Commission for
Communications Regulation

Submissions to Consultation

800 MHz, 900 Mhz & 1800 MHz spectrum release

Submissions received from respondents

Document No:	**10/103**
Date:	**8 December 2010**

Consultation:	**10/71**

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Note: ComReg received a submission from Hutchison 3G Ireland to ComReg consultation 10/71, and will publish this submission in due course.

1 Digiweb

Q. 1 ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg "s proposal? Please provide reasons for your view.

Digiweb Response: Digiweb agrees with ComReg's proposal as it is following the EC's 800 MHz decision – and therefore facilitating the emergence of EU-wide economies of scale in the band. Given the size of our market, it is absolutely critical to harmonize our spectrum allocation across Europe.

Q. 2 ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg "s proposal? Please provide reasons for your view.

Digiweb Response: Digiweb agrees with ComReg's proposal. As stated earlier, any attempt to harmonize the spectrum allocation of the band 800 MHz at EU level should be strongly supported.

Q. 3 Do you agree with ComReg "s proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Digiweb Response: Digiweb favours this option. A Joint award should give in principles the best chance for new entrants to access the market. Also, the similarities of the 800 and 900 MHz cannot be denied.

Q. 4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Digiweb Response: The extra delay involved (24-30 months) would not be acceptable; that is the main reason why Digiweb would not recommend the inclusion of the 1800 MHz in the auction process. However, we believe the 2.3 GHz spectrum could be included in the auction. This would not generate extra delays (it is our understanding that the band is readily available) and this "spectrum auction bundling" could enhance the prospects for new entrants.

Q. 5 Do you agree with ComReg "s Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

Digiweb Response: Yes – Digiweb agrees with the principles and believe the conditions to be fair. Using this method, 800/900 MHz spectrum will be opened to the market with the same timing conditions, and restrain the potential advantages given to the existing 900 MHz holders.

Q. 6 Do you agree with ComReg "s proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

Digiweb Response: While Digiweb welcomes ComReg's reflection on the matter, we believe that this method doesn't take enough account of the profitability of the band. One could assume easily that most MNOs have by now fully amortized their investment – and therefore represent strong cash-generative activities. Alternative routes could be considered such as the introduction of an 'Interim Tax' which would generate an additional stream for Rural Broadband Funding.

Q. 7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg "s statutory functions, objectives and duties.

Digiweb Response: One possibility would be to compute the profitability of the 900 MHz to date (using IRR method for example) – and compare this rate with the forecast for the interim period – which will not include similar set-up cost. The difference of profitability should be considered as the potential 'Interim Tax' to be applied. However, Digiweb acknowledges that the data might not be easily obtainable.

Q. 8. Do you agree with ComReg "s proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

Digiweb Response: Yes – this is an acceptable and widespread practice that Digiweb is not objecting. This should go toward the improvement of the likelihood to see a new entrant entering the market.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

Digiweb Response: Digiweb strongly disagrees with that proposal. By setting up a cap of 2 x 20 MHz, Comreg is creating the risk of seeing no new competition emerging from the auction (In theory, the four existing MNOs could block new comers). ComReg could possibly take a more holistic view – setting up a global spectrum holding cap across the bands 800, 900, 1,800 and 2,100 MHz, and therefore promoting competition and limiting 'MHz dominance'. ComReg could also consider reserving a part of the spectrum for new entrants just as has been done recently in France (2.1 GHz) or Netherlands (2.6 GHz)..

Q. 10. Do you agree with ComReg "s proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Digiweb Response: Digiweb agrees with ComReg's proposal.

Q. 11. Do you agree with ComReg "s proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view.

Digiweb Response: While the setting of two temporal lots for the 900 MHz band is fully understandable; Digiweb does not believe that policy should necessarily be replicated for the 800 MHz band.

Q. 12. Do you agree with ComReg "s proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

Digiweb Response: Digiweb agrees with ComReg's proposal.

Q. 13. Do you agree with ComReg "s proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

Digiweb Response: Digiweb disagrees with ComReg's proposal. We estimate that ComReg shouldn't have to set such a high minimum. €5m should be far enough to discourage 'frivolous players'. We don't understand how the potential tacit agreement will be neutralized by increasing the minimum price by 'just' €8m.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

Digiweb Response: No comment.

Q. 15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market.
Do you agree with ComReg "s proposed coverage and roll-out obligation? Please provide reasons for your view.

Digiweb Response: Yes – Digiweb believe those conditions to be acceptable. Covering 70% of the population may appear high but the exceptional penetration quality of the 800 MHz band should allow for this condition to be reached.

Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.
Do you agree with ComReg "s proposed quality of service obligations? Please provide reasons for your view.

Digiweb Response: Digiweb believes that some QoS requirement such as the one related to billing presentation are not specific to the Wireless telecommunications market – and therefore shouldn't be included in a spectrum licence. A more sensible approach would be to require all authorized telecommunication providers to follow those guidelines.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.
Do you agree with ComReg "s proposed miscellaneous obligations? Please provide reasons for your view.

Digiweb Response: No Comment.

Q. 18: Do you agree with ComReg "s proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

Digiweb Response: Digiweb fully agrees with ComReg's proposal. This approach should set the 900 and 800 MHz spectrum under the same foothold, and will also protect the existing MNOs and GSM end-users.

Q.19: Do you agree with ComReg "s proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

Digiweb Response: No Objections.

Q. 20: Do you agree with ComReg "s proposal to issue „preparatory licences " to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Digiweb Response: No Objections.

2 Eircom Group

eircom Group

Non-Confidential Response to ComReg Consultation Paper
800 MHz, 900 MHz &1800 MHz spectrum release

ComReg Document 10/71

29 October 2010

DOCUMENT CONTROL

Document name	eircom Group response to ComReg Consultation Paper 10/71
Document Owner	eircom Group
Last updated	*29/10/2010*
Status	Final

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Accordingly, you are requested to contact a member of eircom Group's Regulatory Operations where there is a request by any party to have access to records which may contain any of the information herein, and not to furnish any information before eircom/meteor has had an opportunity to consider the matter.

The comments submitted to this consultation are those of Meteor Mobile Communications Ltd. (MMC Ltd.) and eircom Ltd. References to previous response submissions are to those submitted by MMC Ltd.

EXECUTIVE SUMMARY

- The eircom Group acknowledges ComReg's desire to consider a wider approach to the future licensing and release of sub 1GHz spectrum (the 800MHz and 900MHz bands) as a welcome step towards placing future spectrum access within a broad strategy framework that will truly address the needs of a digital Ireland.

- A well conceived, integrated approach towards all relevant bands represents a strategic opportunity for greater consumer and competition benefits, and the potential to deliver significant benefit towards achievement of the Government's objectives to further develop the smart economy. For a holistic approach to be truly effective, however, it must be extended to encompass relevant bands above 1GHz (primarily the future licensing and release of the 1800MHz and 2600MHz bands).

- Of particular concern is ComReg's omission to accept the valid concerns of existing licensees regarding the inherent risk and uncertainty to ongoing operations arising from a full band auction in the 900MHz band. These issues are also pertinent to the 1800MHz band.

- In addition, when considering the assignment of 800 MHz spectrum along with the opportunity that this offers, Ireland possess a unique opportunity to ensure that the country can be economically served through the provision of next generation wireless broadband. This opportunity in itself should act as a catalyst to stimulate the achievement of the nation's goals through the best use of the digital dividend. This interest will be embraced by all stakeholders: the Department of Communications, Energy and Natural Resources; the Department of Finance; the Department of Enterprise; local councils, rural communities and the telecommunications industry in general.

- While eircom has expressed a long held view that 800 and 900 MHz spectrum should be jointly offered, we have a belief, based on a thorough review, on how to best complement the goals of digital Ireland. Two important factors must be taken into consideration. The first of which is the EU's Digital Agenda, which expects that, by 2020, all Europeans have access to much higher internet speeds of above 30 Mbps and 50% or more of European households subscribe to internet connections of above 100 Mbps. The second of which is Ireland's challenging rural population demographic. To achieve the first, Ireland must consider innovative ways to achieve the second. There may be very limited options to best serve this market.

- The current consultation advances the debate in respect of some, but not all of the matters raised in the previous consultation (ComReg 09/99). Consequently it is not clear that ComReg has fully considered the eircom's Group's position as set out in our response to that consultation on all relevant matters. It is assumed that ComReg will respond to both consultations in a combined manner to provide necessary clarity.

- eircom remains of the formally stated view that a mediated solution is required in order to promote continuity of existing services to the benefit of consumers and competition in the market. We do not believe that the particular circumstances of existing licensees can be ignored. Combined consideration of the 800MHz and 900MHz greatly increases the supply of sub 1GHz spectrum and as such provides greater scope for a balance to be struck between facilitating continuity of service for existing licensees and facilitating market entry. We urge ComReg to reconsider its views.

- eircom agrees that unallocated spectrum should be awarded through an open and transparent process and that all bands should be liberalised simultaneously in 2013. The proposed combinatorial clock auction is superior to the design proposed in ComReg 09/99 and addresses concerns that arose in respect of strategic bidding incentives.

- However eircom remains concerned that the proposed reserve prices are excessive and may negatively impact on the efficiency of the award process. Best practice auction design and the well known negative economic outlook strongly indicate that a more conservative approach is required.

- New licences must be technologically neutral to promote flexibility, spectral efficiency and to facilitate innovation in this dynamic sector and should contain provisions in respect of spectrum trading, pooling and spectrum sharing.

- There are a range of aspects that require further consideration and eircom looks forward to ongoing participation. eircom agrees it is appropriate that interim licences are issued while these important issues are progressed to resolution.

INTRODUCTION

The eircom Group welcomes ComReg's willingness to consider a holistic approach to the future licensing and release of sub 1GHz spectrum (the 800MHz and 900MHz bands) following clarification of the national strategy towards terrestrial digital television over the summer.

A combined strategic approach towards all relevant bands presents an opportunity for greater consumer and competition benefits and the potential to deliver significant benefit towards achievement of the Government's objectives to further develop the smart economy. However, for a holistic approach and review of access to be truly effective, it must be extended to encompass relevant bands above 1GHz (primarily the future licensing and release of the 1800MHz and 2600MHz bands).

Ultimately, the success of Ireland's future communication offerings will depend on innovative concepts, architectural technology innovations, and efficient utilization of spectral resources. What is clear is that substantially more bandwidth will be required as wireless technologies and services get more sophisticated. The time is right, therefore, for Ireland to innovate in this area and explore the opportunity to better meet the bandwidth and speeds of the future. This, eircom believes, can be achieved by enabling structures and frameworks that allow operators to take full advantage of spectrum in the future.

The Government's own Smart Economy agenda is driving the need for both creativity in and innovative uses of our national resources. This agenda should extend to the use of radio spectrum and should act as a driving force behind any new access models developed. An integral element contributing to the realisation of this smart economy and closing of the digital divide in Ireland will be spectrum released through the digital dividend. The release of a large quantity of clean, wide area coverage spectrum is a once in a generation opportunity to bring next generation broadband to rural Ireland. It is for this reason that eircom would seek the regulator to think about the detailed methods and processes that we put in place now that will determine access and ultimately service provision for the foreseeable future.

800MHz and 900MHz spectrum is relatively limited and essential in decreasing the digital divide in Ireland. 94% of the Irish landmass is thinly populated and houses only 42% of the population. The proposed structure of spectrum allocation within ComReg's current consultation offers an opportunity for operators to bid for chunks of spectrum, however, it should be noted that will only allow 1 operator at most to obtain a spectrum allocation that allows for the full potential and most spectrally efficient deployment of LTE. eircom would suggest, therefore, that ComReg, in cooperation with the operators at this juncture, considers a mechanism for improving the overall usage of that spectrum in Ireland.

With the relative constraints that exist, spectrum pooling, sharing and trading should be considered as tools to improve the spectral efficiency, as such tools could enable new entrants and provide a mechanism by which spectrum at any given point in time can be allocated to its highest value use. Spectrum pooling, trading and sharing should be considered as tools to improve spectral efficiency, peak speeds and better coverage. Trading would enable white spots to be used more efficiently, it could enable new entrants and provides a mechanism by which spectrum at any given

point in time can be allocated to its highest value use. Potentially all bands can be shared using combinations of administrative measures (time, geographic and interference management) and technical solutions (filters, smart antenna, smart transmitters (such as SDR and cognitive radio) and transmit power limitations combined with a relaxation of interference constraints all of which will undergo further technical development over the course of the license agreements. Pooling could make infrastructure sharing not just a means to ensure better general coverage at shared cost but ensure better end-services for the consumers.

Such processes make sense in addressing the provision of universal broadband in Ireland. Therefore, eircom would call for broader consultation, incorporating the above concepts into the framework for access before any decision is made on future licensing assignments or future access mechanisms.

Indeed, changes that have been recently introduced in the regulatory framework governing the electronic communications sector across Europe, whereby Member States are obliged to introduce a trading mechanism for spectrum, also provide a useful enabling legislative basis for the introduction of more innovative uses of spectrum assignments. This, coupled with the current deliberations on a radio spectrum plan for the European Union, where the need for innovative ways to manage used of spectrum, also provides ComReg with a framework in which to pause and reflect on the most suitable approach to future management of spectrum resources in Ireland.

That being said, the acknowledgement by ComReg of the benefits of approaching future access to radio spectrum rights in a holistic manner is to be welcomed as a step towards a reflective long-term approach to spectrum access. A holistic approach to determining spectrum access does address some of the concerns outlined to date that supported the eircom Group's previous requirement to proceed on a mediated basis. Surety of access and surety of spectrum supply under-pins any operators' long-term business strategy. By assessing spectrum bands together, and basing an access model on supply across a number of inter-related and complementary spectrum bands, industry is provided with a mechanism on which to determine this supply.

The eircom Group is, however, disappointed that ComReg has not, at this stage, proposed the inclusion of the 1800 MHz and 2600 MHz bands within the current consultation. As highlighted, operators require long-term certainty of access to ensure adequate investment within the network. By choosing not to include detailed discussion on either 1800 or 2600 MHz, the current document falls somewhat short in its analysis, with further detailed consultation on the inclusion of these two bands in an auction process required. It should be acknowledged that this may serve to only additionally delay a decision on an access mechanism and ComReg should, therefore, move to remedy this situation as soon as possible.

1. ComReg proposes that new services deployed in the 800 MHz band in Ireland employ frequency division duplex mode of operation. Do you agree with ComReg's proposal? Please provide reasons for your view.

The European Commission mandated CEPT to report on "Technical considerations regarding harmonisation options for the digital dividend in the European Union". CEPT report 031 "Frequency (channelling) arrangements for the 790-862 MHz band" (Task 2 of the 2nd Mandate to CEPT on the digital dividend) has developed one preferred harmonised frequency arrangement based on the FDD mode.

CEPT has considered the benefits and risks of having two options (i.e. FDD and TDD) for frequency arrangement against having a single preferred frequency arrangement and came to the view that the advantages of a single preferred frequency arrangement for this band (i.e. FDD) are:

- reduced development and operating costs for future radio infrastructure or terminal equipment to be used in the 790-862 MHz band by avoiding the fragmentation of the CEPT market in this frequency band that could occur with incompatible frequency arrangements. A CEPT-wide harmonization focusing on a single frequency plan based on the FDD mode will benefit the industry and consumers;
- increased opportunity and reduced costs for roaming services within CEPT;
- simplified licensing process;
- market certainty: Industry requires visibility to launch development of radio equipment to be ready on time according to the expectation of the future licensed operators in the 790-962 MHz band.

Today, industry is almost unanimously supporting FDD duplex mode in this frequency band. In addition, it has been shown by CEPT that the protection of base station reception from TV emissions is much more challenging than the protection of terminal reception. Therefore, the TDD frequency arrangement, where base stations are receiving over the whole band, creates much more difficult coordination challenge than FDD in the case where a neighbouring country wishes to continue to use the band for broadcasting.

The European Commission has accepted CEPT report 031 and CEPT's recommendations are included in the Commission Decision 2010/267/EU on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union.

For the above reasons the eircom Group strongly agrees with ComReg's proposal that Frequency Division Duplex should be employed in the 800MHz band in Ireland. This will ensure that Ireland enjoys the economic benefits associated with the pan-European harmonised exploitation of this band.

eircom strongly recommends that ComReg adhere to the CEPT preferred harmonised frequency arrangement of 2 x 30 MHz with a duplex gap of 11 MHz, based on a block size of 5 MHz, paired

and with reverse duplex direction, and a guard band of 1 MHz starting at 790MHz. The FDD downlink starts at 791 MHz and FDD uplink starts at 832 MHz.

2. ComReg proposals that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 Mhz band in Ireland. Do you agree with ComReg's proposal? Please provide reasons for your view.

The European Commission mandated CEPT to report on "Technical considerations regarding harmonisation options for the digital dividend in the European Union". CEPT report 030 "The identification of common and minimal (least restrictive) technical conditions for 790 - 862 MHz for the digital dividend in the European Union" has proposed block edge masks (BEMs) which meet this mandate and support harmonization.

The European Commission has accepted CEPT report 030 and CEPT's recommendations are included in the Commission Decision 2010/267/EU on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union.

For the above reasons, eircom agrees with ComReg's proposal regarding block edge masks which will align Ireland to European harmonisation activities, and enabling Ireland to take advantage of market momentum and the resulting economies of scale.

3. Do you agree with ComReg's proposal to proceed with a joint award of the 800 MHz and 900 MHz bands. Please provide reasons for your view.

eircom recognises why ComReg has proposed to address future access to spectrum within the 800 and 900 MHz bands in tandem.

As highlighted in the introductory section, and in previously responses to consultation on liberalisation of the 900MHz band and future licensing, the benefits of a holistic approach to spectrum access have been more than demonstrated. In this regard, therefore, the current proposals go some way to alleviate the concerns that eircom has expressed to date.

eircom has, however, repeatedly argued that if an auction is the chosen format on which to determine future access rights, then this should not be approached on a piecemeal basis. Whilst grouping access to 800 MHz and 900 MHz together may go some way towards addressing mobile operators' concerns, crucially the current proposal omits the inclusion of the 1800 MHz band and is silent on more innovative methods of spectrum allocation, sharing and pooling. Further consultation, coupled with a detailed proposal as to how 1800 MHz could be included within the scope of an auction process is, therefore, required before any decision on how to progress is established.

In the responses given to previous consultations regarding spectrum suitable for harmonised mobile use, the merits of pursuing a strategic and holistic approach towards national spectrum policy were highlighted. The Department for Communications' and Broadcasting Authority of Ireland's clarifications over the summer regarding the availability of the 800MHz band from 2013

onwards provide the basis for a more holistic approach to be taken and eircom welcomes ComReg's recognition of this opportunity[1].

However, as discussed in more detail in response to Question 4, it is eircom's assertion that the 1800MHz band should also be assessed for inclusion within this combined process. Subject to ComReg's ongoing review of the current and future use of the 2.6GHz band, there may also be an opportunity for that band to be included and further consultation on the issue should also address the possibilities offered through access to this band.

eircom is of the position that all stakeholders – including all operators - will benefit when the immense opportunities offered by the 800mHz spectrum are considered distinctly light of the prospect of allocating both sub 1g bands.

Over the past year eircom has been considering how best to provide next generation broadband to rural customers, and eircom's analysis, supported by external experts, suggests that wireless solutions in the 800MHz band maybe the only economically viable solution to providing next generation broadband to a significant proportion of the rural population. eircom believes that ComReg needs to take sufficient time to engage in a broader process involving all relevant stakeholders; including, but not limited to, the DCENR, the Department of Finance, the Department of Enterprise, local councils, rural communities, mobile and fixed operators and the IDA. To this end, eircom intends to make a detailed submission of these findings to Comreg and other stakeholders on this analysis.

In section 2.4.1 of the consultation ComReg sets out its view of the benefits of combining the 800MHz and 900MHz bands into a single award process. eircom agrees the bands are substitutable over the time period under consideration and that a combined approach to award could lead to more efficient outcomes. eircom also recognises, in principle, that combined consideration of the bands presents an opportunity for greater consumer and competition benefits. However, eircom remains of the view, as most recently expressed in the response to ComReg 09/99 (pages 5 through 18), that a full band auction of 900MHz is a disproportionate regulatory measure and ComReg has not explained in any detail the reasons for its choice of a full band auction in light of eircom's representations on this issue. ComReg is required under Regulation 19 (4) of the Framework Regulations to take into account representations made by respondents to consultations.

Of fundamental concern is the inherent risk created by an auction to generate significant consumer disruption, as highlighted in detail in our previous submissions. In section 2.4.1, sub-section 5, ComReg acknowledges that such a risk exists, albeit solely in ComReg's view in respect of O2 and Vodafone, but seeks to diminish the significance of concerns by suggesting that more spectrum will lessen pressure on 900MHz and that existing licences have sufficient time to adjust.

[1] ComReg 10/59

4. Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons with your view.

It is noted that ComReg has acknowledged that there is merit in considering the inclusion of 1800 MHz spectrum within a joint auction of 800 and 900 MHz spectrum on the grounds that it would lead to greater economic efficiency and would provide the best opportunity for entrants. eircom welcomes this development.

As argued in previous submissions to consultation, it is eircom's view that a piece-meal approach to future spectrum licensing would lead to huge inefficiencies in the market, with the uncertainty of release leading to the high probability of mis-valuation. This situation could be realised if ComReg proceeds to hold an auction of closely related spectrum bands in isolation.

As argued in detail to date, the inter-dependence of the 900 and 1800 MHz bands, the pace of technological change which will ensure the availability of equipment for UMTS and LTE to provide services within the 1800 MHz band, and the increasing demand that operators have for sufficient spectrum assignment, are all driving the need for clarity in the assignment process. Holding back large amounts of potential substitutable or complementary spectrum at the current time, within a limited auction design solely addressing the 800 and 900 MHz can only result in a flawed auction process which will realize an inefficient outcome.

A number of European counties have recently taken steps to both liberalise current spectrum assignments addressing access to 900 and 1800 MHz bands in tandem, or to provide for new liberalized assignments in both. In eircom's assessment of the approach adopted across Europe, no example can be found whereby a regulator in seeking to reassign spectrum rights to operators currently operating within the 900 and 1800 MHz bands, or indeed proposing a auction process for future rights, has chosen to isolate the assignment of 1800 MHz band from that of 900 MHz band. Indeed, where regulators have acknowledged the benefit of a holistic approach, many have recognised the benefit of simultaneous assignment across a number of bands be that through administrative assignment or auction.

Taking the above into consideration, there are a number of issues that will need to be addressed if the 1800 and/or the 2600 MHz spectrum bands are included in a combined auction with the 800 and 900 MHz bands. These include:

- an appropriate overall spectrum cap – as acknowledged by ComReg and DotEcon the 1800 MHz band is an important substitute band for capacity and an important source of capacity for new entrants. The eircom Group agrees with this assessment and suggests that the 2600 MHz band is equally important. Given this importance and the substitutability of spectrum between high and low bands, an overall spectrum cap is required to prevent high asymmetry in spectrum holdings. This cap should facilitate competition between bidders in the auction but not be so high as to prevent all existing operators from gaining a significant amount of spectrum in the higher bands.
- reserve prices – the reserve price for different spectrum bands needs to reflect the underlying differences in value between them.

- eligibility considerations – the eligibility of different bands needs to reflect their anticipated underlying value to prevent the higher bands from being used strategically to create a bidding advantage during the auction.

Technical developments are also driving the requirement to determine access through multiple band access models. As mobile technologies evolve from GSM to 3G/HSPA+, LTE, LTE Advanced and beyond, operators must evolve their spectrum strategies accordingly. Spectrum strategies need to ensure support for legacy technologies, such as GSM, as well delivering the high peak speeds and network capacities associated with future proofed technologies, such as LTE.

With GSM, operators use complementary spectrum below and above 1 GHz i.e. 900 and 1800 MHz. The 900 MHz is used as a coverage layer for both rural and urban areas, due to its superior propagation characteristics and its relaxed frequency reuse pattern. The 1800 MHz layer serves as an additional capacity layer in dense urban areas.

However, as we move towards LTE, where high subscriber bit rates and high network capacities are required, operators will be driven to predominantly use frequencies above 1 GHz, with limited use of frequencies below 1 GHz, in dense urban areas. This is because:

- high bit rate, high capacity networks drive the requirement for a dense distribution of base stations, which overcomes the propagation disadvantage associated with frequencies above 1 GHz;
- the efficient propagation of frequencies below 1 GHz, the frequency reuse pattern associated with LTE, the difficulty in down tilting frequencies below 1 GHz (wide vertical beam-width), all contribute to raising the possibility of interference and prevent the use of sub 1 GHz LTE as a blanket coverage layer for mobile broadband in dense urban areas.

Indeed, deployment of HSPA+ base stations at 2100 MHz in a dense grid formation has already shown that frequencies above 1 GHz can provide both a coverage and capacity layer. The flexibility and bandwidths associated with LTE will build on this coverage and capacity capability.

Operators will need to use sub 1 GHz spectrum (LTE and/or HSPA+) for both high capacity and coverage in rural areas due to the lower density of subscribers and the associated propagation challenges.

