosting services in any licences issued following liberalisation. Vodafone would query the justification for and legal basis on which ComReg proposes to impose MVNO access conditions in licences without a finding of SMP following market analysis under the European Regulatory Framework. There is no assurance that MVNO agreements could be concluded by unsuccessful bidders for the 900 MHz spectrum with parties awarded new spectrum licences in the band or that these parties would have the significant network coverage and capacity required to support the customer base of current licensees. Customers of Vodafone would remain exposed to the risk of serious disruption in the event that Vodafone were to be unsuccessful in an auction.

4. Spectrum Refarming

Vodafone believes that the current proposed cap of 2 x 10 MHz on the spectrum that can be allocated to an individual operator is insufficient to support spectrum re-farming. As part of the Trial Licence obtained by Vodafone in March 2008 for the purpose of trialling UMTS900 and conducting a refarming analysis, Vodafone engaged Ericsson LMI to perform an in depth frequency planning analysis in the Donegal area. The objective was to attempt to utilise Vodafone's existing 900MHz spectrum allocation for UMTS900, reducing the spectrum allocated to GSM from 7.2MHz to 2.2MHz to free up 5MHz for UMTS 900. The finding of this analysis to date is that it is extremely difficult, even in areas of low population and traffic density, to reduce the number of channels devoted to GSM to this level without a major customer impact. Based on this evidence, it is Vodafone's opinion that ComReg must reconsider and amend its current proposals on the maximum spectrum that can be awarded.

5. [Confidential]

6. Precedents in other European Countries

Vodafone believes that it is necessary that ComReg revisit its position. In particular, Vodafone believes that ComReg must adopt an approach incorporating the extension of existing 900 MHz licences that allows for the fulfillment of public policy objectives. It is notable that in other EU countries where the issue of the optimal policy towards the expiration of existing 900 MHz licences has already arisen (including France, Germany, Portugal, and the Netherlands) the decision has been to extend the duration of the licences of the existing operators. The decisions in these countries have not contradicted the public policy objectives of ensuring the efficient management and use of the radio spectrum, and promoting competition in the market. A decision to extend the duration of the 900 MHz licences of the existing operators in Ireland until the end dates of the 2.1 GHz licences would similarly not only be entirely consistent with the achievement of these regulatory objectives but would be superior in all respects to the current proposals contained in ComReg's consultation document.

Conclusion

Vodafone urges ComReg to adhere to its undertaking in section 4.2 of the 3G Licence Information Memorandum by reviewing the existing spectrum assignments of mobile licensees in the 900 MHz and 1800 MHz bands on the basis of extending these licences on a demonstrable need basis.

We consider that it is imperative that existing licences are extended to enable the continued efficient provision of 2G and 3G mobile communications services to customers. Vodafone believes ComReg must at a minimum re-issue the consultation with the appropriate amendments to address the very serious issues raised.

Vodafone trusts that ComReg will respond to the concerns raised in this letter regarding the proposed approach to the licensing of spectrum in the 900 MHz and 1800 MHz bands. However given the importance of the issue of the future arrangements for 900 MHz and 1800 MHz spectrum licensing for our business, Vodafone reserves the right to use all available avenues to defend its commercial interests.

Yours sincerely

Gerry Fahy

Strategy Director