As the evolving spectrum strategies require the use of frequencies above and below basis 1 GHz, it's imperative that both types of spectrum are made available and that there is clarity around the timing for the release of such spectrum. Hence eircom encourages ComReg to endorse a holistic approach within any spectrum access decisions.

International examples can be drawn upon to illustrate both this requirement and this deployment. Several European countries (Sweden, Norway, Finland, Denmark, Netherlands, Denmark, Germany and Austria) have already moved to make the 2600 MHz spectrum available on a technology and service neutral basis. Indeed the first LTE networks in the world were launched in Sweden and Norway using the 2600 MHz band. Furthermore, T-Mobile Austria has confirmed that its 4G Long-Term Evolution (LTE) network has gone live in the city of Innsbruck, just four weeks

after the completion of the country's spectrum auction, which took place between 13 September and 20 September 2010.

As similar bandwidth availability also exists at 1800 MHz, compared to the 2600 MHz band, many European countries are now focusing on making this band available on a technology and service neutral basis. Indeed LTE equipment is currently becoming available from vendors in this band.

For the above reasons, eircom strongly urges ComReg to make spectrum available on a holistic basis, adding frequencies above 1 GHz to the current process for 800 and 900 MHz for consideration in a spectrum access strategy for Ireland.

As 2 x 75 MHz is available in the 1800 MHz band, it is recommended that a cap of 2 x 20 MHz is applied for any one operator. This enable competition sand support of maximum capacity and subscriber bit rates for the maximum number of operators.

Q.5 Do you agree with ComReg's Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

eircom accepts the need to put interim measures in place until broader national policy is resolved as the only proportionate solution to the pressing expiry of both Vodafone's and O2's 900 MHz licences. This will preserve continuity of service mitigating the near term risk of consumer and reduction in competitive forces.

It is noted that in ComReg's position at section 3.2.5 of the consultation it states *"the situations of existing 900MHz operators licensed for GSM, on the one hand, and other operators (or new entrants) in other frequencies, on the other, are not appropriate comparators for purposes of considering discrimination in the current context."*

eircom agrees that the circumstances of existing licensees in the 900MHz band are different to those of other interested parties and consequently different treatment can be justified. In this regard, and as set out in more detail within this response document, ComReg must acknowledge the very real risk to business continuity inherent in its full band plan auction proposals and take proportionate measures to facilitate continuity of service for existing licensees.

eircom would also agree that it is appropriate that existing licences should be rolled over with no change of scope and hence should be restricted to the provision of GSM services, in accordance with the restrictions placed on Meteor.

Q.6 Do you agree with ComReg's proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

eircom agrees with ComReg's basic proposition that spectrum fees should be adjusted for changes over time. Further, the CPI inflation index is a generally accepted index. As ComReg notes between May 1996 and July 2010 inflation in Ireland was 42.54%.

It is noted, however, that ComReg has not been consistent in the calculation of the annual equivalent of once off fees relative to its proposals in respect of new licences. ComReg proposes to annualise the one off spectrum access fees paid in 1996 by Vodafone and O2 by simply dividing by the licence duration of 15 years to provide a pro rata equivalent.

However, eircom would argue that account should be taken of the time value of money in converting a one off fee into an annualised equivalent. Indeed, this approach is acknowledged and applied elsewhere in the consultation paper where a discount rate of 10.2% is used to split a proposed minimum price of €25 million 50/50 into an upfront reserve price and annual spectrum usage fee.

Both on grounds of sound practice and consistency, the approach adopted in calculating the annual equivalent of a lump sum should be the same in both instances i.e. a discount rate should be applied. Applying a discount rate of 10.2% and licence duration of 15 years yields yearly equivalents as shown in the below table (with the pro-rata calculations shown for comparative purposes).

Table 1: Pro rata and annuity equivalents of one-off spectrum access fees

Operator	Spectrum access fee (1996)	Pro-rata yearly equivalent (divide by 15)	Equivalent annuity for discount rate of 10.2%
Vodafone	€12,697,381	€846,492	€1,688,475
O2	€19,046,071	€1,269,738	€2,532,713

The appropriate equivalent annualised fee is therefore 100% greater than the fee calculated on a pro-rata basis. Adjusting for inflation yields the following results.

Table 2: Pro rata and annuity equivalents of one-off spectrum access fees

Current GSM licence fees	Vodafone	O2
Spectrum access fee (for 15 year licence)	€12,697,381	€19,046,071
Spectrum access fee per annum (annuity equivalent)	€1,688,475	€2,532,713
Spectrum usage fees per annum (€25,395 per channel, 36 channels)	€914,220	€914,220
Total fees per annum (access + usage)	€2,602,695	€3,446,933

Current GSM licence fees	Vodafone	O2
Proposed fee allowing for CPI inflation	**€3,709,881**	**€4,913,258**

Q. 7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg.s statutory functions, objectives and duties.

n/ a

Q. 8. Do you agree with ComReg's proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

Yes, eircom agrees with the principle of a sub 1GHz cap.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

eircom accepts the argument that a sub 1GHz cap of 2x20 MHz should be established in advanced of the auction.

Whilst eircom supports the 2 x 20 MHz spectrum cap, a disadvantage of increasing the cap from 2 x 10 MHz, is that O2, Vodafone and Meteor face the risk of not being able to retain 900 MHz spectrum after 2015. In the 09/99 auction design it was not possible for incumbent 900 MHz operators to prevent one of their number from obtaining at least 2 x 5 MHz, under the new proposals this is no longer the case. In the 10/71 auction design, any of the incumbent 900 MHz operators may fail to win any 900 MHz spectrum in the 2nd time slice.

For an incumbent 900 MHz operator that fails to win 900 MHz spectrum in the 2nd time slice, this will have a substantial impact on consumers and the operator itself:

- consumers will face the disruption of having to migrate to more expensive price plans (since replacement services are likely to be based on inherently more expensive technology);
- rural subscribers may face service disruption until 3G and/or LTE services reach the same extent of coverage as GSM;
- an operator that fails to obtain 900 MHz spectrum in the 2nd time slice will face costs in terms of subsidies and commissions in the early migration of subscribers from GSM services to 3G or LTE.

Therefore, an incumbent operator that is denied access to 900 MHz spectrum will face substantial costs compared to operators that continue to have access to 900 MHz spectrum. This imbalance in costs will distort the mobile market.

eircom believes that the simple remedy to this situation is to exclude 2 x 15 MHz of 900 MHz spectrum from the auction and to award 2x 5 MHz each directly to O2, Vodafone and Meteor. Such an award should be subject to the same annual fees as auctioned spectrum and an appropriate one-off payment to take account of its opportunity cost. It is suggested that this directly awarded spectrum is priced at the reserve price adopted for the auction.

Q. 10. Do you agree with ComReg's proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

eircom does not accept that holding an auction for the 800 MHz and 900 MHz band in isolation from the 1800 MHz band (with possible inclusion of the 2.6 band) is in the best interests of either the Irish consumer, the mobile market in general or the long-term viability of competition within the Irish mobile market. The benefits of a holistic approach to spectrum access is highlighted in detail in eircom's response to Question. 4,

eircom's comments in this submission, in particular in response to Questions 11-14, are without prejudice to eircom's preference for the administrative assignment of the 900 MHz band.

Q. 11. Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view.

In the context of a joint award of 800 and 900 MHz spectrum, eircom would argue that the proposal to mirror assignment in the 800Mhz band with that of the 900 MHz band is the most likely to provide an efficient outcome.

Q. 12. Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

Notwithstanding our views on the need for a holistic award process, eircom is supportive of the use of a Combinatorial Clock Auction (CCA) for a combined spectrum award.

Spectrum uses in multiple bands are substitutable and complementary and it is important to have the opportunity to express all associated valuations in a combinatorial format. eircom agrees with the DotEcon assessment (ComReg Doc 10/91a. Section 2.14. paras 27-31) that the CCA format in conjunction with the relative cap activity rule provides greater safeguards against unintentional loss of business continuity.

The CCA format also provides for bidders to make rational choices between potentially substitutable and complementary spectrum whilst discouraging strategic behaviour. It is noted that the description of the auction format in both the ComReg consultation document and supporting annexes does not provide a detailed description of the auction rules, however, from the information provided eircom has some areas of concern. Particular aspects that require attention are as discussed below.

Lot categorisation

The consultation document 10/71 is ambiguous on the precise lot categories that would be applied in a combined 800/900 MHz auction. It refers explicitly to categorisation into two time slices but does not state explicitly that each band would be a separate category. The DotEcon report (ComReg Doc 10/91a) recommends separate categories for each band (see para 90), although much of the preceding sections imply a single category in each time slice (see paras 35, 37, 38). Operator valuations in each band can be expected to vary depending upon:

- whether or not the operator has a legacy subscriber base to support within the band;
- the availability of different equipment and standards for each band;
- the degree of complementarity between spectrum in the two bands (i.e. the precise distribution of a package between spectrum bands may be important);

eircom considers it essential, therefore, for an efficient auction that bidders are able to express demand independently for each band during the primary rounds in response to clock prices and observed demand.

Application stage

The application stage is described in the DotEcon report (ComReg1071a, para 39), which states that *"As part of their applications, bidders would be required to state the number of lots in each time category they wish to be assigned at the reserve price. This will be taken as a binding bid and considered when determining winners in the same way as a bid made in a primary round."*

It is noted that without expressing demand within each band and time slice, the application stage would provide insufficient information with regard to band choice to proceed to the assignment stage.

Method of dealing with Meteor's option to liberalise current spectrum licences

ComReg Consultation 10/71 does not provide any detail of how eircom's option to liberalise its spectrum holdings in the 900 MHz band would be accommodated within the auction. eircom anticipates a consultation on the complete set of auction rules to allow comprehensive feedback, but in the meantime it is necessary to outline some important principles that should be applied with regard to auction design so that the award process can be efficient and individual operators not disadvantaged.

All operators will have the freedom to bid for 1, 2, 3 or 4 lots in the 900 MHz 1st time slice category during the auction. eircom should have the right to bid for these same combinations without prejudice to its decision whether or not to liberalise one or both of its spectrum lots. In this regard it is noted that spectrum supply for other bidders is the same in the primary rounds and supplementary bids round whether or not eircom chooses to its option to liberalise.

eircom should not be required to choose whether or not to liberalise its 900 MHz licences until it knows whether it has won further spectrum lots in the auction. To do otherwise would mean it risks failing to win the liberalised spectrum in the auction or the auction complexity will be increased unnecessarily by the inclusion of contingent bidding.

eircom's decision whether or not to liberalise its 900 MHz spectrum depends on how much 900 MHz spectrum it wins in the auction. Requiring eircom to face this decision in the absence of price discovery and the outcome of the primary bid rounds, would degrade the efficiency of the spectrum award.

Method of dealing with unsold spectrum

ComReg proposes an auction reserve price which by its own admission is at the high end of benchmark valuations. With a spectrum cap of 2 x 20 MHz, there is a high risk that there is insufficient demand in the primary and supplementary bid stages to occupy all the spectrum offered, and therefore some spectrum is likely to remain unsold.

It is noted that in the consultation 10/71 the prospect of unsold spectrum at the end of the auction is not addressed. ComReg has not stated how it intends to deal with spectrum unsold at the end of the supplementary bids stage. In consultation 09/99 a method was proposed to allow bidders to submit bids that exceeded the spectrum cap in order that no spectrum remained unsold. In response to that consultation it was argued that unsold spectrum should not be offered to other bidders in contravention of the spectrum cap.

In ComReg document 10/71a, DotEcon illustrates the impact of two operators gaining 2 x 25 MHz on another operator and argues that *"... such a result would substantially damage the ability of such an operator to compete effectively in the market for 3G services over the coming years." and that "this is in addition to the disruption that might result from an existing 900MHz operator not obtaining rights to spectrum usage in this band for serving existing GSM customers."* (see para 123). DotEcon concludes that this is a low probability outcome, but eircom notes that the prospect of unsold spectrum cannot be considered low probability when reserve prices are set according the upper end of the range of market benchmarks for clearing prices.

This argues that ComReg should not allow the 2 x 20 MHz cap to be exceeded by any bidder. If the facility proposed in consultation 09/99 is retained (whereby bidders may extend their bids for unsold spectrum beyond the spectrum cap) then this could facilitate highly asymmetric spectrum holdings and severely distort the mobile market.

Q. 13. Do you agree with ComReg's proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

In eircom's response to ComReg 09/99 it was argued that the benchmark chosen was high by international standards when a like-for-like comparison is considered, that the benchmark is inherently uncertain given the range of values and dependence on circumstances and expectations

at the time of the auction, and that given the inherent uncertainty caution is justified in setting the reserve price. Specifically a 50% discount on estimated value was proposed in setting the reserve price.

It is noted that the benchmark range has changed little with the addition of new data and re-estimation since the previous consultation in December 2009. However, ComReg proposes a minimum price of €25 million for 2x5 MHz - near the upper end of the range estimated by DotEcon

of €18 million to €26 million. This represents a small reduction from the previously proposed minimum price of €30 million in December 2009. ComReg has not, therefore, adopted a conservative approach in setting the reserve price.

Since the previous consultation three things have changed which imply that spectrum value may be lower and that the arguments for a conservative approach in setting the reserve price are stronger than they were previously:

- the outlook for GDP, and more particularly real disposable income growth (given the increase in the national debt burden and credit rating downgrade which in turn imply a greater share of national income required to pay interest and repay debt), has deteriorated with the announced cost of the Anglo Irish bailout. This might be expected to impact on the expected value of spectrum in Ireland;

- the supply of spectrum has increased with clarification regarding analogue TV switch off and the proposed combined auction. Expected spectrum supply is therefore greater and uncertainty over value is greater implying a lower spectrum valuation and greater grounds for caution;
- the auction format in relation to caps and the move to a second price format has alleviated concern in relation to tacit conclusion, thereby greatly reducing the argument for a high reserve price to prevent tacit collusion.

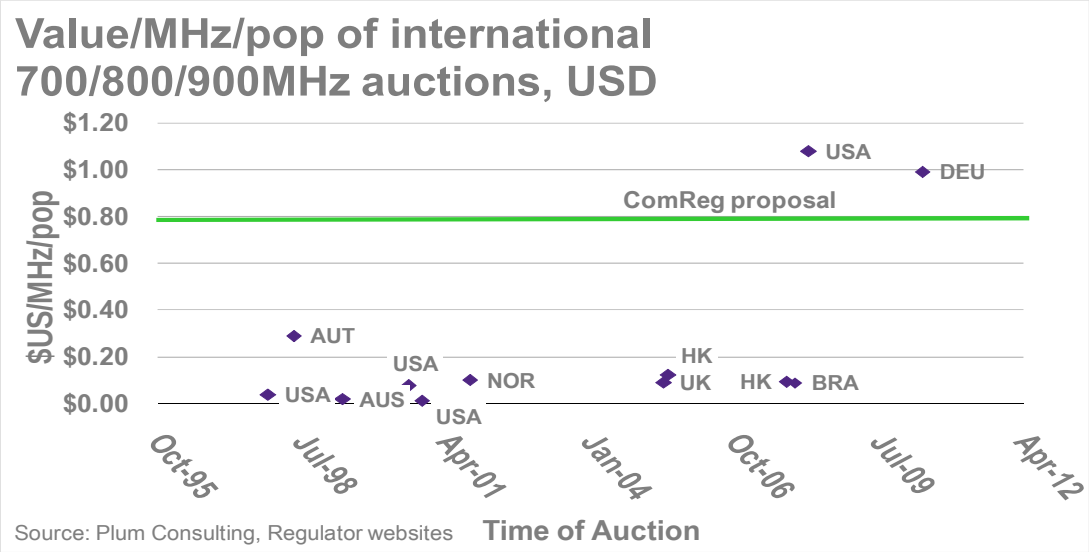
These changes point to the need for an even more conservative approach than was justified, but not factored in, by ComReg previously. Before developing these points we first briefly consider the new benchmarks available since the previous consultation.

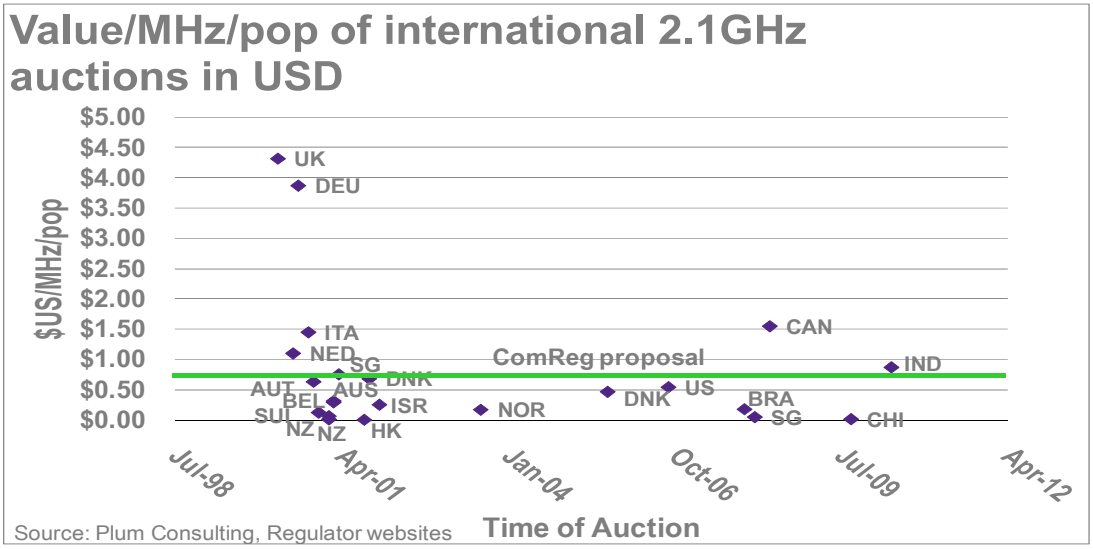
New information is available in terms of benchmarks

In its report DotEcon considers new auction data in its updated benchmarking exercise drawing on outcomes of auctions in Bazil, Singapore, Finland, Netherlands, Denmark, India and Germany. These data points have been added to the UHF and 2.1 GHz value/MHz/pop charts presented previously. The ComReg proposal in terms of the reserve price has also been updated to reflect the change from €30 million to €25 million and to reflect the increase in population in Ireland. ComReg's proposed changes would result in a reserve price equivalent to $0.79/MHz/pop in US$[2].

The following figures illustrate UHF and 3G/2.1 MHz outcomes respectively relative to the reserve price proposed by ComReg.

[2] Based on an exchange rate of 1.41 and a population of 4,459,300.





It is also noted, in relation to the German auction, that ComReg treats as synonymous the proposed reserve price and the auction outcome (page 19):

"*The only price point to date for liberalized sub-1GHz spectrum – 800MHz spectrum sold in the recent Germany Frequency Auction – serves as a useful cross-check on the consistency of our benchmarks. The spectrum sold for an average of €0.70 per MHz per head of population or equivalently just above €31m for a 2x5MHz licence in Ireland. This supports our argument that our benchmark values are modest and likely to understate the true value of liberalized sub 1-GHz spectrum in Ireland. Hence the risk associated with choking off efficient demand by setting minimum prices in this range should not be high.*"

The two are of course different things, and an outcome should not be used as a benchmark for a proposed reserve price. The reserve price in Germany was well below that proposed by

ComReg[3]. Further, current economic conditions and the near term outlook for Germany is more positive than for Ireland.

Circumstances have changed materially since the previous consultation

Since the previous consultation reasonable expectations regarding the supply-demand balance have shifted materially with increased supply for spectrum, the auction format has changed in ways that alleviate concern regarding tacit collusion and uncertainty has increased. All of these factors point to the need for a more conservative approach in setting the reserve price.

Increase in anticipated spectrum supply

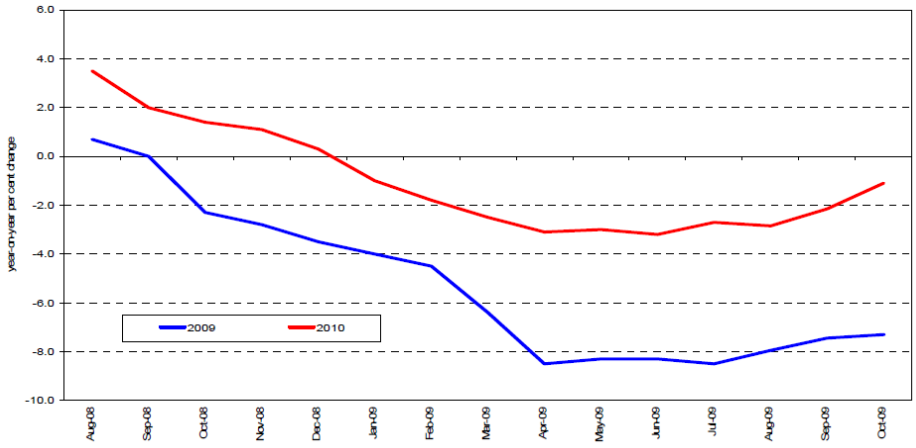
Reasonable expectations regarding the supply of spectrum have been increased through clarification of the position regarding 800 MHz. Further, consultation on the future use of 2.6 GHz spectrum raises the prospect of availability from 2014. These considerations, whilst in the interests of consumers and the economy, lower the expected value of spectrum compared to the situation applying at the time of the previous consultation. They also reduce the materiality of the argument that a relatively high reserve price is required to prevent tacit collusion.

The increase in supply expectations can be expected to swamp any increase in expected value associated with spectrum liberalisation – which might reasonably have been anticipated for some time in any case.

The economic outlook and implied spectrum demand has deteriorated

At the time of the previous consultation information was available showing the deterioration in consensus GDP forecasts.

Consensus GDP forecasts for 2009 and 2010 from August 2008 on[4]



New information implies a further deterioration in both the short and medium term outlook. This might be expected to impact negatively on anticipated revenues in relation to mobile broadband and, in turn, on the value of spectrum.

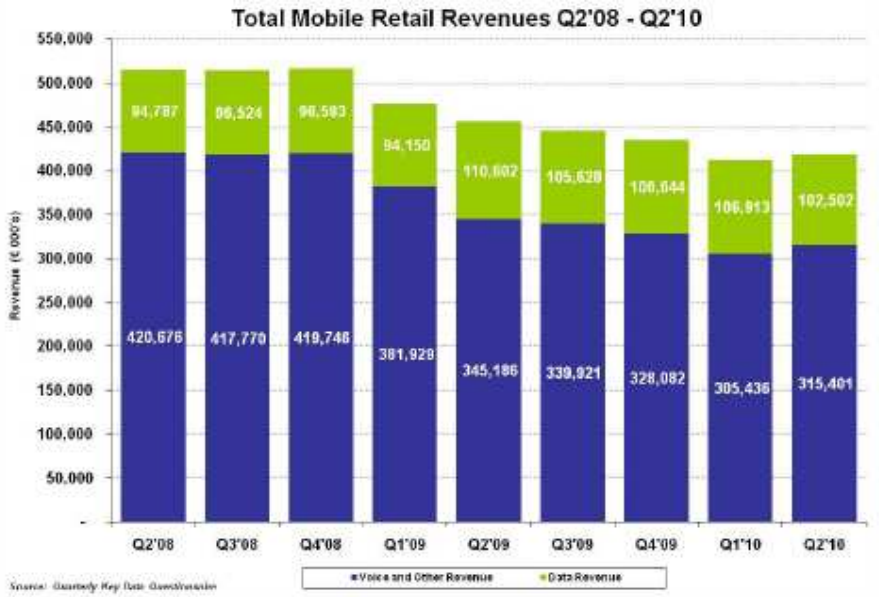
[3] €2.5 million per 5MHz paired. See results of round 1 in German auction

On 4 October the Irish Central Bank lowered its forecast for GDP from 0.8% in July to 0.2% for 2010 and from 2.8% to 2.4% for 2011[5]. However, the impact of the announcement on 30 September 2010 that the bailout cost for Anglo Irish Bank could be as high as €34 billion may not yet be fully reflected in the GDP outlook. Further, on 6 October, the credit rating agency Fitch downgraded Ireland from A+ from AA-[6].

A forecast published by NCB on 12 October[7] includes reductions in GDP growth for the period out to 2014 to the 2% region rather than the 3% previously assumed. Private consumption growth, arguably more relevant to the value of spectrum than GDP growth, is forecast to grow more slowly with growth approximately 0.5% per annum lower than GDP growth to 2014.

The pre-budget report and commentary on it, anticipated in November, should shed further light on the outlook taking account of the deterioration in the fiscal position and credit downgrade.

Mobile revenues provide another indicator of the impact of the economic deterioration. They have fallen from around €515m in Q4 2008 to around €418m in Q2 2010 (based on two quarters of data) – a fall of approximately 19%.



The auction format has changed

The auction format has changed in respect to an increase in spectrum supply and a relaxation of spectrum caps. The spectrum cap increase can be expected to increase competitive pressure in the auction and reduce the risk of tacit collusion (particularly strategic unilateral demand reduction).

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[4] Reported in Pre-Budget Outlook, November 2009, http://www.finance.gov.ie/documents/publications/prebudget09/PBOfinal.pdf

[5] Central Bank Quarterly Bulletin. 4 October 2010, http://www.financialregulator.ie/publications/Documents/CBANK-Q4-REPORT.pdf

[6] FT. 6October 2010. http://www.ft.com/cms/s/0/1b579e6a-d14a-11df-8422-00144feabdc0.html?ftcamp=rss

[7] NCB. 12 October 2010. "Irish Economic Monitor-Growth outlook deteriorates." http://www.ncbresearch.com/fixed_income/IrishEconomyMonitorSeptember2010.pdf

The increase in spectrum supply means that bidders are likely to obtain larger packages with correspondingly lower marginal valuations.

Uncertainty has increased

Both the economic outlook and inclusion of 800 MHz spectrum involve an increase in uncertainty regarding spectrum value. Further, the appropriate level of caution in setting the reserve relative to estimated value increases with the level of uncertainty. The increase in uncertainty is therefore a reason to apply a larger discount to anticipated spectrum value, which itself is likely to have decreased given the shift in supply and demand, in setting a reserve price.

As ComReg notes (page 47):

"A more conservative minimum price lower within the estimated range would minimise the risk at which any efficient demand is choked off. This is relevant because of the greater uncertainty about valuations that the presence of the 800 MHz creates. This is both because there is uncertainty over the relative values of 800 MHz versus 900 MHz spectrum and also because the supply of sub-1 GHz spectrum is significantly increased. Thus in determining the minimum price for 800 MHz and 900 MHz spectrum for the upcoming auction, it is DotEcon's view to err on the side of caution."

The outlook for GDP, real disposable income and therefore demand is also arguably more uncertain now given uncertainty about how the upward revision to national debt will be reduced and increased uncertainty regarding the future credit rating for Ireland.

A conservative approach should be adopted in translating benchmark estimates into a reserve price

As a practical matter DotEcon observes that:
"..the ratio of reserve prices to minimum price achieved in spectrum auctions in their data set has an average value of just over 50%."

The reserve price proposed by ComReg does not reflect this orthodoxy. The arguments for a conservative approach have been strengthened by change in supply-demand balance, the change in auction format and the increase in uncertainty since the previous consultation.

There are three key risks to consider in setting the reserve price that could result in inefficient outcomes:

- that, due to tacit collusion, an inefficient auction outcome eventuates;
- that spectrum, that would allow better service and lower cost service, remains unallocated;
- that prospects for competition and investment are harmed.

Each of these is now considered in turn.

The risk of tacit collusion resulting in inefficient outcomes

ComReg express concern about the risk of tacit and conclude that (page 47):

"ComReg is of the view that a minimum price at the upper end of the range estimated by DotEcon is appropriate. ComReg is therefore proposing a minimum price of €25 million."

However, the addition of 800 MHz spectrum and the relaxation of spectrum caps implies that there are now potentially 16 bids over 13 lots whereas previously there were potentially 8 bids compared with 7 lots. In addition, the enhanced prospect of entry (and uncertainty on the part of bidders regarding this risk) and the second price format can be expected to enhance competitive bidding. For this reason DotEcon conclude that the risk of collusive behaviour is less and recommend that the minimum price therefore be set more moderately relative to estimated benchmark values. As DotEcon comment (page 4):

"...setting a reserve price too high risks choking off demand inefficiently; arguably we need to give somewhat greater weight to this risk that previously to reflect this greater uncertainty. This consideration suggests that a modest adjustment of minimum price may be needed."

The potential benefits of a higher reserve price in preventing tacit collusion would no longer therefore appear to be a material consideration.

A high reserve price risks preventing socially efficient use of spectrum

The economic costs of setting a price too high are in generally higher than the economic costs of setting a price too low. The reason for this is that inefficient non-use of spectrum can be expected to be more economically costly than the misallocation of spectrum which might arise and/or persist if prices are set too low. This is a key reason that both reserve prices and levels of administrative incentive prices (AIP) are in general observed to be set conservatively relative to estimated opportunity cost.

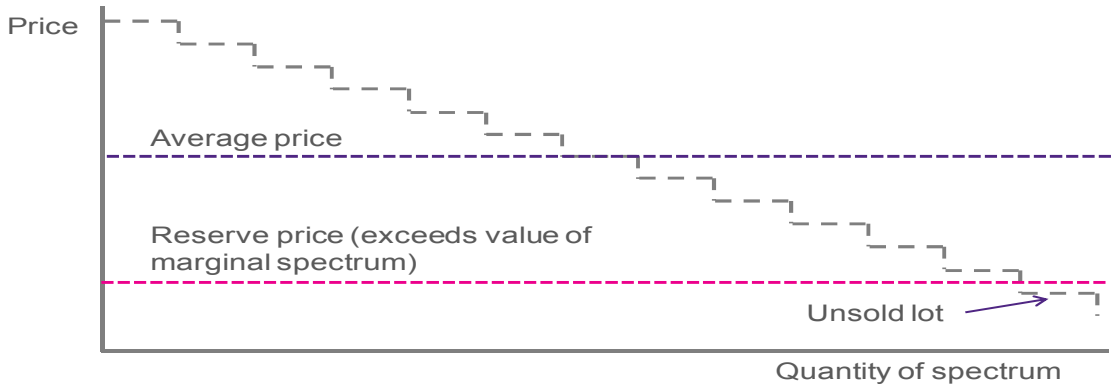
This point, in relation to spectrum pricing, is developed in a paper for Ofcom which modelled and quantified the efficient extent of caution in different circumstances[8]. To a reasonable approximation the economic welfare minimising discount (%) of price to the best estimate of opportunity cost is equal to the level of uncertainty measured as the standard deviation to mean ratio (%). An economically efficient discount of 50% or more on this basis is therefore plausible.

However, these calculations were based on an assumption of excess demand for spectrum, two alternative competing uses for the spectrum in question and an existing inefficient allocation (necessary conditions for potential gains from, spectrum pricing). In the situation under consideration here the reserve price involves the risk of a cost in terms of unused spectrum with little if any offsetting gain (since the auction itself should deliver an efficient reallocation).

Further, the risk that the reserve price results in some unsold spectrum blocks which would otherwise have enabled higher capability and/or lower cost services to be offered relates to the least valuable incremental spectrum lots across the total of 13 blocks. For example, a strong operator (O2 or Vodafone) might acquire 3 rather than 4 spectrum blocks or a weaker operator might acquire 2 rather than 3 blocks.

[8] OFCOM. 2007. "Aeronautical and maritime spectrum pricing" Appendix E: Loss functions. http://www.aegis-systems.co.uk/download/1824/aipreport.pdf

The following figure illustrates the case where a reserve price which is low relative to the average price (reflecting average value) could result in an inefficient outcome whereby the least valuable spectrum – which would nevertheless result in better outcomes for consumer – remains unsold.



The impact of cash withdrawal on investment and competition

If the reserve price is relevant i.e. is binding on one or more lots, then the weakest bidder/s will end the auction with weaker balance sheets than they would otherwise have had. With well functioning capital markets this might not be a concern since the cash position of companies should make little if any difference to efficient levels of investment and/or competition.

However, if liquidity is constrained, then a weakened balance sheet may impact negatively on capital investment and on competition. In fact there is evidence that financial constraints are impacting negatively on otherwise efficient investment in the current economic climate[9].

There is, therefore, a risk that a binding reserve price will weaken the balance sheets of the weakest bidders and/or deter entry – thereby undermining efficient capital investment and reducing competition. In a worst case scenario this outcome might ultimately precipitate industry consolidation and a reduction in the number of independent network operators – an outcome that is more likely in Ireland given the relatively high number of licensed UMTS operators relative to market size.

The potential impact of the reserve price on balance sheet strength, investment and competition is a further argument for a conservative approach to setting the reserve price relative to available and comparable benchmarks.

Conclusion

Given the deterioration in the economic outlook, additional spectrum, increased uncertainty and reduced risk of tacit collusion a larger discount on the revised €18m to €26m range is required. A minimum price of €5-10 million is therefore proposed. This involves a larger discount than that previously proposed and reflects the deterioration in economic outlook, proposed expansion of spectrum supply in the auction, increased uncertainty and reduced risk of collusion.

[9] Campello, Graham and Harvey. December 2009, "The Real Effects of Financial Constraints: Evidence from a Financial Crisis". http://papers.nber.org/papers/w15552

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

eircom's position is unchanged on this point and would reiterate the position as outlined in the response to Question 5, that being that in the context of an auction process eircom acknowledges that there can be merit in establishing reserve process and spectrum usage fee (SUF) price levels respectively at 50% present value of the minimum prices. A balance needs to be struck between discouraging frivolous or non constructive speculative participation in an auction and facilitating near term investment in infrastructure development.

Q. 15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, The eircom Group or 3) and 7 years for a new entrant to the Irish mobile market.
Do you agree with ComReg's proposed coverage and roll-out obligation? Please provide reasons for your view.

eircom set out its detailed views in respect of coverage matters in its response to questions 12 through 21 of ComReg 09/99. ComReg's revised proposals are briefly outlined in the current consultation at section 4.6.3. ComReg states that it has "given due regard to the responses received to Document 09/99" in formulating its current view. While the summary proposals in the current consultation make positive advancements in a number of respects it is not clear to us that all our concerns have been fully considered in the absence of any detailed commentary from ComReg. Visibility of ComReg's reasoning would be welcome.

In respect of the current proposals please note the following:

eircom agrees with ComReg's proposal to set a symmetric obligation to provide coverage to 70% of the population which is consistent with our own previously expressed views. We also agree with Comreg that a holistic approach to coverage should be applied, whereby coverage from other bands (currently 2100 and 1800 MHz) could be combined with 800/900 MHz coverage.

eircom disagrees, however, with the requirement that a minimum of 50% population coverage target must be achieved with 800/900 MHz. As explained in answer to Q4, evolving technologies are driving a new approach to spectrum strategy. Urban areas will predominantly use frequencies above 1 GHz for both capacity and coverage, with limited use of sub 1 GHz frequencies. Sub 1 GHz use will be where it is most required, i.e. the less dense rural network.

The requirement to reach a minimum of 35% demographic coverage will therefore result in much higher population coverage than 70%. For example, if an operator uses frequencies above 1 GHz to provide mobile broadband for towns with a population of 6000 and associated areas or above, there will be approximately 57% population coverage. If the coverage obligation requires at least 35% population coverage, this 35% will be in the hard to serve rural network and will require an overall coverage of 92% (57+35). 57% population coverage is equivalent to approximately 6% of land area. The next 35% of population coverage could be equal to the next 50% of land area (approx).

Hence the requirement to reach 70% population coverage, with 35% provided by 800/900 MHz could lead to a sub optimal use of 800/900 in dense urban areas rather than an optimal use of higher frequencies delivering better peak rates and network capacities. eircom would strongly recommend, therefore, that the coverage target is maintained at 70%, but the choice of spectrum is driven by the market and customer requirements.

eircom does not agree that an asymmetric roll-out period has been objectively justified. In our view asymmetric obligations create risks of distortion both in terms of the effective operation of the award process in the near term and to the competitive functioning of the market in the longer term, as set out in the response to ComReg 09/99. In accordance with its obligation of transparency, ComReg must expose its reasoning to scrutiny as to why it feels these risks can be ignored.

Furthermore ComReg's revised proposals regarding 'preparatory licences' confer a period in the region of 1.5 years for a new entrant to significantly plan and deploy infrastructure in advance of licence commencement. Consequently ComReg's reasoning existing operators should be subject to a shorter timescale because they have access to existing infrastructure does not bear much weight. eircom remains of the view that obligations should be symmetric.

ComReg document 09/99 made an explicit proposal to allow multiple frequency bands to count towards 900MHz band coverage. In the current consultation ComReg states that its view is to

"*allow coverage and roll-out obligation to be met using the 800/900MHz frequency band or the 800/900MHz frequency band in combination with the other frequency bands....".*

It is not clear to eircom whether ComReg is proposing to allow multiple frequency bands to count towards coverage and roll-out as two options are presented. It is assumed, however, with the subsequent proposal, that a minimum of 50% coverage would be required using 800/900MHz bands, and that ComReg is proposing that multiple frequencies will count towards compliance with obligations. eircom supports this approach, but would welcome clarification of ComReg's intention in this regard.

eircom would welcome clarification as to what is meant by *"a minimum of 50% coverage"* to be provided using the 800/900MHz bands. Is ComReg proposing a minimum of 50% population coverage using the sub 1GHz bands or 50% of the 70% target (i.e. 35% population coverage)?

eircom believes that the latter may be a more appropriate interpretation for the following reason.

As the over 1 GHz band was available first for UMTS and considerable investment has been made in this band, it is possible that following the release of liberalised spectrum at 800/900MHz and 1800 MHz, that network deployment strategies may evolve away from the current heavy reliance on sub 1GHz frequencies for coverage and capacity in urban areas. This is further strenghtened by the fact the higher capacity requirements come earlier in the lifetime of the network than previously seen. Approximately 60% of the population lives in 10% of the geographic area of Ireland. Depending on the capacity requirements from these customers and depending on our ultimate preferred strategy, bands may be relied upon in different proportions.

eircom agrees with ComReg's view that coverage via national roaming should not count towards coverage and rollout obligations, consistent with our views expressed in response to ComReg 09/99. In ComReg 09/99 proposals were set out in respect of maintaining performance bonds. In our response to question 21 of ComReg 09/99 we argued against the proportionality of the proposal. It is noted that the current consultation makes no reference performance bonds and further clarification is sought in this respect.

It is noted that ComReg proposes to measure coverage in a method similar to option 1 discussed in ComReg consultation 09/99 where a target average field strength measured outdoors is set for different technologies. In principle eircom would support this proposal as it uses a harmonised and well established approach that is currently used for both GSM and 3G. The electric field strength effectively translates to the receive signal level at the antenna port (dBm), which in turn relates to the services that can be supported.

As technologies evolve, more services can be provided and more parameters need to be considered. For example with GSM, the main service was voice and the bandwidth was 200 kHz. 3G can support voice and packet data and uses a 5 MHz bandwidth. LTE and WiMAX will be more complex, as they can support, voice, multiple and high bit rates, variable bandwidths, variable number of resource blocks.

As LTE is quite complex, and as ComReg has already proposed not to have a QOS for broadband service, ComReg needs to be clear on the services that must be supported and the appropriate target electric field strength, bearing in mind the possible combinations of bandwidth and resource blocks.

Furthermore, when looking at the target electric field strengths for 3G, ComReg has simply proposed the electric field strength currently used for 3G at 2100 MHz. However, the relationship between power level and electric field strength is dependent on frequency and so different target values would be used at 800, 900 and 2100 MHz.

$$E\ (dB\mu V/m) = P(dBm) + 20 * \log f\ (MHz) + 77{,}2\ (dB) - Gi(dB) + Pcon\ (dB)$$

where:
E = electric field strength
P = power measured
C = conversion factor
f = frequency
Gi = isotropic gain of the antenna
Pcon= loss at the level of connections

In addition, ComReg is also proposing to use Ec/Io in terms of UMTS. eircom is concerned that ComReg is introducing a technology specific parameter to measure coverage, that is not currently used in any existing ComReg licences. It would be appreciated if ComReg would clarify how this approach is used internationally within the industry for coverage measurement and how a technology neutral approach can be used on a harmonised basis.

Further eircom would welcome a description of how Ec/Io would be measured and under what conditions (e.g. under what load).

Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.
Do you agree with ComReg's proposed quality of service obligations? Please provide reasons for your view.

eircom set out its detailed views in respect of coverage matters in its response to questions 22 through 33 of ComReg 09/99. ComReg's revised proposals are briefly outlined in the current consultation at section 4.6.4. ComReg states that it has *"given due regard to the responses received to the 09/99 consultation"* in formulating its current view. It is not clear that all concerns previously expressed have been fully considered in the absence of any detailed commentary from ComReg. Visibility of ComReg's reasoning would, therefore, be welcome.

In eircom's response to ComReg 09/99 we put forward our view that the imposition of quality of service obligations is highly disproportionate. In the current consultation ComReg has offered no reasoning to alter our view and appears to have disregarded eircom's concerns out of hand.

The following comments are made without prejudice to eircom's position that the imposition of quality of service obligations is unjustified.

In the current consultation ComReg proposes to set minimum QoS network standards for the availability of the network and for a voice call (non VoIP service) which it states will be similar to those proposed in ComReg 09/99. However, in the absence of a clear articulation of the precise metrics eircom is unable to comment beyond previous representations made.

eircom welcomes ComReg's confirmation that it no longer proposes a minimum QoS network standard for a broadband service. However, the current consultation is silent on other QoS related proposals put forward in 09/99 and therefore, it would be helpful if ComReg would clarify its intention in this respect.

It is disappointing to note that ComReg continues to propose periodic review of QoS licence obligations (section 4.6.6 of the current consultation) particularly as ComReg's stated justification is at odds with its proposal. ComReg states that *"we can observe the trend in mobile communications in Ireland and indeed across the EU has been towards a more liberal and less interventionist regulatory regime, as increasing competition and consumer choice, abetted by technological innovation, have reduced reliance on administratively assured standards."* eircom cannot, therefore, reconcile this valid observation that the market is delivering with ComReg's proposals to intervene in respect of establishing minimum network QoS standards. eircom remains of the view that the time for mandated minimum network QoS standards has passed.

With respect to ComReg's proposal to set a minimum standard for billing, ComReg appears to be proposing a more onerous obligation relative to its previous proposal in ComReg 09/99. In the current consultation ComReg proposes paper billing as the standard unless agreed otherwise with the expressed prior written consent of the customer. The current WT licence obligations establish the requirement for customer consent, however, they do not prescribe the means by which such consent is obtained. ComReg's requirement for written consent is overly prescriptive. eircom is

aware that O2's recent initiative to introduce paperless billing has raised questions as to whether consent should be considered on an opt-in or opt-out basis and this is an area that could be clarified further. However, the manner in which consents are collected does not need to be prescribed. Customer consents can be collected in a number of different and valid ways, such as via IVR selection, text message, call to customer care, and are not limited to written communication only.

eircom welcomes ComReg's recognition that a minimum standard for billing is more appropriately attached as a condition of the general authorisation or the User Rights Regulations, as it has cross sector applicability. ComReg states that this will be addressed by separate consultation by December 2011. eircom believes that the establishment of an appropriate cross sector minimum standard for billing should and can be completed in advance of new WT licences.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.
Do you agree with ComReg.s proposed miscellaneous obligations? Please provide reasons for your view.

eircom set out its views in respect of miscellaneous matters in its response to questions 34 through 36 of ComReg 09/99. ComReg's revised proposals are briefly outlined in the current consultation at section 4.6.5. ComReg states that it has "given due regard to the responses received to Consultation document 09/99" in formulating its current view. ComReg essentially restates its proposals in respect of the miscellaneous matters and it is not at all clear to us that ComReg has considered the points we raised in our response to ComReg 09/99. eircom's views remain as per our previous response and we would welcome visibility of ComReg's reasoning.

Q. 18: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability?
Please provide reasons for your view.

As we understand it ComReg is proposing that it will consider any requested variations to existing GSM900 licences on a case by case basis, should the outcome of the auction encourage the need for transitional arrangements. It is assumed that a request to vary a licence can only be made by the holder of that licence and as such ComReg's proposal appears reasonable.

In the previous consultation ComReg consulted on whether a 200 KHz adjustment may be required in the first time-slice in respect of Meteor's current assignment (question 9 of ComReg 09/99). It is noted that an assessment was carried out in ComReg 10/71c regarding the costs and timescales associated with such activity and concludes *"the figure of €x supplied by Meteor can therefore be accepted as a reasonable estimate of the actual cost"*.

The remainder of the consultation and supporting documents is silent on the issues raised by Question 9 of ComReg 09/99. ComReg is subject to an obligation to act transparently and is also required under Regulation 19 (4) of the Framework Regulations to take into account representations made by respondents to consultations. It would be helpful in this context if

ComReg could set out its position in relation to these issues, taking into account the submissions of respondents.

Q.19: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

eircom agrees in principle that a Memorandum of Understanding should be established to provide a basis for addressing any transitional issues arising between time slices. This must be established, following due consideration, in advance of the auction process so that all participants are aware of their potential obligations and duties.

Q. 20: Do you agree with ComReg's proposal to issue 'preparatory licences' to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

eircom agrees in principle to the proposal to issue 'preparatory licences' and would welcome the opportunity to review and comment on the draft terms of such licences.

3 Ericsson

800 MHz, 900 MHz and 1800 MHz
SPECTRUM RELEASE

A RESPONSE TO COMREG'S CONSULTATION PAPER 10/71

BY LM ERICSSON LTD

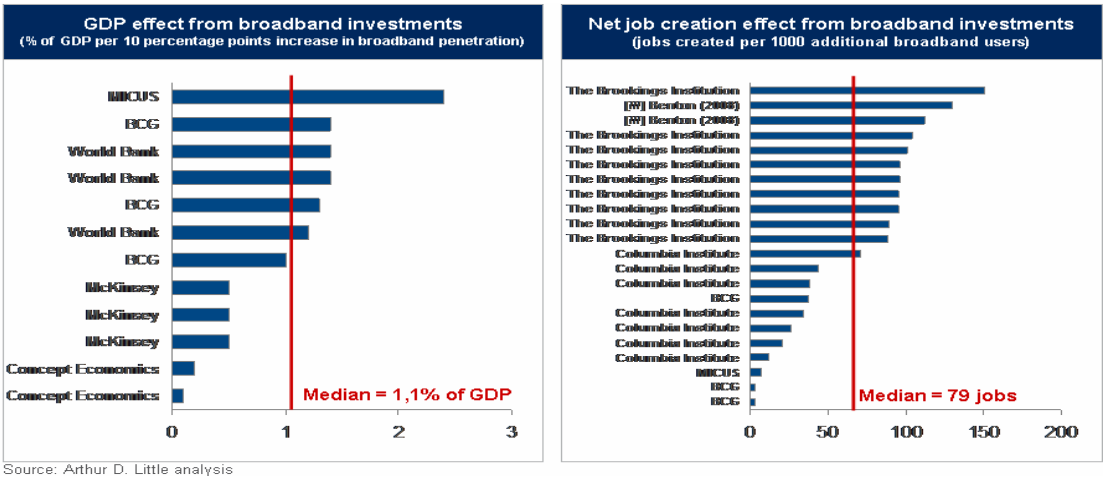
OCTOBER 2010

1. INTRODUCTION AND SUMMARY

LM Ericsson ("Ericsson") welcomes the opportunity to respond to ComReg's Consultation Paper on 800 MHz, 900 MHz and 1800 MHz spectrum release (ComReg Document 10/71). In general, ComReg is to be commended for the excellent work it has done in resolving several complex issues relating to spectrum release within these bands and, in this respect, ComReg deserves recognition for its forward-looking approach to this difficult and multi-layered issue. That said, Ericsson is of the view that ComReg's proposals do not in every respect constitute the best way forward in relating to future use of this prime national asset and in this response we highlight the concerns we have in relation to some of ComReg's proposals where we also suggest alternative approaches that we feel would produce a better outcome for the country.

Ericsson is of the opinion that this is the most important consultation on wireless communications in the recent history of the State, in particular since the liberalisation of communications services began in the early- to mid-1990s. The decisions which ComReg must make now will have significant far-reaching and long-term impacts, socially as well as economically. The fact that these decisions will have to be made at a time of profound economic difficulties within the country creates the risk that short-term thinking may prevail to the detriment of the good of the citizens of Ireland. If ComReg makes the right decisions now, however, this could not only make an immediate positive contribution to our economic recovery but it should also ensure that Ireland has the best and most sustainable communications infrastructure across the country in the medium- to long-term.

In particular, research shows that for every 10 percentage points increase in broadband penetration the isolated economic effect on GDP growth is around 1% of GDP and for every 1000 additional broadband users, roughly 80 new jobs are created.[1] This is outlined clearly in the following diagram.



Source: Arthur D. Little analysis

[1] Source: Arthur D Little & Ericsson report on the socioeconomic effects of broadband investments.

In this context logic would dictate that a lower spectrum price with wider coverage and higher throughputs, which would support greatly increased penetration would be much more beneficial for the industry and state as a whole. It would be hard to argue that 95% availability of broadband with speeds between 20-95Mbs would not increase penetration by a much greater amount than 10%, with each 10% increase contributing approximatly 1.27 Billion Euro to our GDP based on 2009 figures.

Spectrum is one of Ireland's most valuable assets. Lower spectrum bands such as 800 and 900 MHz provide good geographical and in-building coverage, higher spectrum bands such as 1800 MHz and 2100 MHz are excellent for capacity but not very good at penetrating buildings or covering larger areas as the signal in these higher bands degrades more quickly. Hence 3G coverage is more problematic in buildings and coverage is not as widespread in rural locations. Spectrum availability for advanced mobile broadband services in 900 and 800 MHz has the power to drastically change this.

In particular, spectrum in the 800 and 900 MHz bands is essential to the provision of cost-effective coverage in rural areas. One of the reasons that the GSM (2G) standard was so successful is that the regulators across Europe had the foresight at the time to ensure that the first GSM licences were issued to operators using spectrum in the 900 MHz band and that these licences had high coverage conditions (typically 90%+ geographic). Governments and regulators realised (correctly) at the time that if they did not have these high coverage figures there was a significant danger that operators would simply cherry-pick and roll out their networks in the most populous areas to the detriment of wider economic and rural activity.

In its Consultation Paper, ComReg is proposing a 70% population coverage obligation. Ericsson strongly believes that such a target is wholly inappropriate for the following reasons:

- It fails to maximize the potential economic impact that the delivery of broadband in this spectrum could achieve.
- These bands are the only bands where high levels of coverage are economically viable.
- It makes no logical sense for coverage conditions to be lower in these bands relative to the higher bands, e.g. 3G services that have been licensed in the 2100 MHz band. In fact if anything it should be the other way around, with more stringent coverage obligations applying in the lower bands and more relaxed coverage obligations in the higher bands.
- There is a real danger that in the longer term operators may be forced to reduce their coverage from the current 99%+ level we currently enjoy, down to a level at or close to 70% of the population. This is

because mobile operators in Ireland could well experience difficulty in securing access to scarce capex resources given that the financial returns to be made from such investment are significantly better in higher growth markets overseas.

- Such an outcome could lead to market failure and the resulting necessity to expand the National Broadband Scheme (NBS) from its current 10% demographic to one as high as 30% with consequent costs to the state.

With regard to a minimum broadband throughput, given the right licensing conditions these bands are capable of supporting average end user-speeds of between 20 Mbps and 95 Mbps today. In Ericsson's opinion, it makes no sense to have a minimum average user throughput less than that required by the NBS.

As a result, before it finalises its key decisions in relating to the release of liberalised spectrum in the 800, 900 and 1800 MHz bands, we believe that within the next 30 days or so it is imperative for ComReg to:

1) Re-examine and reference international experience (especially from other European countries) where liberalised spectrum usage rights of spectrum below 1GHz are being offered with more stringent rollout, coverage and throughput obligations attached;

2) Thoroughly investigate and publish the risks from a customer and national economic standpoint of operators choosing to provide reduced mobile coverage or service, absent any requirement on them to provide nationwide coverage;

3) Investigate the potential impact that overly lax coverage and quality of service obligations would be likely to have on the NBS, possibly leading to a widening of the NBS footprint to 30% with a consequent need for additional public funding (in circumstances where market failure can be shown to exist);

4) Thoroughly investigate alternative options, especially in the area of infrastructure sharing (including spectrum sharing) and how such options could be best calibrated so that maximum rollout occurs in the most economically efficient way while maintaining a highly competitive market.

For example, stepped coverage conditions e.g. licensed operators in the 800 and 900 MHz bands must provide at least 95% population coverage, of which 70% coverage must be provided by each operator by way of its own infrastructure. The remaining 25% can be provided by way of national roaming and or network and spectrum sharing.

In Commissioner Neelie Kroes' communication document "Digital Agenda for Europe" (at Annex 2) key performance targets have been set out which have been mainly drawn from the benchmarking framework endorsed by Member States in November 2009. In particular two broadband targets are very relevant to this consultation. i.e.

- Fast broadband by 2020: broadband coverage at 30Mbps or more for 100% of EU citizens. (Baseline: 23% of broadband subscriptions were at least 10Mbps in January 2010)
- Ultra-fast broadband by 2020: 50% of European households should have subscriptions above 100Mbps. (No baseline).

With Ireland's geographic population dispersion, wireless broadband has played a vital role in our keeping up with other countries in terms of broadband penetration. Indeed, ComReg itself has argued for wireless broadband to be included in European broadband benchmarking.

Used effectively the current release of spectrum proposed in the consultation could on the whole deliver the major part of these targets and Ericsson believes that for operators who acquire the maximum 20MHz of this valuable spectrum specifying a minimum average throughput network standard of 4 Mbps by 2015 rising to 8 Mbps by 2020 would be a reasonable and proportionate obligation for licensed operators to have to take on in return for acquiring exclusive access rights to of spectrum in the 800/900 MHz bands. A proportionally average throughput network standard of 2 Mbps by 2015 rising to 5 Mbps by 2020 would, similarly, be a justifiable obligation to impose on the 800/900 MHz operators.

In summary, Ericsson believes that ComReg has done an excellent job in resolving several complex issues relating to spectrum release within these bands and, in this respect, ComReg deserves to be commended for its forward-looking approach to this difficult and multi-layered issue. Should the resolution of the issues we have outlined and identified in this response be proposed, we think that ComReg will have done an exemplary job of one of the most complex and important consultations it has undertaken to date.

2. RESPONSES TO CONSULTATION QUESTIONS

In this section, we provide responses to each of the consultation questions posed by ComReg in its Consultation Paper.

Q. 1 ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg's proposal? Please provide reasons for your view.

Yes. As ComReg points out, the Annex and Recitals to the EC 800 MHz Decision[2] suggest a preference for the use of Frequency Division Duplex (FDD) mode of operation within the 800 MHz band in line with recommendations for doing so that have been made by CEPT. It is also the case, as ComReg notes, that a number of EU Member States have already chosen an FDD band plan arrangement when providing access to the 800 MHz band within their jurisdictions. For these reasons, Ericsson supports ComReg's proposal that new electronic communications services (ECS) deployed in the 800 MHz band in Ireland should employ FDD mode of operation.

Q. 2 ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg's proposal? Please provide reasons for your view.

Yes. Given that ComReg is proposing to adopt the band plan for the 800 MHz band suggested by the Annex and Recitals to the 800 MHz Decision, it makes perfect sense for it also to adopt the block edge masks (BEM) proposed in the Annex to the same Decision.

Q. 3 Do you agree with ComReg's proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. As ComReg points out, the 800 MHz and 900 MHz bands offer broadly similar propagation characteristics and in the medium term are capable of supporting the same kinds of mobile broadband services. As a result, the two bands are close substitutes and so it makes sense from the point of view of efficient spectrum management to award access to both bands at the same point in time. Such a joint award would also, as ComReg rightly

[2] EC Decision 2010/267.

acknowledges, have significant benefits for consumers as it will give operators the opportunity to deploy more advanced mobile broadband networks and the award of such a significant amount of spectrum is likely to eliminate any danger of wide scale consumer disruption during the period when adjustment and retuning of existing spectrum allocations takes place.

Q. 4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. Ericsson agrees that the 1800 MHz band could be viewed as a very attractive capacity band by both existing operators and new entrants, in terms of planning for future expansion of network capacity or in augmenting assets won in the 800 or 900 MHz bands at auction.

As ComReg points out, the 1800 MHz band is emerging as an important band for the deployment of LTE services, with a number of operators in Europe and elsewhere having already publicly stated that they intended to launch exploratory LTE services within this band. As a result, it makes sense for ComReg to provide for future access to the 1800 MHz band at the same time that it proposes to do so for the 800 MHz and 900 MHz bands.

Q. 5 Do you agree with ComReg's Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

Yes. ComReg's proposal to extend the existing GSM licences held by O2 and Vodafone from May 2011 until the expected date (in early 2013) upon which there will be availability of liberalised 800 MHz and 900 MHz spectrum makes sense from the point of view of practicality and the efficient management of spectrum resources generally. While the Interim Licence Proposal pushes back the date for spectrum liberalisation in the 900 MHz band, this is balanced by the availability of both the 800 MHz and 900 MHz block on a liberalised basis at the same time in early 2013.

Q. 6 Do you agree with ComReg's proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

Ericsson has no comment to make in relation to this proposal.

Q. 7 Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg's statutory functions, objectives and duties.

Ericsson has no comment to make in relation to this issue.

Q. 8 Do you agree with ComReg's proposal to set a sub-1GHz cap for the competition? Please provide reasons for your view.

Yes. As ComReg points out, there was general consensus amongst respondents to ComReg's original proposal for a sub-1GHz cap of 10 MHz to be put in place for its planned 900 MHz auction. As ComReg also states, operators who fail to secure access to sub-1 GHz spectrum would have to deploy a larger number of cell sites in order to provide wide-area coverage compared to operators who have secured sub-1GHz spectrum allocations. Such an outcome could have negative consequences on retail mobile competition and so it is reasonable for ComReg to put in place a sub- 1GHz cap in order to prevent such an undesirable outcome.

Q. 9 Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

It is not clear that the most appropriate solution for a cap in spectrum sub 1GHz is 20MHz across both bands. ComReg has to balance the need to make sufficient spectrum available to all potential operators with a requirement to ensure that the proposed cap does not overly restrict the amount of spectrum an individual operator can bid for while ensuring that competition is maintained. While the proposal to set the cap at 2 X 20 MHz appears to strike a fair balance between these competing needs, ComReg should note that unlike the 900 MHz band, the 800MHz band will be unencumbered with legacy GSM services and also that, in the short- to medium–term, more advanced devices and equipment will be available in the 800 MHz band before equivalent 900 MHz devices and equipment come on stream. It is possible, therefore, that if one operator were to secure usage rights to 20 MHz of the 30 MHz on offer in the 800 MHz band, that that operator could gain an unfair competitive advantage over all other market players. It could be argued that setting a 10MHz cap per band and while allowing and supporting spectrum sharing could result in a better outcome overall.

Q. 10 Do you agree with ComReg's proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Ericsson has no firm position in relation to this issue. Arguments can be made for and against beauty contests and auctions as a way of the state getting the maximum societal and economic benefit from assigning usage rights to access this scarce national resource. Ultimately it is for the regulator to decide based on government policy objectives.

Q. 11 Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view.

Yes. Although this approach – as ComReg admits – would add complexity to the process (by the introduction of a second temporal lot) it would also allow bidders to pursue more refined bidding approaches and, hence, would be likely to result in a more efficient allocation of spectrum amongst bidders.

Q. 12 Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

Ericsson does not wish to offer any opinion in relation to this proposal.

Q. 13 Do you agree with ComReg's proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

No. As ComReg itself admits, its advisers DotEcon are of the view that the amount of spectrum on offer in a combined 800/900 MHz auction is sufficiently large to discourage collusive behaviour, as it would be "more challenging" for bidders to co-operate in a way that would produce an anti-competitive outcome. Based on this viewpoint, DotEcon take the view that, in setting the minimum price for spectrum blocks in the auction, ComReg should "err on the side of caution". Arising from the benchmarking exercise they undertook for ComReg, DotEcon stated that the minimum price for 2 X 5 MHz blocks of liberalised spectrum should be set at the bottom end of an €18 million - €26 million range.

ComReg has, however, proposed that the minimum price should be set at €25

million per spectrum block and it justifies this higher price because it says it "remains concerned" about possible collusive behavior amongst bidders, despite the fact that its advisers have stated that any such bidding strategies are unlikely to produce the desired anti-competitive outcome. ComReg fails provide any detailed reasoning to support its concerns about possible collusion amongst bidders or explain in any detail about the circumstances in which "a quick tacit understanding" amongst bidders is likely to emerge or how such an understanding could, contrary to DotEcon's analysis, prove effective in producing a collusive outcome. As a result, it is not clear why ComReg has proposed a minimum price of €25 million per spectrum block when its advisers have said it should be set at the bottom end of an €18 million - €26 million range.

Ericsson shares DotEcon's view that it is best to err on the side of caution in setting the minimum price. Mobile operators in Ireland face a very challenging environment in which to produce investment plans for additional network deployment and there is a real risk that, by setting the reserve price in the auction at too high a level, ComReg will choke off demand for the liberalised 800/900 MHz spectrum. Such an outcome would be extremely detrimental to the development of the communications sector within the country, with mobile broadband networks being deployed less widely than might otherwise be the case. In these very uncertain economic times, ComReg should be doing whatever it can to promote new network investment and setting the reserve price in the auction at the level that its advisers DotEcon have recommended would be a sensible first step in this regard.

Finally, solid research shows that for every 10 percentage points increase in broadband penetration the isolated economic effect on GDP growth is around 1% of GDP and for every 1000 additional broadband users, roughly 80 new jobs are created.[3] In this context logic would dictate that a lower spectrum price with wider coverage and higher throughputs, which would support greatly increased penetration would be much more beneficial for the state. It would be hard to argue that 95% availability of broadband with speeds between 20-95Mbs would not increase penetration by a much greater amount than 10%. Each 10% increase would contribute 1.27 Billion Euro to our GDP.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

Ericsson does not wish to offer any opinion in relation to this proposal.

[3] Source: Arthur D Little & Ericsson report on the socioeconomic effects of broadband investments.

Q. 15 ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market.

Do you agree with ComReg's proposed coverage and roll-out obligation? Please provide reasons for your view.

No. Ericsson does not support ComReg's proposal for a symmetric coverage obligation and asymmetric roll-out timeframes, depending on whether or not the licensee is an existing operator or a new entrant. In addition, Ericsson does not agree with ComReg's proposed coverage and roll-out obligation.

Ericsson does not believe that symmetric coverage obligations and asymmetric roll-out timeframes are the best way to promote maximum rollout within a reasonable timeframe by both existing market players and new entrants. If an entrant does not achieve widespread coverage within a short period of time, it is unlikely that that operator will gain sufficient traction within the market to thrive (or, indeed, to survive) with the result that the proposed coverage obligation (as it relates to a new entrant) could well produce a weak market player, one that would struggle to have any positive competitive impact. Providing such an operator with a longer timeframe to meet the proposed modest coverage requirement of 70% of the population is unlikely to be of any benefit, either to the operator or to consumers as it simply delays the completion of nationwide rollout for several years and means that the new operator could continue to have an inferior network footprint compared to established players for several years.

The conditions that were attached to previous mobile licences are useful in assessing what approach would be best to adopt in relation to the licensing of 800/900 MHz communications services. In this regard, it should be recalled that the 2G mobile licence issued to the new entrant in 1996 (then Esat Digifone, now O2) contained extremely challenging obligations in relation to population and geographic rollout. The entrant's success in meeting these targets, however, was one of the critical success factors in the take-off of 2G mobile services within the country and is largely responsible for Ireland enjoying one of the best geographic and demographic 2G coverage footprints in Europe. Due to the speed of Esat Digifone's rollout, the then incumbent mobile player (Eircell, now Vodafone) was forced to follow suit, with the result that competitive nationwide 2G mobile coverage was attained in a very short space of time.

In contrast, the 2G licence issued to Meteor and the 3G licences that were issued to O2, Vodafone and 3 Ireland in 2002 (with Meteor being granted its 3G licence more recently) contained far less stringent coverage and rollout obligations. Although the slow speed of 3G rollout in Ireland over the past decade has also been due to other factors, the absence of nationwide

coverage targets was an important factor in the slow deployment of 3G networks by all of the operators, just as it was in the slow build-out of Meteor's 2G network.

Ericsson fears that similar issues could arise in relation to services provided over 800/900 MHz if ComReg does not oblige the operators to do otherwise. Just because this spectrum is suitable for providing mobile broadband services on a nationwide basis does not mean that the operators will roll out nationwide networks if they are not obliged to do so. All mobile operators will, naturally, concentrate their efforts on the provision of coverage in cities and towns and only once they have completed rolling out services in these areas will they consider (if they do so at all) extending their network reach into rural areas.

As a result, spectrum liberalisation in the 900 MHz band and the joint award of liberalised spectrum in the 800 MHz and 900 MHz bands will prove little use over the medium term in bridging the Digital Divide and providing advanced mobile broadband services to customers in rural and remote parts of the country. With the mobile operators not obliged to provide any coverage in excess of the extremely modest 70% population target, it is unlikely that the operators will make any effort to go beyond this target. It is at least arguable that the same outcome would have occurred in relation to the availability of 2G mobile services had the mobile operators not been obliged to offer full nationwide coverage within a short timeframe.

An outcome whereby liberalised 800/900 MHz communications services do not have to extend beyond 70% coverage could have serious detrimental effects over the medium term.

In time the mobile operators will move to completely decommission their 2G equipment and if they choose not to replace this with network infrastructure providing liberalised communications services (e.g. voice, text and advanced data services) using their 800/900 MHz spectrum allocations, then their existing coverage footprints could shrink significantly compared to their existing 2G footprints. While ComReg might view such a scenario as unrealistic, it needs to be strongly emphasised that under ComReg's proposals, this potential decision means that operators will only be obliged to provide 70% population coverage which exposes Ireland to the grave risk that over time, coverage could shrink back down to this level which would result in broad swathes of the country being deprived not only of advanced mobile broadband services but also potentially of basic mobile voice and text as well.[4]

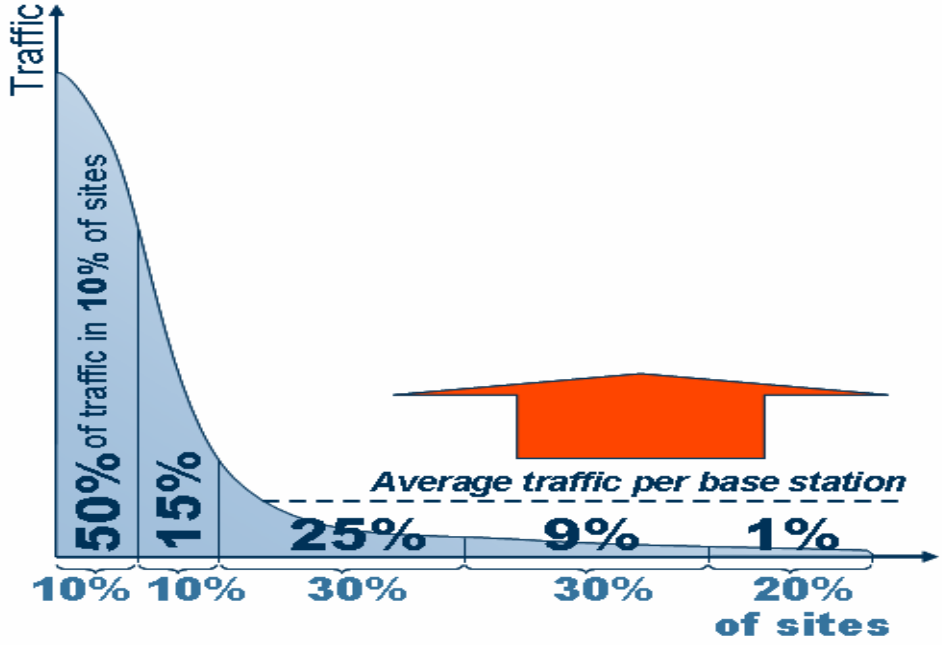
Ericsson believes that such a scenario is entirely credible, with the mobile operators weighing up the cost of replacing their existing 2G infrastructure

[4] Although mobile coverage is currently very widespread, this has not, as ComReg will be aware, prevented the voicing of critical political comment about current coverage levels. See report on Joint Oireachtas Committee discussion concerning mobile coverage at: http://www.irishtimes.com/newspaper/breaking/2010/1006/breaking28.html

with the likely revenues to be gained from traffic generated in rural and remote areas over the replacement equipment. It is easy to imagine a situation whereby the operators will take the view that investment in such replacement infrastructure does not make economic sense for them.

Figure 1 below illustrates the relationship (at a pan-European level) between the number of mobile cell sites and the volume of traffic that is carried over these sites. As Figure 1 shows, on average approximately 50% of cell sites across Europe carry only 10% of traffic. Given this statistic, it is not at all unrealistic to imagine that, as mobile ARPUs continue to decline, it will become increasingly more difficult for operators to justify providing rural coverage in the knowledge that the cell sites deployed will only ever carry a very small percentage of the operators' traffic.

Figure 1: European mobile traffic and cell sites



Source: Ericsson European network statistics report

It is also the case that, even if the mobile operators' Irish operating units want to proceed with the required investment to ensure that nationwide coverage for liberalised communications services in the 800/900 MHz band is achieved, it needs to be recognised that all the Irish market players are subsidiaries of multinational operators. As a result, the Irish operations of these companies are, in effect, in competition with other operating units overseas for scarce capex resources.

In such circumstances, it is likely to prove difficult for the Irish operators to make a compelling case to their parent companies for the kind of investment funds they would need to roll out 800/900 MHz networks to support the

provision of liberalised communications services of on a nationwide basis. Such difficulties are likely to be significantly ameliorated, however, in circumstances where companies' Irish operations face licence obligations requiring them to do so.

It is instructive to contrast ComReg's proposals with the recent award of 800 MHz spectrum in Germany. This provides an insight into how other jurisdictions are approaching the aim of reducing the digital divide and the best use for the lower band spectrum assets and shows how ComReg could usefully adopt the same kind of policies to further this aim in Ireland.

In Germany operators who are awarded spectrum in the 800MHz band must first cover rural areas where there is presently no broadband coverage at all (the so-called 'white spots'), before then covering other undersupplied areas. It is only after these areas have been covered that the 800 MHz operators will be allowed to extend their network footprint to cover densely populated areas. In this way, Germany plans to extend mobile broadband coverage to 90% of its population by 2016.[5] While the eventual implementation of the license may be imperfect (operators can apparently focus on cities and towns in the defined rural areas as the drafting of the text has some weaknesses), in terms of achieving the aim of rural coverage the principle is in our opinion correct.

The UK has also decided to use the assignment of usage rights in the 800 MHz band to help near universal access to mobile broadband services. In May 2010, the UK Government announced that it intended to issue a direction to the UK regulator Ofcom in relation to a number of issues pertaining to the auctioning of access rights to the 800 MHz spectrum in that country. In this regard, the UK Government decided that Ofcom should be directed to apply coverage conditions, which it set at 99% of the UK population, to two 2 X 5 MHz blocks of spectrum in the 800 MHz band.[6]

In Sweden, the regulator PTS recently issued an open invitation to parties wishing to secure access to the 800 MHz band and, in doing so, set out coverage obligations to which operators providing mobile broadband services in the band must comply. Included in this is a requirement for the 800 MHz licence holders to provide service to homes and businesses that currently lack broadband and which have been so identified by PTS.[7]

Ericsson believes that there is no impediment to ComReg if it decides to follow the kind of enlightened approaches adopted in Germany, the UK and Sweden. ComReg can, by obliging 800 MHz operators to make their mobile

[5] For a discussion on the terms under which the 800 MHz spectrum was made available in Germany, see *The digital dividend auction in Germany - will operators be more prudent this time?* Christoph Wagner, Hogan Lovells for Lexology.com available at: http://www.lexology.com/library/detail.aspx?g=cb1d269e-a8a2-49e1-8bf2-5d2ac5e976bc

[6] *Digital Britain Report: Government Response to the Consultation on a Direction to Ofcom to Implement the Wireless Radio Spectrum Modernisation Programme*, Department for Business Innovation and Skills, March 2010, Para. 88.

[7] See *Open invitation to apply for a licence to use radio transmitters in the 800 MHz band*, PTS, 7 September 2010, Section 2.9.

broadband services available to end-customers on a nationwide basis, ensure that the 800 MHz assignment process is used to help boost universal access to broadband services generally within the country.

Without such measures being taken, it is all but certain that operators granted access to 800 MHz spectrum blocks will not roll out nationwide networks. In this regard, it is also likely that a failure on the mobile operators' part to roll out nationwide mobile broadband networks will have a detrimental impact on the NBS, under which the Government provides funds for the provision of 3G-based mobile broadband services using spectrum in the 2.1 GHz band.

In the scenario where coverage is reduced as a result of lower coverage conditions, the NBS would have to be expanded (albeit only after a lengthy process proving market failure). It would make far more sense to provide such services using the 800/900 MHz bands: indeed, by deploying LTE technologies, operators would be in a position to provide much more advanced and higher speed mobile broadband services in these areas than is currently available over the 2.1 GHz band.

If operators are not obliged to roll out nationwide networks in the 800 and 900 MHz bands, however, it is difficult to imagine why the NBS operator would, absent further funding to help it do so, swap out the existing 3G equipment it uses to provide these services for the infrastructure necessary to provide more advanced services in these areas. As a result, customers in NBS areas are likely to be further disadvantaged in the area of access to faster broadband services compared to customers in urban areas.

Ericsson believes that there is still time for ComReg to pursue a different approach to the nationwide rollout of advanced mobile broadband infrastructure, one that will ensure that networks are rolled out with economic efficiency to the maximum extent possible. Ericsson believes that this could be achieved by a mixture of higher coverage obligations, while allowing operators meet these coverage requirements through national roaming, shared network infrastructure and/or coverage in other bands.

Ericsson believes that a more appropriate coverage obligation for services deployed using 800/900 MHz spectrum would be the 90% geographic target that ComReg originally proposed in relation to the deployment of liberalised services in the 900 MHz band. Such a target still falls slightly short of current coverage levels in relation to 2G services provided over the 900 MHz band but such a target would ensure that virtually the entire population of the country would be able to access advanced mobile broadband services.

Ericsson accepts that it would not be economically feasible for every licensed operator to roll out a separate nationwide 800/900 MHz network. Instead, we believe that ComReg should actively facilitate Radio Access Network (RAN) sharing between operators but only after an intermediate economically feasible coverage target has been met. Based on Figure 1, Ericsson believes this mandatory own-network coverage target to be somewhere between 50-

80% population coverage.

Above this mandatory own-network coverage target, ComReg should – perhaps in conjunction with colleagues in the Department of Communications, Marine and Natural Resources (DCENR) who are responsible for the operation of the NBS – draw up specific service zones within the country where active equipment or spectrum sharing would be allowed. Such zones would be the more rural and remote parts of the country and, perhaps like in Germany, operators must have coverage in these zones before they can be commercially active in the other zones thus reducing the danger that the mandatory own-network build happens first with rollout to remote areas only afterwards so rural areas come off second best from such a rollout approach.

Q. 16 ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.

Do you agree with ComReg's proposed quality of service obligations? Please provide reasons for your view.

No. Ericsson does not support ComReg's proposal not to set a minimum quality of service (QoS) standard for a mobile broadband service provided using the 800/900 MHz spectrum band.

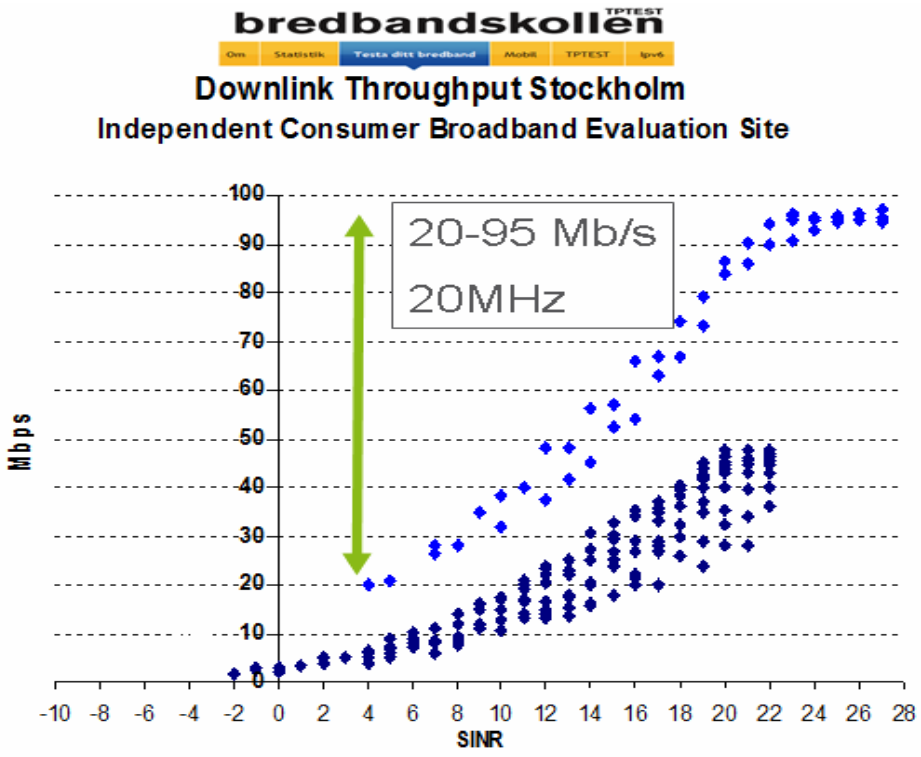
ComReg justifies its position in not proposing a minimum QoS in this area due to the fact that mobile broadband customers should be in a position to establish for themselves (in a way that they cannot do for voice calls, as this involves the quality of the network being used by the other participant on the call) the operator that is responsible for the poor service and, as a result, to take appropriate action. ComReg concludes that the "risk of market failure associated with the provision of a broadband service is less than that associated with the provision of a voice call service".[8]

While Ericsson doesn't necessarily disagree with ComReg's reasoning as set out above, we are concerned that its analysis may be in danger of missing the point somewhat. Ericsson is of the strong opinion that this prime sub-1GHz spectrum is an important national resource and that operators who gain exclusive access rights to it must, at the same time, also take on obligations in relation to minimum levels of service provided across the liberalised 800/900 MHz networks.

[8] Consultation Paper, Section 4.6.4.

In previous consultations, Ericsson suggested a mandatory minimum throughput of 2 Mbps with little or no resistance from other interested parties. As Figure 2 below shows, however, users of the world's first commercial LTE network are already enjoying data speeds that are considerably higher than this. Based on this market experience, Ericsson believes that for operators who acquire the maximum 20MHz of this valuable spectrum specifying a minimum average throughput network standard of 4 Mbps by 2015 rising to 8 Mbps by 2020 would be a reasonable and proportionate obligation for licensed operators to have to take on in return for acquiring exclusive access rights to of spectrum in the 800/900 MHz bands. In addition, a proportionally average throughput network standard of 2 Mbps by 2015 rising to 5 Mbps by 2020 would similarly be justifiable.

Figure 2: Throughput speeds experienced on LTE in Sweden



Source: Ericsson/Bredbandskollen

Q. 17 ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.

Do you agree with ComReg's proposed miscellaneous obligations? Please provide reasons for your view.

Yes. These obligations deal with a range of standard, non-controversial issues and ComReg's proposal to include them in operators' licences looks sensible.

Q. 18 Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

Yes. ComReg has clearly adopted a cautious approach in determining the timeframe that operators will need to transition to their new liberalised-use licences in the period from the proposed joint award of spectrum in mid-2011 until the date on which the liberalised 800 MHz spectrum becomes available in early 2013. As ComReg notes, the timescales proposed are based on worst-case scenarios set out in the joint technical report prepared by its advisers Red-M and Vilicom and that the mobile operators are likely to do whatever they can to address whatever transitional issues arise.

Q. 19 Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

Yes. As ComReg states, it is unlikely that any transitional issues will arise between times slices in the 800 MHz and 900 MHz band and its proposal to use an industry-led approach to deal with resolving whatever issues might possibly arise is a sensible and proportionate one.

Q. 20 Do you agree with ComReg's proposal to issue 'preparatory licences' to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. As ComReg notes, all successful bidders for liberalised-use spectrum in the 800 MHz and 900 MHz bands will have to prepare for the commencement of services in early 2013. Given the amount of preparatory network deployment work and associated testing that will need to take place in advance of this date, it would therefore be both sensible and appropriate to issue all 800/900 MHz operators with 'preparatory licences' which would be valid from shortly after the conclusion of the licence award process and operate until the commencement date of the new liberalised-use licences.

4 ESB Networks

Comreg. Consultation on 800MHz, 900MHz & 1800MHz spectrum Release

(Document Number 10/71)

ESB Networks Response

Status: **Approved**

Date: **28/10/2010**

ESB Networks Response to ComReg Consultation Paper

800MHz, 900MHz & 1800 MHz spectrum Release (Document Number 10/71)

1. Introduction & Proposal Summary

ESBN welcomes this opportunity to respond to ComRegs' consultation paper and provide an input into the process for planning the liberalisation and issuing of new liberalised licences for the 800 MHz, 900MHz and 1800 MHz bands.
ESBN notes ComReg's views on the principles in implementing the release of the 900MHz band including that these will be technology and service neutral licences.
ESBN also notes that combining the release of the 'freed up' 800MHz band with the newly liberalised 900 MHz band makes available 130MHz of sub-1 GHz spectrum.

Electricity networks are a vital national infrastructure that support economic development and enable supply of electricity to all customers which is an essential service. Electricity networks are fundamental to the delivery of EU and national sustainability targets.

Key National Sustainability Targets include

1. Supply 40% of the Electrical Energy on the island from Renewable sources both at a macro and micro level.
2. Contribute to an overall reduction in energy usage of 20%.
3. Significant improvement in energy efficiency.
4. Comply with the EU directive in relation to smart metering.
5. 10% of car transportation to be fuelled through electricity

These targets will be enabled by a strong electricity system with ubiquitous embedded intelligence supported by a dedicated, reliable, secure and economic telecommunications infrastructure with adequate bandwidth. This evolution is sometimes described as smart networks or smart grid.

In particular smart metering and smart grid services to at least one third of the population can only be delivered using wireless technology.

Based on the work carried out to date in examining currently available communications technologies in the context of The National Smart Metering Plan, Phase 1 Technology Trials we believe that currently available wireless technologies are far from ideal in terms of performance, total cost of ownership and control. As Comreg is no doubt aware control is a key issue in the context of a vital national infrastructure.

It is imperative therefore that ESBN is able to access sufficient spectrum to deploy telecommunications systems to continue to carry out its functions in a safe, efficient

and effective manner and to meet emerging smart metering and smart network requirements.

On the basis of this therefore, ESBN is putting forward the proposal that a dedicated 10MHz of the available 130Mhz spectrum in the sub 1GHz band should be put aside as a critical infrastructure asset for communications to support the Electricity Sector. This will be available to the Electricity industry to enable Smart Networks to support the long term requirements of the energy industry, its customers and the state. This network will facilitate safety, security of supply, energy efficiency and consumer choice through the provision of timely and accurate information, real time communications with the meter and home and it will facilitate the adoption of distributed generation from renewable sources.

2. ESBN Proposal

It is opportune that this consultation and liberalisation process should occur at this time as ESBN have just completed the technology trials assessing the suitability of the existing communication standards available for the utility to deliver the requirements for the Smart Metering of the future as outlined above. However the trials showed that current technologies appear inadequate to give the reliability required at an acceptable cost, it is therefore important for ESBN to outline its proposal. Furthermore the use of a third party's network such as GRPS presents further issues for ESBN if it were to be used in large numbers of meters where the system will be expected to have a lifetime of at least 15 years. There issues include – mobile network operator lock-in, long term support of the technology and total cost of ownership.

Furthermore ESBN believes it can best fulfil its role with least risk to all electricity customers by controlling the communications infrastructure. This is in line with most smart metering deployments to date around the world.

Smart grid will place even more responsibility in terms of reliability, security and safety on telecommunications infrastructure. These responsibilities can best be delivered through an ESBN controlled communications infrastructure.

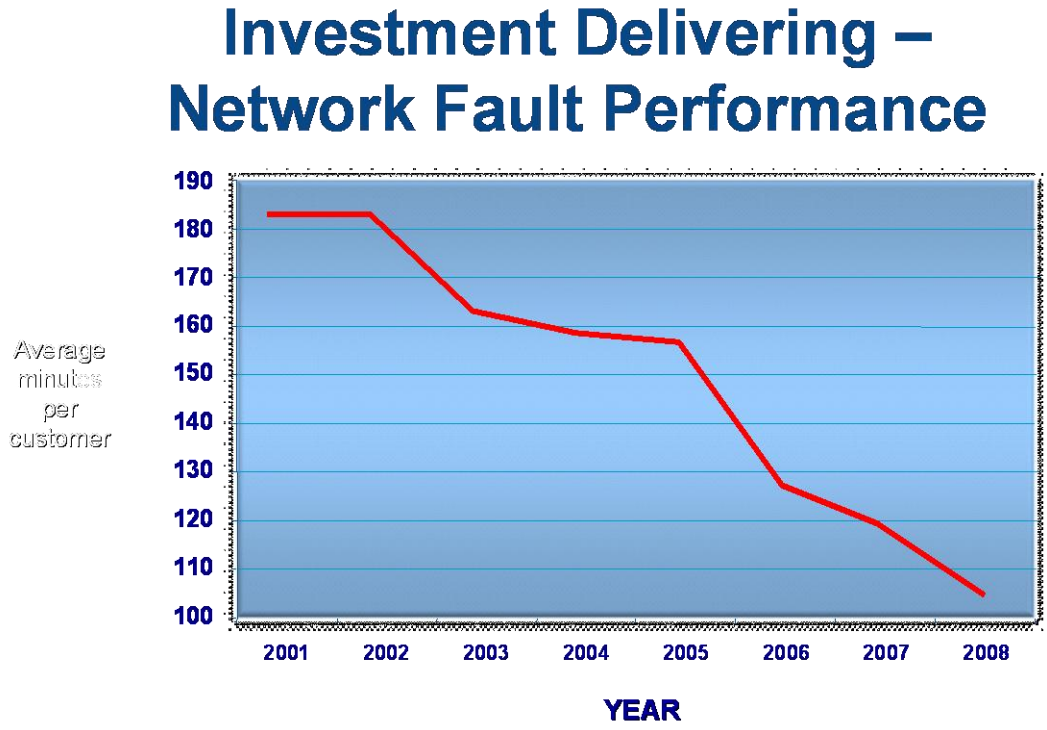
This proposal, to set aside 10MHz of the available 130Mhz spectrum in sub 1GHz band as a critical infrastructure asset for communications to support the Electricity Sector, meets several of the criteria outlined by ComReg in its strategy for the management of Spectrum in Ireland.

- It provides for innovative technologies and services
- It maximises the economic and social returns from the use of radio spectrum;
- It ensures the efficient use of scarce radio spectrum resources;

3. Background

3.1 Smarter electricity networks:

Ireland's electricity system is currently built and operated to the highest international standard. The quality of the electricity system and the ability to deliver a safe and reliable electricity supply has been a significant enabler in building the country's economy during the era of high electricity growth rates. During that time the essential focus was to deliver the additional capacity required to meet the fast growing demand where the load increased by a factor of 50 % over a 10 year period. In addition to reinforcing the network during this time, the ESBN networks also extended the utilisation of telecommunications through various means the combination of the investment in the networks and the availability of telecommunications to support this resulted in significant returns on continuity performance for customers as can be seen in the graph below.



The targets that have been set for renewable generation are the highest in the world. Ireland's island system with limited interconnection this makes it even more challenging. An additional unique aspect of the planned renewables in Ireland is that almost 50% of the wind generation capacity will be comprised of a large number of smaller windfarms connected to lower voltage levels of the electricity network. This requires increased protection and system management for most of the network that was previously required just for the relatively small transmission system. To put this in scale, there are 6500KM of high voltage transmission lines on the system while there are 160,000KM of lower voltage distribution network.

In order to maximise the benefits of the clean wind resource available on the island, the government has set a target to have 10% of electric cars supplied by clean electricity resource by 2020.

3.2 Smart Metering

The National Smart Metering Plan is a commitment in the Government's Energy Policy Framework and in the 2007 Programme for Government. It is a central component of the strategy to radically enhance management of energy demand and to deliver greater energy efficiency. Smart metering is believed to be one method which encourages the self regulation of energy consumption. This commitment was reiterated in the Government's framework for sustainable economic renewal, Building the Smart Economy, published in December 2008. On 8th May 2009, the Government adopted the National Energy Efficiency Action Plan 2009-2020 (NEEAP) in order to achieve Ireland's energy efficiency targets. One of the principal measures contained within this Action Plan, which represent the key targets for Government to achieve to meet our 2020 commitments, is Action 33:

"We will encourage more energy-efficient behaviour by householders through the introduction of smart meters." The Commission for energy Regulation established the Smart Metering Project Phase 1 in late 2007 with the objective of setting up and running Smart Metering Trials and assessing their costs and benefits, which will inform decisions relating to the full rollout of an optimally designed universal National Smart Metering Plan

The goals of the Smart Metering Programme are to:

Encourage Energy Efficiency

- Encourage end-use energy efficiency via enhanced information and pricing signals, resulting in reductions in overall energy usage and thus reduced emissions of carbon dioxide (CO2), nitrogen oxides (NOx) and sulphur oxides (SOx) as a measure to combat climate change and reduce pollution.

2. Facilitate Peak Load Management

- Reduce demand for peak electrical power, with consequential electricity generation savings and improved security of supply. This can be achieved via pricing signals such as Time of Use tariffs, where the price of electricity varies at different times of the day to reflect the changes in the costs of producing electricity.

3. Support Renewable and Micro Generation

- Assist in achieving of Ireland's stated national targets for renewable electricity generation (40% by 2020) by facilitating demand response solutions that will complement increasing levels of intermittent wind generation on the electricity system.
- Facilitate the wider take up of micro generation.

4. Enhance Competition and Improve Consumer Experience

- Promote competition by enabling suppliers to offer more innovative products to consumers, particularly in the electricity retail market by enabling suppliers to create innovative pricing arrangements that can be offered to consumers to support the efficient use of electricity, such as Time of Use electricity tariffs.
- More accurate billing of consumers with the elimination of estimated billing except in exceptional circumstances.
- Support more timely and efficient change of supplier process for consumers.
- Support more flexible and diverse service offerings to consumers from suppliers including potential for expanding prepayment offerings.
- Empower consumers to make better decisions regarding their energy use by providing them with accurate, detailed and more frequent information on their energy consumption and costs.
- Support any specific needs of vulnerable consumers to ensure they can reap the benefits of smart metering.

5. Improve Network Services
   - Improve services to consumers, particularly in areas such as meter reading, fault monitoring and electrical power quality.
   - Significantly improve theft prevention and measure losses more accurately.
   - Become a key component of a 21st century smart electricity network for Ireland.
   - Continue to review the potential for smart metering to provide a platform to support national targets on Electric Vehicles
   - Improve network planning and electricity load forecasting, possibly leading to deferment of electricity infrastructure expansion costs in particular.

6. Review and Realise Synergies
   - The electricity smart metering infrastructure may also be used as the communications infrastructure with the electricity meter acting as the HUB to support smart metering for the one third of homes in the country with mains natural gas. Furthermore, CER continues to review with relevant government departments any potential synergies that may exist between the required energy smart metering infrastructure and water metering.

4. Telecommunications for Electricity Networks.

4.1 The 'Adaptive Electricity Network'

International research, commencing with the EPRI Intelligrid publications of 2004, promote the need for the electricity distribution industry to recognise the changing needs of a 21st Century digital society and better tailor power network safety, quality and reliability to align with their expectations.

More recently these discussions have expanded to include consideration of the benefits derived from embedded generation and demand management (energy efficiency). Electricity distribution companies have been at the forefront of SCADA and System Protection technology in the monitoring, control and management of their transmission and sub-transmission networks (including substations) for some time.

To meet the expectations of today's customers the industry recognises the need to extend this functionality beyond the high voltage network and substation boundary to encompass the broad geographical spread of their distribution and customer networks. The concept of a "smart, self-healing grid" is gaining momentum as the way to satisfy future customer expectations in an efficient way – but it is reliant on distributed intelligence and pervasive communications.

Considerable telecommunication investment will be required by the electricity industry over the next 10 years to meet the requirements of an adaptive electricity network. To meet this goal effectively requires a strategic and systematic approach and stability and certainty in terms of telecommunications systems and choices.

ESBN has at its disposal a relatively high capacity backbone telecommunications system comprised of Microwave Radio and Optical Fibre facilities. True to the traditions composition of utility telecommunications networks this backbone and associated secondary links maps closely the transmission and distribution systems.

Last mile systems in traditional terms consisted of links to HV stations comprised of a variety of point solutions including, low capacity point to point links, licensed point to multipoint links, own cable and MNO GPRS connections. However the number of these is small and the quality varies.

In the changing environment driven by the requirements outlined above a more comprehensive and holistic last mile solution is required. This solution is needed to meet these requirements has several components, key among these is a last mile solution,

4.2 Last Mile Communications and Experience from Technology Trials in Ireland.

There are a number of key technologies available which would, if proven effective provide a solution to ESBN's needs for a reliable, effective and cost efficient last mile solution. These include

- LV Power Line Carrier
- RF Mesh Solutions
- Mobile Network Operator services

The LV power line carrier solution is the leading technology in Europe for the provision of last mile communications to facilitate the intelligent edge to the consumer location. This technology has several advantages in that it is well standardised, it is accepted as a technology of choice among a number of large European utilities, it is relatively inexpensive, it uses utility owned medium and utility allocated spectrum (CENELEC A Band). A DLC trial was conducted where 1200 customers in Mid-West were given smart meters which used the powerline going into their home (Distribution Line Carrier) as the communications technology. The system was based on what is used in a number of European smart metering deployments and the implementation used by ESBN generally complied with open IEC standards.

Where DLC meets the performance and functional requirements is generally seen as the system with the lowest total cost of ownership, however outside of towns and cities its implementation cost is prohibitive. The experience of the DLC trial in terms of the technology was that the technology was adequate for monthly cyclical collection of the data and on demand requests where the performance levels were not onerous. However when used to collect profile and other data from the meters on a daily basis it was difficult or impossible to achieve reliability levels greater than 90% on any of the 11 substations used in the trial. There were similar issues in relation to latency. We concluded that this was due to narrow bandwidth, the small number of available channels and limited intelligence in the protocols. In particular it was difficult achieve good performance in 'noisy' networks.

However, we note that there is significant ongoing work by major utilities in France and Spain in the development and piloting of the next generation of PLC which is set to address the issues identified in the trial. ESBN is of the view that should this work be successful, the fact that DLC is an open standards technology which uses exclusive utility spectrum and still probably having the lowest total cost of ownership will likely mean that next generation DLC is a leading option for customers in Cities and Towns in line with most of Europe.

Uniquely in Europe one third of our customers live in rural areas which are unsuitable and uneconomic for any form of DLC. Based on North American and Australian roll outs RF appeared to have the potential to offer higher capacity and performance levels. The majority of wireless solutions for smart meters worldwide operate in the

900MHz band which is not currently available for such systems in Ireland due to Irish Spectrum Regulations. Nonetheless ESBN deployed a 2.4GHz wireless mesh system in 2,500 customers in rural and urban areas in Cork.

The experience of the trial was that the system performed well in urban areas where customer density was high with reasonable performance levels for daily collection of data achievable. However, the limitations imposed on the system by communications regulations in relation to the transmit power meant that in rural areas, where distances between houses are much greater, high performance levels were much harder to achieve. Unlike DLC, RF solutions generally are proprietary in nature, and our experience in the pilot underlined the risks associated with such an approach. We note the work ongoing in North America on standardising wireless mesh smart metering technologies.

Almost 700,000 rural customers at least will require a wireless solution and availability of suitable spectrum would greatly increase the viability and improve the economics of this option, perhaps even for all customers.

In North America the system is permitted to operate at 1Watt EIRP (max 100mW in Europe), end points are located outdoors and construction methods are more amenable to systems operating at this frequency. This coupled with the availability of license exempt 900MHz spectrum means that conditions are advantageous for the development of last mile solutions suitable for utility requirements using RF technologies.

We utilised a public mobile network for one of the trials. This system utilised GPRS technology and was found to be the most effective technology trialled. The technology has many advantages over the other technologies trialled, it has sufficient capacity, its latency is low and coverage is good. However there are also drawbacks to the use of a general purpose mobile system for mission critical applications. Commercial grade public networks are unsuitable for mission critical applications in terms of coverage, availability and operational practices.

ESBN used GPRS as the communications technology in 6,500 meters mainly used for the customer behaviour trail. The experience with GPRS was very good. Over 95% of customers, randomly selected, had good coverage. Typical 98 – 99% performance levels were achieved for first time daily collection of data. Another positive aspect of GPRS is that the technology is fully standardised. However, the total cost of ownership may be prohibitive with the prospect of Opex. Costs considerably in excess of LAN based solutions. Currently the cost of changing mobile network operator post roll out is probative as a visit would be required to each meter to replace the SIM. In addition in the context of the CBA there would be a dependency on the mobile operator to support the technology in the meter for the life of the meter. In the absence of viable wireless options as described previously the issues would need to be addressed

The nature of the service offered by MNO's does have some important operational limitations; it does not support multicast or broadcast capability, limiting the effectiveness of the solution for performing mass upgrades or mass instantaneous commands. This is important in times of emergency and for management of the

meters and end devices. There are also limitations placed on time of use which will also impair the effectiveness of the solution. The solution is unlikely to offer a ubiquitous always-on service, this will impact on the ability to perform on demand tasks in a timely and guaranteed manner.

Coverage does not map directly to the requirements of a utility. Electricity substations and switching equipment are typically situated in locations where signal strength is, by definition, poor, as they are located away from population centres. High levels of availability are required in times of crisis and difficulty, storms leading to power outages for example. It is in these very instances that public networks will not be available as they are not designed and built to cater for prolonged power outages.

There are numerous examples worldwide where commercial grade mobile networks have failed in circumstances where the need of the utility would be at its greatest.

From ESBN's investigation of the marketplace for last mile solutions, for utility requirements, it is clear that an RF solution in the sub-1GHz range based on dedicated spectrum will provide the strongest possibility of meeting these needs in the Irish rural context.

It is clear that the market for RF solutions is driven from North America and that most of the innovation and standardisation initiatives are being carried out there. Existing systems such as those provided by market leaders such as Silver Spring Networks and Itron operate in the sub-1Ghz range, in licence exempt spectrum between 902MHz and 928MHz. The propagation characteristics of solutions in this range offer greater effective link length and building penetration. These are essential in the Irish rural environment. The American systems also operate at transmit EIRP of 1W, once again improving the performance of the system, these characteristics coupled with the Meshing capability of some of the systems maximise the performance and capability of the systems, giving good coverage, capacity, latency and availability.

Developments on standardisation of the systems are advancing with announcements from key industry players such as Cisco Systems, Arch Rock and Silver Spring Networks supporting the development of IPv6 capability for their systems. Further to this the amendment of the 802.15.4 specifications for Smart Utility Networks(IEEE 802.15.4g) to incorporate 900MHz capability at the PHY layer further enhances the attractiveness of meshed RF solutions in the sub 1-GHz band.

Access to sufficient dedicated spectrum would allow ESBN to develop and build a last mile system with sufficient capacity, coverage, availability and reliability to meet the requirements of smart metering and smart networks.

This last mile system would incorporate the advances in technology and standardisation driven by the North American market, attracting the advantages of innovation, scale and investment already achieved there due to market size, government stimulus funding and advanced position in the smart energy lifecycle.

5. ESBN Proposal

It is opportune that this consultation and liberalisation process should occur at this time and it is therefore important for ESBN to outline its proposal.

ESBN proposes the allocation of 10MHz of dedicated spectrum in the 900MHz band to enable Smart Utility Networks to support the long term requirements of the energy industry, its customers and the state. This network will facilitate all of the benefits described above including safety, security of supply, energy efficiency and consumer choice through the provision of timely and accurate information and it will facilitate the adoption of distributed generation from renewable sources.

This proposal meets several of the criteria outlined by ComReg in its strategy for the management of Spectrum in Ireland.

- It provides for innovative technologies and services
- It maximises the economic and social returns from the use of radio spectrum;
- Ensure the efficient use of scarce radio spectrum resources; and
- Manage compliance with international requirements and the avoidance of harmful interference.

This proposal is in line with developments in other jurisdictions such as Canada were dedicated spectrum has already been set aside for utility use, and the USA which is expected to harmonise with the Canadian position and Australia where consultations are ongoing The national regulator ACMA is currently updating its “Five year Spectrum Outlook” and one of the proposed substantive updates to the 2009 – 2013 version is to the information relating to the potential for spectrum to support area-wide and state-wide Smart Grid applications.

Benefits Arising from Proposal

Safety

Safety is a core value of ESBN. Electricity is a potentially lethal product and the foremost consideration for ESBN is to ensure the safety of staff and the general public. Network protection is a mission critical use of telecommunications by ESBN along with communication with monitoring and control

Network protection signalling is vital for ensuring that when a fault occurs on the high voltage network, that section of the network is automatically isolated and the network operations centre notified. This limits the impact of the fault (in terms of the time to isolate and the number of customer affected and possible damage to the network) and ensures isolation to remove potentially dangerous situations to members of the public (e.g. line down).

Communication links must also be extended to manage an expected large growth in distributed generation such as residential solar PV. In some circumstances there is a risk that the line may have been isolated from power flowing downstream; however, the line might still be 'live' due to the feed-in of electricity from distributed generation sources. The management of any power flow back into the grid from distributed generation is essential for the safety and well being of electricity field crews.
Similarly, when there is an instance of a low voltage electrical line that has been felled there is a serious risk to life for the general public. Having a robust communications system allows electricity distribution utilities to effectively coordinate emergency events and rapidly neutralise the threat to public safety and then restore power.

Economic benefit of a reliable power supply

Economic output is heavily reliant on the availability of a reliable and efficient supply of electricity. Industrial output can be severely impacted even by momentary losses of supply, whilst longer outages can have adverse impact nationally.

The provision of a secure and reliable telecommunications network will help to minimise outages and the consequential economic losses arising.

Cost Efficiencies

Significant cost efficiencies can be gained by developing a private, optimised utility telecommunications network, the last mile segment being the single biggest part of this. Support of a number of disparate point solutions leads to inefficiencies and increases support and maintenance costs and constant ongoing technology refresh. Outsourcing operations to commercial network operators can lead to sub optimal solutions and will require additional investment to fill in gaps in service, either through payment to the operators to improve coverage, availability or reliability or through the need to build infrastructure where the operators are not prepared to go, due to the lack of an economic incentive (e.g. poor return due to low population density)

6. Response to Questions

Q. 1: ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg "s proposal? Please provide reasons for your view.

ESBN agrees with ComReg's proposal.

Q. 2: ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg "s proposal? Please provide reasons for your view

ESBN agrees with ComReg's proposal

Q. 3 Do you agree with ComReg "s proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view

ESBN agrees with ComReg's proposal. ESBN believes that the joint award will allow for the effective and efficient management of the radio frequency spectrum. It will allow operators to plan with higher degrees of certainty and to satisfy their requirements. It also allows for release of the spectrum on a liberalised, technology neutral basis allowing for consideration of alternate uses, such as those of Energy Utilities

Q. 4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

ESBN has no view on this, save that it agrees with the principle to release the spectrum on a technology neutral basis.

Q. 5 Do you agree with ComReg "s Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

ESBN agrees with this proposal

Q. 6 Do you agree with ComReg "s proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

ESBN has no view on this.

Q. 7 Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg "s statutory functions, objectives and duties.

ESBN requests ComReg to consider an alternative approach for the spectrum it is requesting. ESBN's proposal will provide lower cost to the community with respect to the flow on of cost in electricity charges by minimising the total communications costs of ESBN.

ESBN has an essential requirement for telecommunications without which it would be impossible for it to carry out its functions. There is a strong business requirement for ESBN to roll out a last mile telecommunications network when compared to the alternative of establishing a series of stand alone mission critical networks for the required connectivity to end-points and customers as required for system management, control and protection and for the smart meter rollout.

Electricity utilities are regulated monopolies and as such are only allowed earns a regulated rate of return (not a market based return) through electricity charges approved by the Commission for Energy Regulation. A regulated utilities ability to pay, therefore, is likely to be significantly different from that of a commercial carrier who may wish to use the same spectrum. Furthermore, the broader community has no way of expressing whether they would benefit more from the commercial provision of telecommunications services using that spectrum versus the provision of telecommunications services to assist with the distribution of their electricity supply. For this reason, if spectrum is to be allocated via public auction, there is a strong possibility that utilities will be denied access to spectrum and the community benefit may not be maximised.

Q. 8. Do you agree with ComReg's proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

ESBN agrees with this proposal as it provides for competition in the market place, prevents barriers to entry allows for new entrants and for alternative uses such as those outlined in this submission.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

ESBN agrees with this proposal as it provides for fair and adequate apportionment of spectrum among operators.

Q. 10. Do you agree with ComReg's proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

ESBN agrees with the proposal to hold an auction as the fairest means of allocating the spectrum and as a means of facilitating competition for the spectrum. However ESBN believes that a minimum of 10MHz of spectrum should be taken out of the auction process and set aside for Utility requirements to meet their needs and facilitate the services outlined in the submission above.

Q. 11. Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view.

ESBN agrees with this proposal as a means of harmonising the 900MHz band, temporally.

Q. 12. Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

ESBN has no views on this process except for those outlined in the responses to questions 7, 10 and 13.

Q. 13. Do you agree with ComReg's proposal to set a common minimum price for both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

ESBN agrees with this proposal, except for that portion of spectrum to be set aside for Utility use. ESBN believes that this spectrum should be priced in a manner to reflect its strategic value in terms of the services provided to support energy efficiency, safety and utility network reliability. See responses to questions 7 and 10.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

ESBN notes the recent publication "Proposed licensing regime for GSM for railway operations Spectrum", document 10/84. ESBN suggests that its proposal be treated in a similar manner, as the proposed uses of the spectrum will constitute a non-public, non-commercial network for utility use. ESBN therefore suggests that any fee structure should take cognisance of this. See also the responses to question 7, 10 and 13.

Q. 15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market.
Do you agree with ComReg's proposed coverage and roll-out obligation?
Please provide reasons for your view.

ESBN agrees with this proposal with the exception that in the absence of allocation of dedicated spectrum to facilitate a Utility Optimised Telecommunications network, ESBN would require guaranteed network coverage significantly greater the 70% to meet its operational requirements.

Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.
Do you agree with ComReg's proposed quality of service obligations?
Are there any other conditions which ComReg should consider imposing on licences?
Please provide reasons for your view.

ESBN agrees with this proposal.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services. Do you agree with Comer's proposed miscellaneous obligations? Please provide reasons for your view.

ESBN agrees with this proposal.

Q. 18: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

ESBN agrees with this proposal

Q. 19: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

ESBN agrees with this proposal

Q. 20: Do you agree with ComReg's proposal to issue „preparatory licences" to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

ESBN agrees with this proposal.

5 Imagine

LIBERALISING THE USE OF 900MHz AND 1800MHz SPECTRUM BANDS

IMAGINE COMMUNICATIONS RESPONSE TO THE CONSULTATION

Q. 1 ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg" s proposal? Please provide reasons for your view.

The proposal set out in Q1 appears to conflict with ComReg's position as set-out in paragraph 4.6.2 of the consultation paper. Imagine does not agree that the services should be restricted to FDD operation. However, we do agree with agrees the proposal in 4.6.2 that the licences be offered on a technology and service neutral basis. The Annex to the EC decision sets out technical parameters for both TDD and FDD modes of operation and this should provide the basis for the licence conditions.

The ecosystem for 4G network deployment is still evolving. Two variants of LTE (FD and TD) are developing as well as WiMAX-based solutions. These solutions may ultimately converge and it is important that licence conditions do not artificially restrict the potential for this convergence.

The developing 4G market is illustrated by the acquisition by Broadcom of Beceem Communications, the leading provider of multimode LTE and WiMAX chipsets (October 2010).

Q. 2 ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg" s proposal? Please provide reasons for your view.

Imagine agrees that the block edge masks should be in line with the EC Decision.

Q. 3 Do you agree with ComRegs proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Imagine agrees that both blocks are substitutable and there should be a joint award of both blocks.

Q.4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

No response.

Q. 5 Do you agree with ComReg's Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

No response.

Q. 6 Do you agree with ComReg' s proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

No response.

Q. 7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg" s statutory functions, objectives and duties.

No response.

Q. 8. Do you agree with ComReg's proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

Imagine agrees with the proposal to set a sub 1GHz cap. This cap will help to encourage market entry for the provision of mobile voice and broadband services.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

Sub 1GHz 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 that sufficient spectrum is awarded to new market entrants and not just existing mobile operators.

Imagine does not believe that the proposed award structure will result in new market entry and that the proposed structure is skewed in favour of licence award to the incumbent mobile network operators. In our view a 2x15MHz cap should be used with one of these licences reserved for new market entry. The terms and conditions of this licence should be graduated to reflect the increased costs of such entry as well as the long term economic and social benefits. Imagine is also concerned that the absence of a requirement to provide for MVNO's using the new liberalised licences could further erode competition in the mobile voice and data market.

Q. 10. Do you agree with ComReg's proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Imagine does not agree that an auction mechanism 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.

Q. 11. Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view. 800 MHz, 900 MHz & 1800 MHz spectrum release 76 ComReg 10/71

No response.

Q. 12. Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

No response.

Q. 13. Do you agree with ComReg's proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

Imagine does not agree with the proposed pricing structure as the proposed minimum price is a severe deterrent to new market entry. We also do not necessarily agree that liberalising the spectrum will result in significant cost reductions for incumbent operators. Therefore, an increase in the licence fees for incumbents may not be justified.

The benefits of spectrum liberalisation will not be achieved by the amount someone is prepared to pay to acquire this spectrum. Rather, the award process should also test the intent of any alternative bidders to bring competition and increased value to the market. This includes a graded licence fee which should be used to encourage new market entry.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

The reserve prices and spectrum usage fees are excessive and will strongly discourage new market entry. On this basis, Imagine recommends a graded licence with significantly reduce licence fees for a new market entrant.

Q. 15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market.
Do you agree with ComReg's proposed coverage and roll-out obligation? Please provide reasons for your view.

Imagine does not agree with this proposal as it greatly reduces the prospects of new entry to this market. The coverage requirement should be relaxed to no more than 50% population coverage. National roaming should also be facilitated through the licensing regime to enable national coverage for any new entrant.

Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.
Do you agree with ComReg" s proposed quality of service obligations? Please provide reasons for your view.

Imagine agrees in principle with setting minimum quality metrics in the licence.

Imagine believes that the paper billing standard is an anachronism and should be revised to allow e-billing as standard. Efficient market entry for any new operator requires that they can operate with maximum flexibility and in a cost effective manner.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.
Do you agree with ComReg" s proposed miscellaneous obligations? Please provide reasons for your view.

Imagine agrees in principle with these obligations.

Q. 18: Do you agree with ComReg" s proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

No response.

Q.19: Do you agree with ComReg" s proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.
800 MHz, 900 MHz & 1800 MHz spectrum release 77 ComReg 10/71

No response.

Q. 20: Do you agree with ComReg‟ s proposal to issue „preparatory licences‟ to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Imagine agrees with this proposal.

6 Qualcomm

Qualcomm Europe Inc.

ComReg consultation paper on 800 MHz, 900 MHz & 1800 MHz spectrum release

Qualcomm Response

October 2010

Introduction

Qualcomm welcomes the opportunity provided by ComReg to submit its views on the 800 MHz, 900 MHz & 1800 MHz spectrum release and liberalisation.

Qualcomm applauds ComReg for its intention to foster the development of mobile broadband services in Ireland through the liberalisation of the 900 MHz and 1800 MHz bands and the award of the 900 MHz, 800 MHz and 1800 MHz bands. While Qualcomm believes that most of Comreg's proposals seem appropriate to enable such development in the long term, we are concerned that any the delay in the liberalisation of the 900 MHz and 1800 MHz bands will negatively impact the availability of affordable and pervasive mobile broadband services in Ireland.

In particular, Qualcomm does not share the technology and spectrum views put forward by the consultant dot.econ and we believe that they may not enable ComReg to adopt informative decisions on the liberalisation and release of the mentioned bands. Qualcomm argues in particular that ComReg's considerations should take into account the ecosystem development in the various frequency bands and associated handset availability.

The ecosystem around UMTS900 is now very mature. Irish users can benefit from enhanced mobile broadband services with HSPA900. It is commercially deployed in 18 networks (including France, Poland, Sweden, Belgium, Finland, Romania, Croatia, Latvia, Estonia and Iceland) and 401 HSPA900 devices have been launched by 65 suppliers[1], including most recently the Iphone4. In fact, nearly 80% of 3G handsets sold today in Europe already

[1] Source: GSA

supports HSPA900. We therefore strongly recommend ComReg to liberalise the 900 MHz to allow the deployment of UMTS900 as early as possible. A delay in 900 MHz liberalisation till 2013 as proposed would be detrimental to the development of mobile broadband services in Ireland. We consider that competition issues could be better addressed through the rules of the auction to be held in 2011.

Furthermore, we are witnessing an increasingly growing demand for UMTS and LTE technologies in the 1800 MHz and we recommend ComReg to proceed with the liberalisation and release of the 1800 MHz spectrum as soon as possible.

The release of the 800 MHz will enable the cost efficient and optimal deployment of LTE services.

Finally, taking into account the various market competition issues raised by ComReg in its consultation, Qualcomm would like to limit its current response to mobile broadband market, technology and spectrum policy considerations.

Mobile broadband will democratise the access to the internet

Mobile broadband is both a large opportunity for operators and a life changing experience for users. The digital divide, i.e. the inability for a significant percentage of the population to benefit from digital services such as internet access, is rightfully identified as a key challenge for both society and economy. Mobile broadband is key to bridge the digital divide as it allows cost-efficient coverage of sparsely populated areas.

Bridging the digital divide, i.e. allowing all citizens to access the same digital services, is a key societal objective. The digital platform is supporting the development of services such as e-health, e-aging, e-government, e-safety. More and more, access to broadband is critical for employment and business opportunity. In general, mobile broadband has been recognized as a key element to obtain a national competitive edge and is crucial for a sustainable economic growth. This explains why the nationwide availability of quality mobile broadband access is a prime objective for many governments.

From a business perspective, mobile broadband has a growing importance in operator's business models, with a clear trend of data revenues increasing among operators. Fast connection and ubiquitous coverage are two key components to drive the usage of data services.

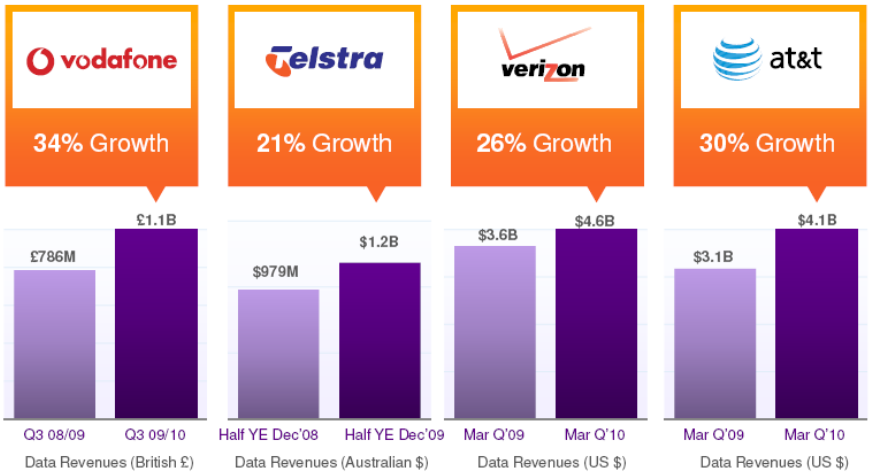


Figure 1: Operators' data revenues are growing worldwide.

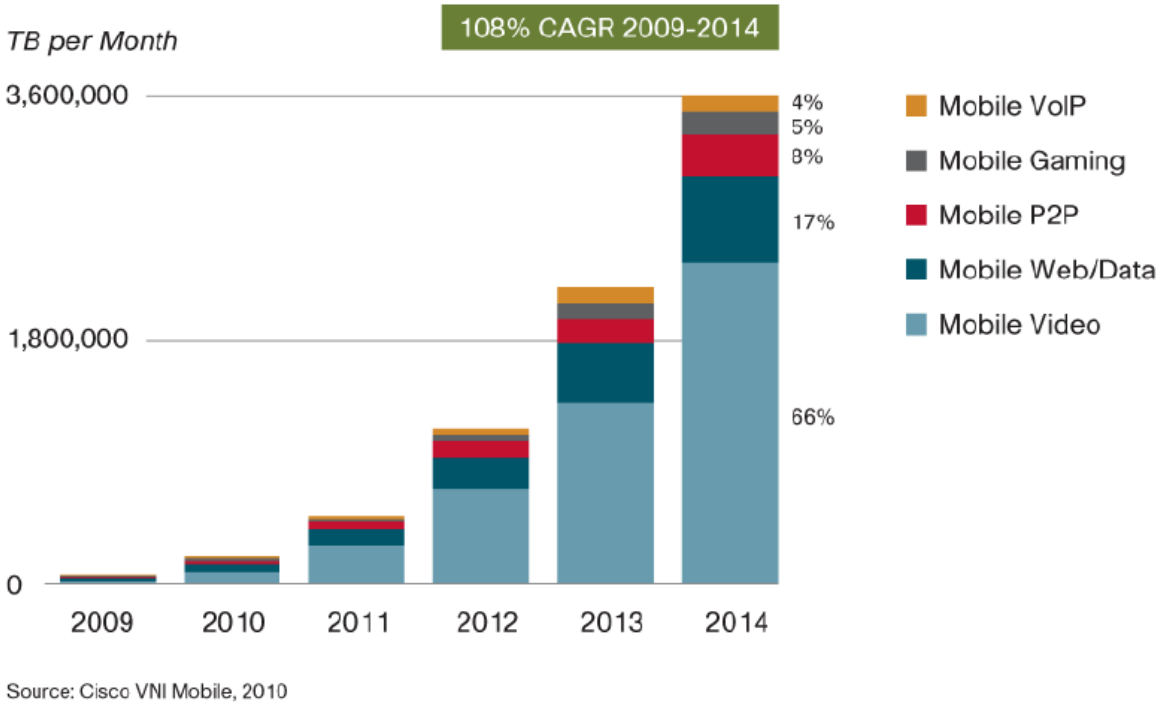


Figure 2: Mobile broadband traffic forecast.

The availability of affordable and pervasive mobile broadband services is key for Ireland social and economic growth. In particular, innovation in terms of services would remain limited if ubiquitous deployment mobile broadband is not ensured. The expected explosion of data traffic due to the diversity of mobile broadband applications will strengthen the need for considerable additional harmonised spectrum to be made available.

Mobile Broadband: Technology characteristics and foreseen evolutions

GSM-only terminal penetration decline

GSM devices support mainly voice services, with very limited data capability. Customers have been upgrading their current devices to 3G capable devices for some time, due to the focus on mobile broadband services and the demand for smartphones and other advanced devices. Such a market evolution leads to the natural decline of the penetration of GSM-only terminals

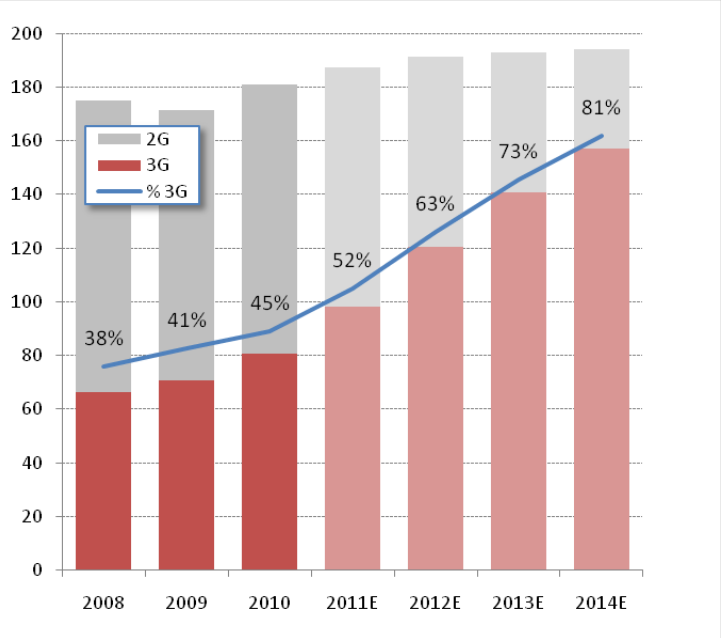


Figure 3: Western Europe handsets sales (m)[2]

This trend will accelerate as mobile broadband becomes the dominant differentiating factor for operators.

[2] Source: Consolidated analyst view

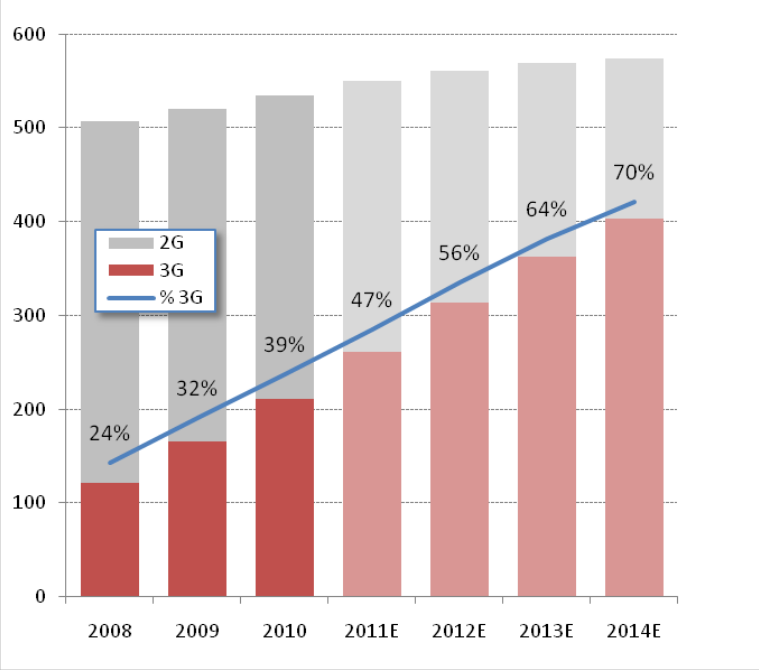


Figure 4: Western Europe subscribers (m)[3]

The rise of 3G devices is particularly relevant in the context of the 900MHz band. UMTS900 devices have been launched by 65 suppliers[5], including the Iphone4. In fact, a vast majority of 3G handsets sold today already support UMTS900. As such, UMTS900 is the current mobile broadband technology of choice in the 900MHz.

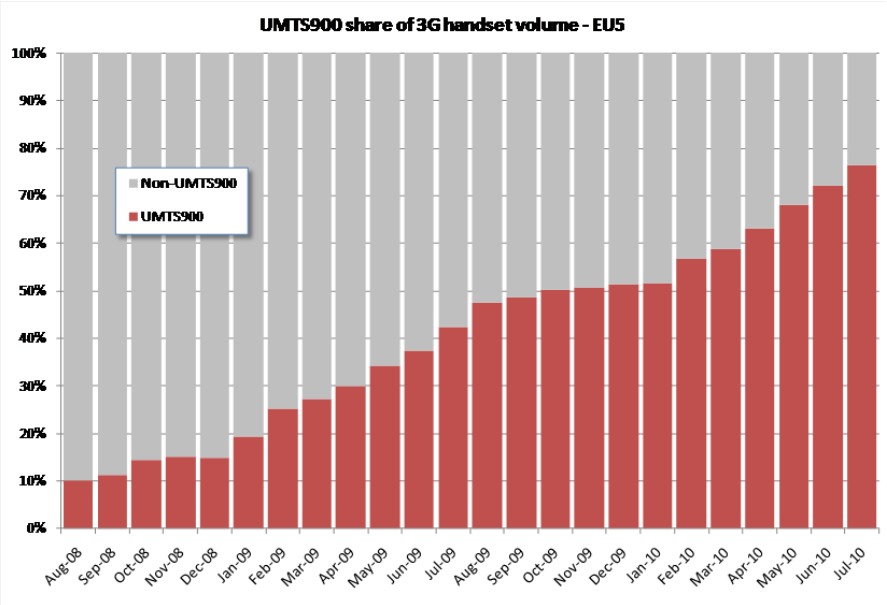


Figure 5: close to 80% of 3G handsets sold in EU5 support UMTS900[4]

[3] Source: Wireless Intelligence

HSPA supports mobile broadband today

HSPA+, an evolution of UMTS, offers significantly improved data rates and features together with a breakthrough from the 2G background. HSPA+ commercial deployment started in 2009. In its Release 7, HSPA+ allows peak data rates from 21 Mbps up to 28 Mbps by implementing 64 QAM and/or MIMO. This evolution also significantly improves the capacity of mobile networks (doubling the capacity of existing HSPA networks), hence enabling the mass-market offering of mobile data services (mobile Internet, Mobile 2.0, data connectivity through USB keys or built-in modules, 3G based M2M).

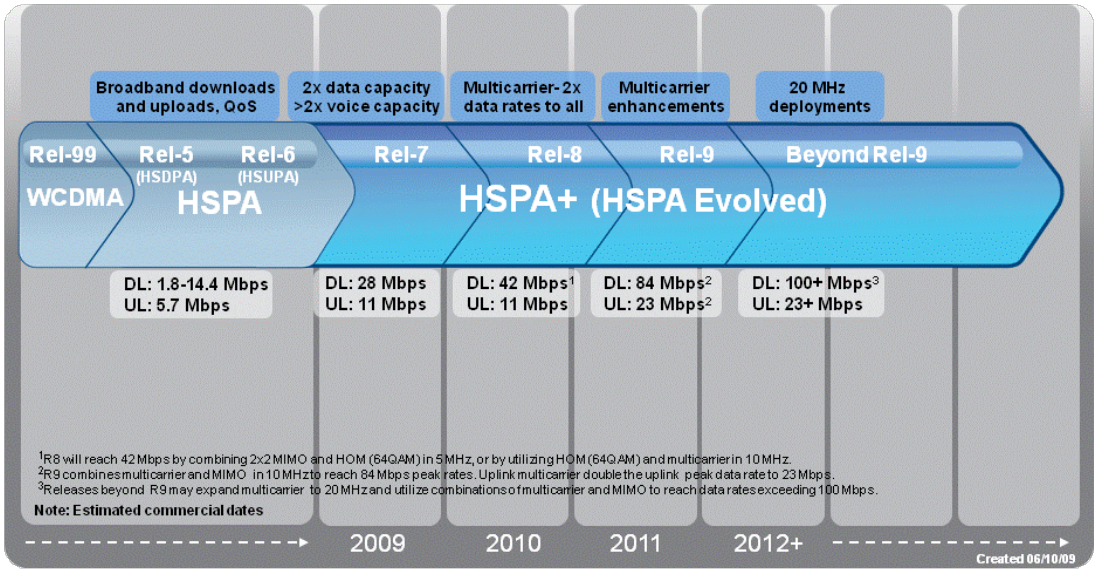


Figure 6: HSPA+ delivers next generation mobile broadband performance today.

Some key HSPA+ Release 7 features have favored the adoption of the technology by mobile operators:

- First and foremost, HSPA+ is readily implemented in existing network equipment and represents a cost efficient functional evolution of existing 3G networks. The handsets benefit from the backward compatibility of HSPA+ with previous HSPA versions.

- HSPA+ brings timely significant capacity improvement in a 5 MHz channel, as mobile data usage is exploding and operators now need multiple HSPA carriers in some dense urban areas.

[4] Source: GFK

Multi-carrier technology, i.e. the simultaneous multiplexing of data over adjacent 5MHz channels, allows HSPA+ in its Release 8 to improve and ensure the reliability of the data rates, under real load scenarios, experienced by the mobile user over the entire cell and especially at the cell edge.

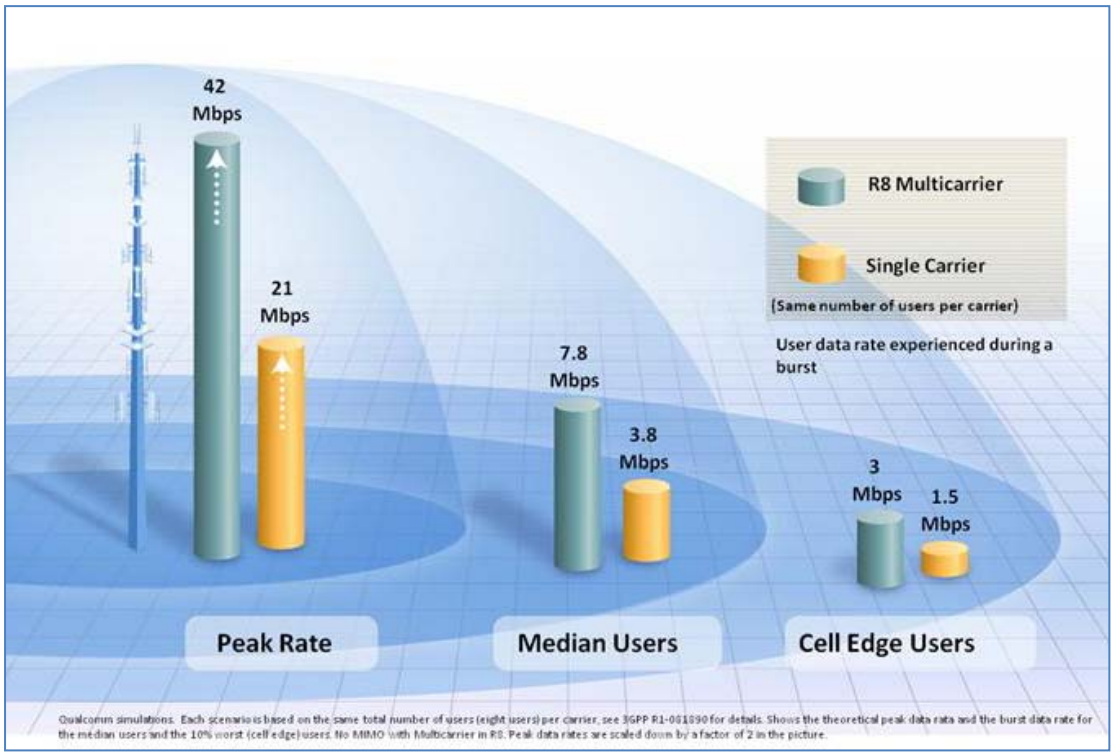


Figure 7: Carrier aggregation improves the user experience throughout the cell.

Beyond Release 8, Release 9 further enhances HSPA+ capabilities, offering even higher data rates by combining multicarrier and MIMO in the Downlink and through multicarrier in the Uplink. Release 9 also introduces multicarrier across bands enabling an efficient use of all available frequency resources (e.g. 900 MHz and 2.1 GHz).

LTE will leverage wider spectrum

LTE is an optimized OFDMA solution, on the roadmap of 3G evolutions, improving spectrum efficiency in wider FDD spectrum and leveraging TDD spectrum. HSPA+ and LTE offer parallel and complementary evolution paths. While HSPA+ allows optimal usage of 5 MHz and 10 MHz FDD channel bandwidths, LTE would be optimum for new FDD frequencies with channel bandwidths of 10 MHz or more as well as for TDD spectrum.

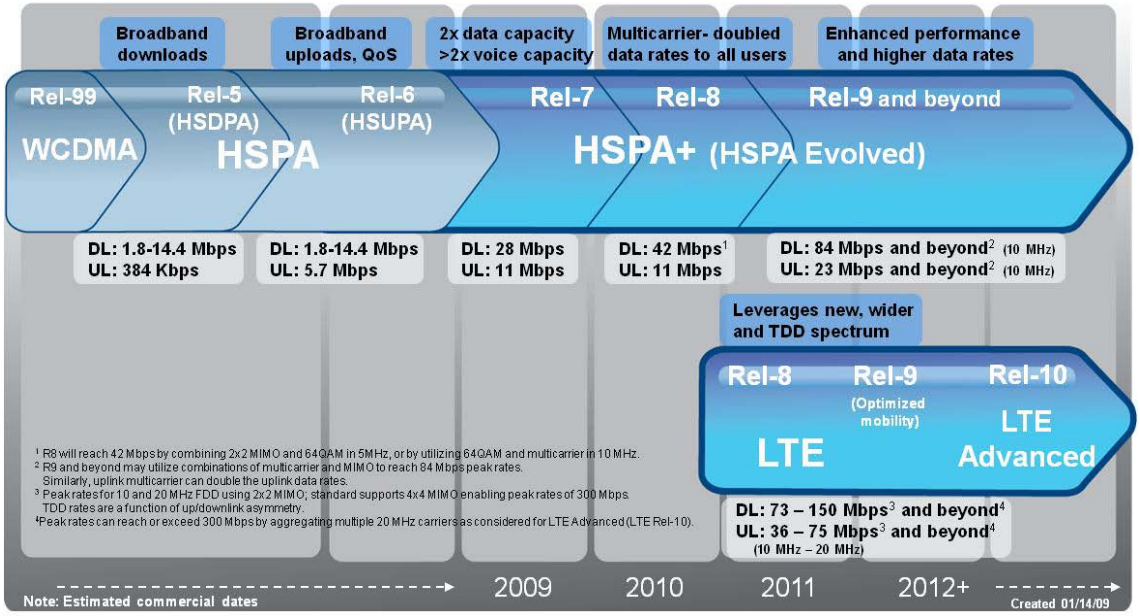


Figure 8: HSPA+ and LTE propose parallel evolution paths for mobile broadband.

LTE will initially enable the increase of data capacity in urban areas, particularly through the roll-out of mobile broadband networks operating in the 2.6 GHz band (10 MHz and 20 MHz FDD channels and TDD). LTE successful deployment resides in the ability of mobile operators to offer a consistent mobile broadband experience to users across the country and abroad, through handover and interoperability standardised capabilities, with HSPA+. This paradigm requires multi-modes terminals for early LTE roll-out. USB dongles based on Qualcomm multimode chipset (LTE, HSPA+, EV-DO Rev. B) for European bands could be available early 2011.

Significant future improvements to mobile networks (WCDMA or OFDMA), especially in terms of network capacity, will come from optimising the networks topology, such as adding femtocells and picocells bringing the transmitter closer to the user, rather than from the air link technology. Optimized advanced topology networks using picocells and femtocells are one of the LTE Advanced (Release 10) objectives.

Optimal deployment of LTE will require leveraging larger channel bandwidth (10MHz, 15MHz and 20MHz) and low and high frequency bands for coverage and capacity purposes in order not to recreate a new digital divide and maintain ubiquitous access to all citizens.

Terminals performance limits in 800 and 900MHz bands

The 900 MHz and 800 MHz bands are very attractive for the deployment of mobile broadband networks due to their excellent propagation characteristics. However, these bands

present some challenges in terms of terminal implementation, due to the limited separation between the uplink and the downlink band:

- The 900MHz band includes a 45MHz duplex spacing and an 10MHz duplex gap.
- The 800MHz band includes a 41MHz duplex spacing and an 11MHz duplex gap.

The limited duplex spacing leads to self-interference constraints for terminal design. As a result, the performance limits of the duplexing filters would restrict the overall performance of HSPA+ and LTE terminals in the 800/900 MHz bands for bandwidths higher than 10MHz. These restrictions have been captured in the 3GPP 36.101 (LTE) specifications. Using larger than 10MHz bandwidth in 800 MHz and 900 MHz bands would require advances in radio-frequency components technology. Such performance improvement would require improvement of several orders of magnitude compared to the performance of current components.

Multiband carrier aggregation for optimal performance

While the market is leading towards to the of 800/900MHz handsets with bandwidth up to 10MHz today, another technological development provides a viable way to achieve the higher performances.

3GPP technologies (both HSPA+ and LTE) will support multi-band multi-carrier aggregation. Terminals could be ale to operate simultaneously on one or two 800 MHz carrier(s) and one or two 900MHz carrier(s) as well as other frequency bands combinations in order to create a virtual wider channels corresponding to the aggregation of those bandwidths.

Ecosystem, terminal availability and frequency management

As expressed in the previous sections:

- Ireland's best interest would reside in ensuring both the fast availability of mobile broadband and support its long term evolution.
- Mobile broadband is currently supported mainly by two technologies, i.e. HSPA+ and LTE. HSPA+ and LTE offer parallel and complementary evolution paths.
- Terminals in the 800 and 900 MHz bands would support up to 10MHz bandwidth as per current market demand
- Terminals would in the future be able to aggregate carriers across band including in the 800 MHz and in the 900 MHz bands in order to form virtual very large bandwidth channels.

The growing importance of the terminal ecosystem

The selection of a technology for the network infrastructure (base stations) is no longer the critical factor as most base stations are evolving to support various air interfaces enabling the operators to select at any given moment the appropriate technology for a specific band, depending on market demand. The availability and the price of terminals, i.e. the terminal eco-system in the band will remain however a key parameter.

As a result, a successful mobile broadband deployment relies mostly on the availability of cost-efficient terminal equipment. In this context, Qualcomm recommends ComReg to take into account both:

- The time constraints linked to the maturity of the technologies.
- The development of the European market at large.

Technology neutrality and harmonised band plan

First and foremost, 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.

The selection of a non-harmonised band plan, or non-harmonised technical spectrum usage rights would require the development of terminals specific to Ireland.

While regulatory intervention should be limited to adoption of harmonised regulatory regimes, it is also important for European regulators to understand the European market dynamics at large, in order to ensure that their citizen benefit from affordable, readily available and roaming capable equipment. Specific decisions, e.g. auction rules, that favor the emergence of a country specific market, especially when it comes to the terminal market, should be avoided as it would undoubtedly lead to restriction in the availability of the service.

HSPA900 can bridge the digital divide today

HSPA900 provides immediate solutions in terms of performance requirement, capacity to bridge the digital divide and most importantly technology availability.

HSPA delivers today a true mobile broadband user experience. HSPA+ has also now been made available to the 900 MHz frequencies allowing peak rates of more than 28 Mbps on HSPA+900 dongles, and first commercial network rollouts have been completed on HSPA+ 900 in Poland and Romania.

HSPA900 allows significant coverage at reasonable cost by reusing the current 2G network topology. France, a sparsely populated country by European standards, will achieve 98 percent mobile broadband coverage by 2011 with HSPA900, and 99.3 percent of the population will be covered by the end of 2013.

But perhaps most importantly, users can benefit from HSPA900 immediately following deployment due to the large availability of the technology. HSPA900 is commercially deployed in 18 networks (including France, Poland, Sweden, Belgium, Finland, Romania, Croatia, Latvia, Estonia and Iceland) and 401 HSPA900 devices have been launched by 65 suppliers[5], including the Iphone4. In fact, a vast majority of 3G handsets sold today already support HSPA900.

[5] Source: GSA

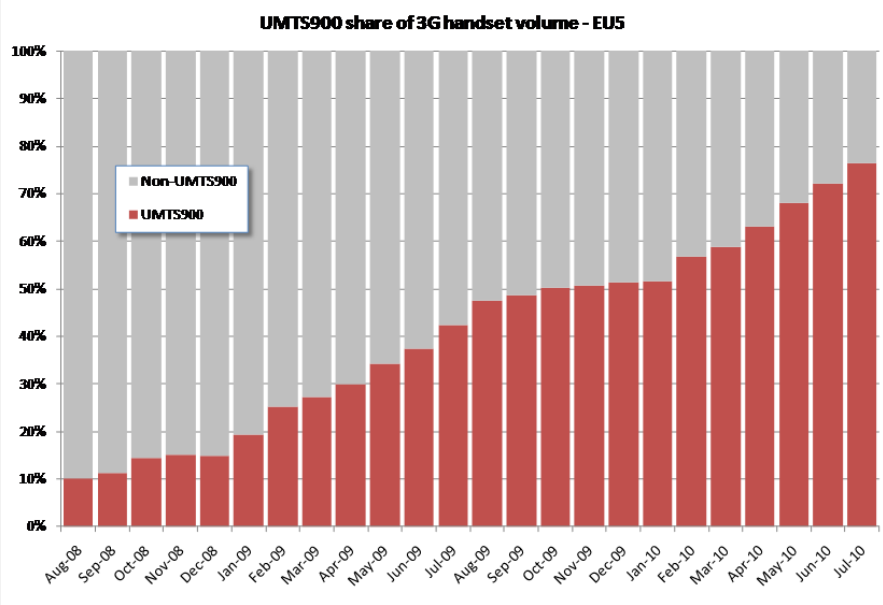


Figure 9: close to 80% of 3G handsets sold in EU5 support UMTS900[6]

In parallel, the entry price of 3G devices has been considerably reduced and now is close to challenging the price of GSM technology, while providing a significant upgrade in terms of functionalities. In Europe, while 3G smartphones are now entering the 100-150€ retail price range with a solid uplift in Q2 2010, 3G has been stepping up promisingly in the 50-100€ retail price range over the same period. Finally, first entry phones are now existing at a less that 50€ retail price.

[6] Source: GFK

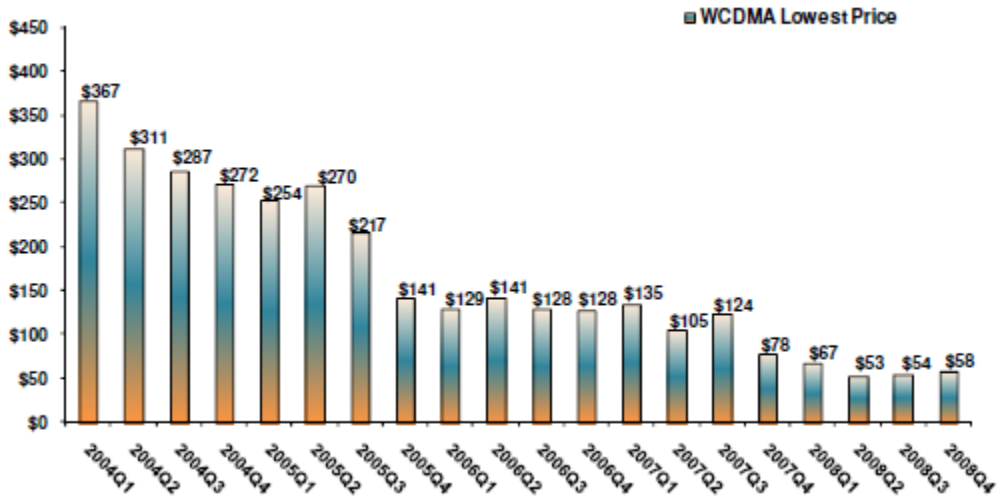


Figure 10: The entry price of 3G handsets (WCDMA handset lowest price) has decreased dramatically since the introduction of technology, and now challenges market entry prices.

Therefore, Qualcomm argues that HSPA900 is the optimal solution in order to provide ubiquitous and affordable mobile broadband services in the short and medium term.

LTE800 will provide coverage for the evolution of mobile broadband

Optimal deployment of LTE will require leveraging larger channel bandwidth (10MHz, 15MHz and 20MHz) and low and high frequency bands for coverage and capacity purposes in order not to recreate a new digital divide and maintain ubiquitous access to all citizens.

Throughout Europe, the 900 MHz band is, supporting both GSM and UMTS/HSPA services. The 900 MHz band does not offer the possibility to vacate 10 MHz of spectrum to introduce LTE technology. In the meantime, the 800MHz band is becoming available throughout Europe and, as a new frequency band, which can easily accommodate LTE systems with 10 MHz optimal bandwidth.

Qualcomm recommends adopting a frequency allocation process that would allow the award process to result in three licences of 2x10MHz each, as represented in the Figure below:

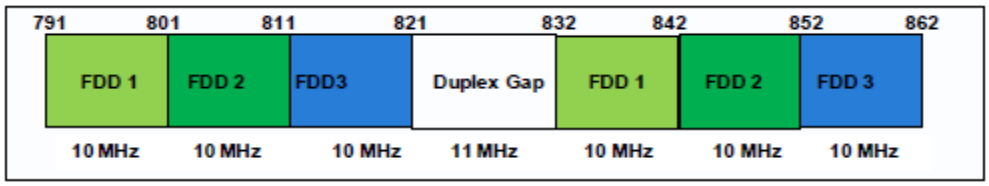


Figure 11: Optimal allocation outcome in the 800MHz band

This option has been the outcome reached in Germany during the recent auction of the 800MHz band, providing further support for its optimality. Qualcomm expects a significant eco-system to develop around LTE800 terminals with 10MHz bandwidth.

Conclusion

When assessing:

- the maturity of technologies,
- the market availability and existing eco-systems,
- the development and other European countries,

Qualcomm observes that the 900 MHz and 800 MHz bands align with two very distinct time schedules. While the 900 MHz band allows the availability of mobile broadband in the very short term, the 800 MHz band will support the evolution towards higher bandwidth in the future.

The 800 MHz and 900 MHz bands are complementary and their combination could offer important and valuable options to operators to support the growth of mobile broadband services in the short, medium and longer term.

Taking all this into account, Qualcomm does not believe that the 800 MHz and 900 MHz bands are equivalent and fully substitutable and we are of the view that the 800 MHz and 900 MHz bands should not be treated in an undifferentiated manner.

We also strongly recommend ComReg to allow the deployment of UMTS900 as early as possible and not to delay it till 2013 i.e. till the auction of the 800 MHz band. We consider that competition issues could be better addressed through the auction process to be held in 2011.

Furthermore, we are witnessing a growing demand for UMTS and LTE technologies in the 1800 MHz and we recommend ComReg to proceed with the liberalisation and release of the 1800 MHz spectrum as soon as possible.

Q. 1 ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg‟s proposal? Please provide reasons for your view.

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.

Therefore, Qualcomm applauds ComReg's proposal to adopt the harmonised FDD band plan for the 800MHz and to propose technology neutral licences for this band.

In addition, Qualcomm recommends adopting an award process which could result in the following optimal packaging:

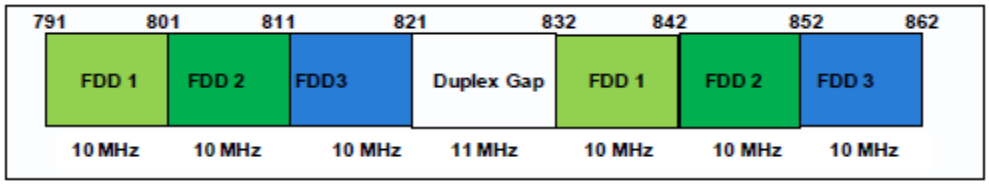


Figure 12: Optimal allocation outcome in the 800MHz band

This option was indeed the outcome reached in Germany during the recent auction of the 800MHz band, providing further support for its optimality. Qualcomm expects a very significant eco-system to develop around LTE800 terminals with 10MHz bandwidth.

Q. 2 ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg‟s proposal? Please provide reasons for your view.

Qualcomm supports ComReg proposal to adopt the harmonised. technical spectrum usage rights proposed in the Annex to EC Decision 2010/267.

Q. 3 Do you agree with ComReg‟s proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Independently of the timing of the award of each band, Qualcomm does not believe that the 800 MHz and 900 MHz are fully substitutable. Qualcomm also believes that ComReg should allow the deployment of UMTS in the 900 MHz without further delays.

Though the 800 MHz and 900 MHz bands may be similar in terms of physical characteristics, they are characterised by two different mobile broadband ecosystems development.

The 900 MHz ecosystem is very mature and oriented towards terminals supporting mainly a 5MHz bandwidth and based on UMTS/HSPA/HSPA+ due to:

- the limited spectrum in the band for each operator,
- the simultaneous operation with GSM,
- the near-optimal performance of HSPA on bandwidth below 10MHz
- the maturity of HSPA technologies,
- the availability of terminals.

In particular, it should be highlighted that 80% of 3G terminals sold today in the EU support UMTS900.

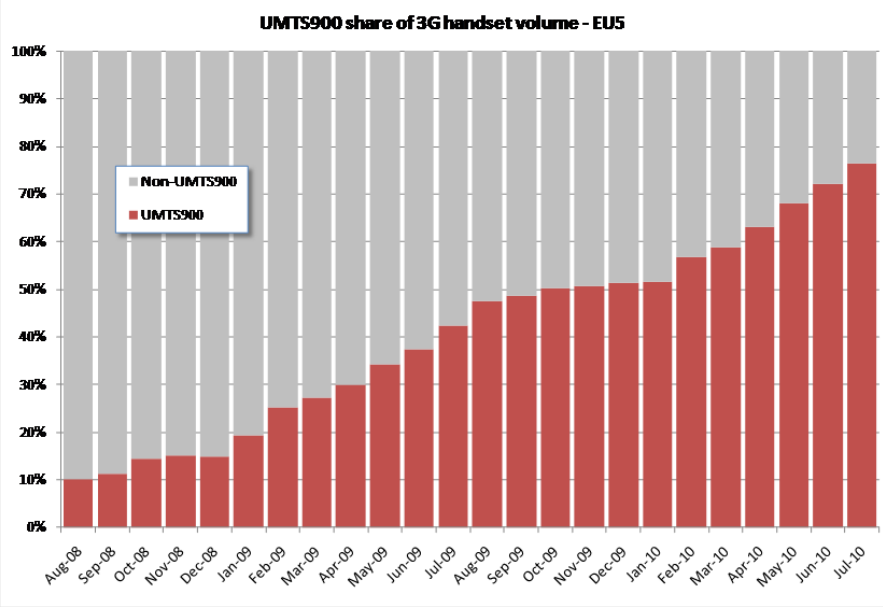


Figure 13: close to 80% of 3G handsets sold in EU5 support UMTS900[7]

On the other hand, the 800MHz ecosystem is working on longer terms opportunities and targets terminal with 10 MHz bandwidth, with the vast majority expected to be based on LTE.

[7] Source: GFK

An optimal spectrum allocation for an operator would be to combine 800 MHz and 900 MHz spectrum assignment.

- 900MHz spectrum would enable mobile broadband services based on UMTS900 in the short term, taking advantage of the wide availability of UMTS900 enabled handsets (e.g. smartphones, datacards),

- 800 MHz spectrum would enable to prepare the future evolution of mobile broadband networks, taking into account that its is one of the preferred bands for the introduction of LTE.

Qualcomm is confident that ComReg current proposal could be amended in order to allow the deployment of UMTS900 as early as possible and not to delay this deployment till 2013, which would have very significant positive effect on all Irish citizen. Qualcomm also underlines that ComReg has a great opportunity to promote efficient spectrum usage by allowing mobile broadband in the 925-937.8MHz, i.e. more than 10MHz of contiguous 900MHz spectrum which would otherwise remain unused until 2013 under ComReg's current proposal. In practice, an amended ComReg's proposal could fasten the development of mobile broadband in Ireland by more than 2 years.

In addition, Qualcomm believes that a spectrum policy framework based on technology neutrality enables an efficient use of spectrum, innovation, competition and the successful commercial development of wireless technologies in Ireland and in Europe. Therefore, Qualcomm is concerned with ComReg's desire to 'leapfrog the current generation of technologies'. Qualcomm fears that designing regulatory rules in order to hand-pick technology winners could result in significant drawbacks for Ireland economy and Irish citizens.

Qualcomm believes that a spectrum policy framework should be based on technology neutrality, which will allow the market to adopt the most appropriate technology at the most appropriate time. In particular, under a technology neutral assumption, ComReg would be in a position to promote the deployment of mobile broadband as early as possible, with very large economic and societal benefits likely to result from it.

Qualcomm recommendations

Qualcomm approves ComReg proposal to award the 800 MHz and the 900 MHz bands simultaneously in order to enable operators to deploy acquisition strategies combining both bands.

On the other hand, Qualcomm stresses that 800 MHz and 900 MHz correspond to widely different service offering and terminal availability timelines, with vastly unbalanced eco-systems. As a result, **the 800 MHz and the 900 MHz should not be considered as substitutable.** As a result, Qualcomm proposes that:

- The 800 MHz spectrum lots should be clearly identified and separated from the 900 MHz spectrum lots.

- The liberalisation date of the 900 MHz bands should not be artificially delayed. On the contrary, the introduction of mobile broadband in the 900MHz band should be allowed as early as possible.

- In particular, **mobile broadband should be allowed in the unused 900MHz spectrum blocks (925-935MHz) as soon as the auction is completed**.

Q. 4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Optimal mobile broadband deployment require leveraging coverage properties of low frequency bands together with larger channel bandwidths (10MHz, 15MHz and 20MHz) at high frequency bands. A sound mobile broadband network requires both low and high frequency bands for respectively coverage and capacity purposes.

We are witnessing that the demand for UMTS and LTE technologies in the 1800 MHz are starting to materialize and we recommend ComReg to liberalise and release of the 1800 MHz spectrum as soon as possible.

Qualcomm approves ComReg proposal to allocate the 800 MHz, the 900 MHz and the 1800MHz bands simulatenously in order to enable operators to deploy acquisition strategies combining all three bands in order to take into account both coverage and capacity requirements.

Q. 5 Do you agree with ComReg‟s Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

Qualcomm approves ComReg's proposal to allow a transition period up to 2013 for 900MHz incumbents operators in order to guarantee the continuity of service to GSM customers.

However, Qualcomm would favour further discussions and exchanges on the Interim Licence mechanism as in its view **the proposed approach does not adequately encourage efficient spectrum use.** Indeed, the current proposal prevents bringing the spectrum to its most efficient use until 2013.

Q. 6 Do you agree with ComReg‟s proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

Qualcomm would like to limit its current response to mobile broadband market, technology and spectrum policy considerations.

Q. 7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg‟s statutory functions, objectives and duties.

Qualcomm would like to limit its current response to mobile broadband market, technology and spectrum policy considerations.

Q. 8. Do you agree with ComReg‟s proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

A sound mobile broadband network requires both low and high frequency bands for respectively coverage and capacity purposes. Therefore, Qualcomm agree with ComReg desire to ensure a sufficient competition level playing field by safeguarding access to sub-1GHz (coverage) to all competitors.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

Qualcomm supports ComReg desire to ensure a sufficient competition level by safeguarding access to sub-1GHz (coverage) to all competitors but would not want to comment any specific figure.

Qualcomm recommends to take into account that the terminal eco-system and to recognize that the 800 MHz and 900 MHz correspond to different service offering and terminal availability timelines and that the 800 MHz and 900 MHz currently have different eco-systems.

Q. 10. Do you agree with ComReg‟s proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Qualcomm would like to limit its current response to mobile broadband market, technology and spectrum policy considerations.

Q. 11. Do you agree with ComReg‟s proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view.

Qualcomm understands that ComReg's proposal to use two temporal lots for the 800MHZ band is based on ComReg's assessment that the 800 MHz and the 900 MHz can be considered as substitutable. As discussed previously, Qualcomm believes that this assumption is not proven and underlines that **the 800 MHz and the 900 MHz should not be considered as substitutable.**

Q. 12. Do you agree with ComReg‟s proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

Qualcomm would like to limit its current response to mobile broadband market, technology and spectrum policy considerations.

Q. 13. Do you agree with ComReg‟s proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

Qualcomm would like to limit its current response to mobile broadband market, technology and spectrum policy considerations.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

Qualcomm would like to limit its current response to mobile broadband market, technology and spectrum policy considerations.

Q. 15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market.

Do you agree with ComReg‟s proposed coverage and roll-out obligation? Please provide reasons for your view.

Mobile broadband is both a large opportunity for operators and a life changing experience for users. The digital divide, i.e. the inability for a significant percentage of the population to benefit from digital services such as internet access, is rightfully identified as a key challenge for both society and economy. Mobile broadband, when deployed over the 800 MHz or the 900 MHz bands, is key to bridge the digital divide as it allows cost-efficient coverage of sparsely populated areas.

Given the critical and unique role of the 800 MHz and 900 MHz bands in bridging the digital divide, Qualcomm supports ComReg proposal to include ambitious coverage requirements in the licences.

Qualcomm notes that ComReg proposes not to allow coverage via national roaming to count towards the coverage and roll-out obligation. Qualcomm underlines that France, a sparsely populated country by European standards, will achieve near ubiquitous mobile broadband coverage (98 percent population by 2011 and 99.3 percent by the end of 2013) through, amongst other measures, allowing infrastructure sharing in underserved areas.

Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.

Do you agree with ComReg‟s proposed quality of service obligations? Please provide reasons for your view.

NC.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.

Do you agree with ComReg‟s proposed miscellaneous obligations? Please provide reasons for your view.

Qualcomm approves ComReg's proposal to include obligations that would require licensees to provide an international roaming capability as comprehensive as is practicable.

Qualcomm notes that mobile broadband international roaming will be supported by UMTS900 for years to come.

HSPA900 is commercially deployed in 18 networks (including France, Poland, Sweden, Belgium, Finland, Romania, Croatia, Latvia, Estonia and Iceland) and 401 HSPA900 devices have been launched by 65 suppliers[8], including the Iphone4. In fact, a vast majority of 3G handsets sold today already support HSPA900.

[8] Source: GSA

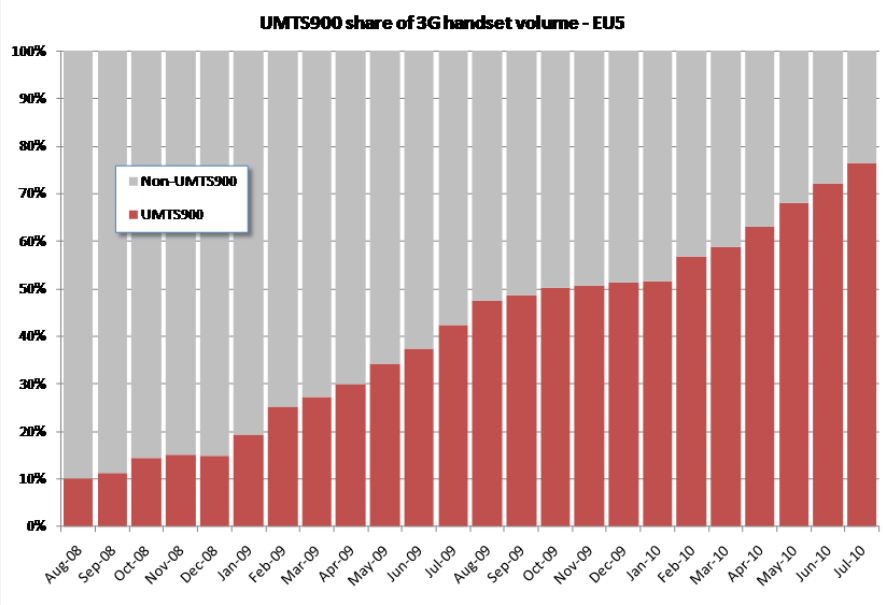


Figure 14: close to 80% of 3G handsets sold in EU5 support UMTS900[9]

Qualcomm underlines that roaming capabilities for Irish citizens, but also the business opportunities linked to mobile broadband users roaming to Ireland, are linked to the availability in Ireland of UMTS900.

Q. 18: Do you agree with ComReg"s proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

Qualcomm would favour further discussions and exchanges on transitional issues as in its view **the proposed approach would not adequately encourage efficient spectrum use.** The current proposal prevents the efficient use of spectrum until 2013, since mobile broadband introduction is prevented until this date.

Qualcomm underlines that the allocation of the 925-930MHz and the 930-935MHz blocks in priority to 900MHz new entrants on a technological-neutral basis promotes both an efficient use of spectrum and competition.

Qualcomm proposes:

[9] Source: GFK

- To adopt ComReg principle of a transitional licence up to 2013, should an 900MHz incumbent fail to acquire as much spectrum in the 900MHz band as it currently holds.
- To allocate the 900MHz unused spectrum in priority to new entrants on a technological neutral basis as soon as the auction is completed.
- To allow 900MHz incumbents to introduce new technology in the band as soon as they completed their transition plan.

Any potential competition issue can be resolved through auction design.

Q.19: Do you agree with ComReg‟s proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

Qualcomm argues that ComReg's proposal to use two temporal lots for the 900MHz is leading to an increased number of potential transitions in the band, which may hamper the development of services.

Qualcomm proposes to adopt a simpler system that would promote both an efficient use of spectrum and competition. Such a system would be based, but not limited, on the following rules.

1. The 900MHz blocks are separated in three lots. The first lot includes the 925-930 MHz and 930-935MHz blocks, which are guaranteed to be available immediately following the auction. The second lot includes 3 blocks of 2x5MHz guaranteed to be available in 2013. The final lot includes 2 blocks of 2x5MHz guaranteed to be available in 2015. All lots are valid until 2030.
2. All bidders bid on 900MHz blocks as 'abstract blocks', independently of the three aforementioned lots.
3. Should 900MHz new entrants win frequency blocks in the 900MHz band, they have priority on 900MHz incumbents for the allocation of blocks from the first lot (925-930 MHz and 930-935MHz blocks).
4. Should Meteor win spectrum blocks in the 900MHz band, it is assigned the blocks from the third lot (2 blocks of 2x5MHz each guaranteed to be available in 2015) in priority.
5. Once the previous priority rules have been applied, the remaining block winners select the block of their choice following the order from the highest bid to the lowest bid.

6. The price finally paid by the spectrum winner is adjusted depending on the time validity of the blocks won (100% if available in 2011, 27/29 if available in 2013, 25/29 if available in 2015).
7. The introduction of new technology in the blocks is allowed ‘per lot’.

Q. 20: Do you agree with ComReg‟s proposal to issue „preparatory licences‟ to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Qualcomm underlines that, independently of preparatory licences, ComReg’s proposals introduce a minimum two year delay in the introduction of mobile broadband in the 900MHz band and may delay the development of mobile broadband until 2015 due to the spectrum allocation in time-slices.

However, Qualcomm welcomes ComReg’s proposal to try to minimise the deployment delay beyond these self-imposed two years.

7 RTÉ and RTÉNL (including DitiTag document)

RTÉ and RTÉNL Response to the

ComReg Consultation Paper:

800MHz, 900MHz & 1800MHz spectrum release

29th October 2010

Introduction

RTÉ and RTÉNL welcome the opportunity to comment on ComReg's consultation on the release of 800MHz, 900MHz and 1800MHz spectrum (*ComReg 10/71*, 17th September 2010).

Our primary concern is to ensure that UHF terrestrial broadcasting in Ireland is enabled to continue to deliver high quality services to viewers, and to continue to develop after the transition to Digital Terrestrial Television. We believe that further studies and consultation is needed to ensure that services implemented in the 800MHz band do not impact on broadcasting services in the adjacent. These studies need to be completed and conditions surrounding the implementation of 800MHz spectrum need to be formalised before this spectrum can be auctioned.

As many broadcasting organisations share similar concerns with regard to the release of this spectrum, a position statement from DigiTAG, with their permission, is attached as a separate PDF file to this *Response* for consideration also.

It is also noteworthy that the 800MHz band digital dividend is available as a result of a substantial investment from RTÉ and RTÉNL to roll-out digital terrestrial television outside of the 800MHz band. It is to be hoped that that some of the revenue raised from the sale of this spectrum could be used to reimburse/further develop digital broadcasting in Ireland, and to ensure that Irish television audiences are not required to bear any further cost of ensuring adequate reception in the presence of the new spectrum-holders.

Response to Consultation Questions

Q. 1 ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg's proposal? Please provide reasons for your view.

Yes.

Q. 2 ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg's proposal? Please provide reasons for your view.

Yes, but ensuring that the appropriate block edge masks are used in all cases and that additional measures are applied to protect broadcast services operating below the 800MHz band as accounted for in EC Decision 2010/267:

"However, it should be understood that the derived BEMs do not always provide the required level of protection of victim services and additional mitigation techniques would need to be applied in a proportionate manner at national level in order to resolve any remaining cases of interference."

RTÉ and RTÉNL are concerned that no reference has been made to these additional measures, their potential impact on the value of the 800MHz spectrum, their potential cost (in terms of mitigation measures) to future users of 800MHz spectrum, the auction design, and broadcast services in adjacent spectrum.

Mitigation measures being considered in the countries (including the UK[1] and Denmark) as part of the licence conditions on 800MHz spectrum winners could have significant costs:

- Mitigation at the mobile base-station (e.g. additional filtering, polarization alignment, power limitations)
- The supply of filters to broadcast viewers
- The use of on-channel DTT repeaters at the location of the base-station (noting that it may not be possible to implement this in some cases, particularly where a Single Frequency Network is already implemented).

Furthermore, we recommend that a separate entity be set-up, independent of 800MHz licensees, as a point of contact for reports of interference or loss of service, to ensure a prompt resolution for the affected viewers.

This issue is of great concern to those involved in the digital terrestrial TV broadcasting. As already mentioned, a position statement from DigiTAG is attached to this response for consideration. In addition, the response from Broadcast Networks Europe[2] (of which RTÉNL is a member) concerning this issue to a recent RSPG consultation on the Radio Spectrum Policy Programme should also be consulted.

RTÉ and RTÉNL believe that the BEM relating to broadcasting services which must be protected for the lower 800MHz block in EC Decision 2010/267 (Case A) should be applied to all blocks. This is to ensure the protection of the large portion of Ireland where channels in the upper 50s to 60 are currently planned for broadcast use, and potentially the entire country should any future re-planning of broadcasting in the UHF band be undertaken.

While this problem has mainly been considered so far with respect to the effect of mobile down-links on broadcast services, it should also be noted that recent research from Germany[3] has indicated that interference into broadcast services may also arise as a result of mobile uplinks.

Furthermore, the dependence of many Irish viewers on high-gain aerials and mast-head and distribution amplifiers must also be taken into account, noting that digital switch-over in Ireland will largely not affect TV reception set-up (i.e. no need to change aerials).

[1] In the UK the implementation of these additional measures is referred to as the "protection clause" - http://stakeholders.ofcom.org.uk/binaries/consultations/800mhz/statement/clearing.pdf

[2] http://rspg.groups.eu.int/_documents/consultations/comments_rspp2010/bne_rspp_en.pdf

[3] "Summary of conducted measurements on DVB-T interfered with by LTE uplink signals", Media Broadcast GmbH (TDF Group) submitted to ITU Working Party 6A, April 2010.

Therefore, RTÉ and RTÉNL propose the necessity of further engagement and consultation with the industry (including broadcasters) on the intended implementation of the block edge masks specified in EC decision 2010/267, and on adequate additional mitigation measures to protect broadcast services below the 800MHz band before progressing the release of this spectrum any further.

Q. 3 Do you agree with ComReg's proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. However, more work is needed to define an acceptable implementation of 800MHz band spectrum, which could potentially delay the award of the 800MHz band (see Q2 above).

It should also be considered (with respect to the 800MHz band) that this is a large amount of spectrum to be allocated in a single auction, especially given that no equipment is currently available (as referenced in the consultation document).

Q. 4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

The 1800MHz band spectrum should be included as early as possible, and ideally should be auctioned before the 800MHz spectrum to ensure efficient use of existing mobile spectrum before allowing it to expand.

The concept of Digital Dividend should also apply equally and proportionally to existing mobile bands, and existing users of these bands should first optimise use of their existing spectrum before expanding, particularly where this expansion would have an effect – and cost – on other licensed spectrum users (i.e. broadcasters).

Q. 5 Do you agree with ComReg's Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

Yes.

Q. 6 Do you agree with ComReg's proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

No comment.

Q. 7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg's statutory functions, objectives and duties.

No comment.

Q. 8. Do you agree with ComReg's proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

No. In relation to the 800MHz band, a spectrum cap could prevent an operator (who for example only won spectrum in the lowest 800MHz blocks) from availing themselves of the option to plan their spectrum usage on a geographical basis to help mitigate interference into broadcast services below the 800MHz band.

The auction should be structured such that the higher frequency blocks are auctioned first, so that if demand is not as high as expected, then broadcast services will not be impacted adversely.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

No. If a spectrum cap is to be applied it should be higher than 2 x 20MHz, or linked to the allocation of the lowest block such that winners of lower block will have access to higher blocks also (see Q8 above).

Q. 10. Do you agree with ComReg's proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. An auction with a suitably defined reserve to ensure that the lower 800MHz blocks are only taken up if demand is particularly strong is better, as these are most likely to impact existing broadcast services in the 800MHz band.

An auction may also be most likely to raise sufficient funds to cover the costs of mitigating against interference into broadcast services (e.g. supplying and fitting filters in viewers' homes, cf. Q. 2 above).

Q. 11. Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view. 800 MHz, 900 MHz & 1800 MHz spectrum release 76 ComReg 10/71

RTÉ and RTÉNL agree that two temporal lots broadly mirroring the 900MHz band would be the best option, noting that the first 800MHz lot would not be available in line with the first 900MHz block as per *ComReg 09/99*. The first 800MHz temporal lot should involve the higher lots (i.e. further away from the broadcasting band), allowing the winners of the lower lots more time to develop and deploy interference mitigation measures (also allowing more time for more effective and cost effective filter technology to become available).

Q. 12. Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

No comment.

Q. 13. Do you agree with ComReg's proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking

exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

No. RTÉ and RTÉNL believe that the lower 800MHz block should have their minimum price set higher than the upper 800MHz block and 900MHz blocks to ensure that they are only taken up if demand is particularly high: thus avoiding any unnecessary impact on broadcasting services.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

No comment.

Q. 15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market.
Do you agree with ComReg's proposed coverage and roll-out obligation? Please provide reasons for your view.

No. A roll-out obligation on the lower 800MHz blocks would encourage licensees to deploy their networks in the Dublin and east coast areas early in their network roll-outs to meet coverage targets. These areas are among those where broadcasting services are most susceptible to interference due to the broadcast frequency plan.

While geographic roll-out obligations could be designed to limit early implementation of the lowest blocks in areas where broadcasting services are most vulnerable to this new type of interference, this would most likely be viewed as being over-prescriptive.

Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.
Do you agree with ComReg's proposed quality of service obligations? Please provide reasons for your view.

No comment.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.
Do you agree with ComReg's proposed miscellaneous obligations? Please provide reasons for your view.

Yes for NIR.
However, emergency service access implies voice services which may limit licensees in how they would like to use the spectrum.

In addition, the application of emergency service obligations in a frequency band with known, but not fully understood, incompatibility issues with high power services in an adjacent band would be unwise in case interference problems emerged.

Q. 18: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

No comment.

Q.19: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

Yes, however the transitional issues, including the MoU suggested, should be extended to include broadcast licensees – particularly in relation to interference into broadcast services.

Q. 20: Do you agree with ComReg's proposal to issue "preparatory licences" to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. In addition we note that extensive testing would be required to ensure that mitigation techniques to protect broadcasting services are performing as expected, noting that testing and field trials are currently being undertaken in other European countries to help understand the extend of the impact on broadcast services (e.g UK, France, Germany, and Spain).

RTE and RTÉNL, 29th October 2010.

Necessary measures for limiting the potential interference to Digital Terrestrial Broadcasting Services in the 470-790 MHz frequency UHF band from mobile/fixed communications networks (MFCN) operating in the 790-862 MHz frequency band

DigiTAG (the Digital Terrestrial TV Action Group)

considering:

a) the importance of the societal role and economic value of terrestrial broadcasting in Europe;

b) the Digital Dividend resulting from the migration of terrestrial broadcasting from analogue to digital technology;

c) the decisions of National Administrations of Member States, following switch off of analogue terrestrial television services to allocate the 790-862 MHz frequency band (the 800 MHz band) for mobile/fixed communications networks (MFCN);

d) the European Commission decision on harmonized technical conditions of use of this frequency band in the European Union (2010/267/UE);

e) the ECC Report 148 on measurements on the performance of DVB-T receivers in the presence of interference from mobile/fixed communications networks (especially LTE);

f) the various studies made in several European Countries based on the figures contained in the above referenced reports;

g) the proposal for a decision submitted by the European Commission to the European Parliament and Council for establishing the first Radio Spectrum Policy Programme;

and observing:

a) that the implementation of MFCN in the 790-862 MHz frequency band may cause severe disturbance to Digital Terrestrial Television (DTT) Services primarily in terms of signal to noise degradation and/or overload of TV receiver input stages as well as of antenna mounted amplifiers. As a consequence, the quality of reception of DTT Services in the 470–790 MHz band may be severely impaired unless appropriate measures to eliminate harmful interference are taken by Regulators and Administrations in Europe when awarding frequencies for MFCN in the 800 MHz band;

b) that the parameters in annex to the EC decision 2010/267/UE offer different levels of protection for DTT depending upon the case considered;

c) that the EC decision 2010/267/UE (Article 2, second paragraph) states that Member States shall ensure that the new systems in the frequency band 790-862 MHz provide appropriate levels of protection to systems in adjacent bands, e.g. DTT services;

d) that even when the most stringent block edge mask, as defined by CEPT to limit radio frequency emission from mobile service Base Stations into the TV band, is put into place, interference may occur in the absence of additional mitigation measures (CEPT Report 30, Executive Summary, paragraph 6);

e) that Channel 60 (782-790 MHz) is part of the band allocated to DTT and is already used to deliver DTT Services. Furthermore, Channel 60 is assigned to stations recorded in the GE06 Plan and has to remain fully available for future DTT use in the case of GE06 evolution;

are of the opinion that, in order to provide an appropriate level of protection to DTT services below 790 MHz with respect to emissions from mobile/fixed communications networks (MFCN) operating within the 790-862 MHz band, the following protection measures should be required by Regulators at an early stage, prior to the award of licences for use of the spectrum:

a) the most stringent level (baseline requirement in case A) defined in EC decision 2010/267/EC has to be applied to all spectrum below 790 MHz everywhere;

b) additional mitigation measures shall be required as necessary to be put in place by Mobile Wireless Broadband Services license holders to ensure full protection of DTT services. The basis for this protection should be a pre-emptive and careful network planning by the MFCN operator to avoid as far as possible situations that may create interference to the reception of DTT. Associated costs of necessary remedies shall not be borne by broadcasters, broadcast network operators or the viewers. Depending on the actual situation, these measures may include but are not be limited to:

- reducing the power of the MFCN transmitters and adjusting their antenna characteristics to reduce interference problems, taking into account local conditions, in particular for the MFCN Base Stations using the first frequency block above 790 MHz;
- using a Base Station antenna polarisation that is orthogonal (different) to that of the DTT transmitter, in particular for Base Stations using the first frequency block above 790 MHz;
- use of additional RF filtering at MFCN Base Stations, in particular for Base Stations using the first frequency block above 790 MHz;
- use of on-channel low-power DTT repeaters at the MFCN Base Stations to restore the degradation of signal to noise ratio at impaired DTT receivers. Such remedies should be closely coordinated with the impacted broadcast multiplex operator, since it may not always be easily applicable, e.g. in case of DTT transmitters operating in a Single Frequency Network (SFN);

c) The Regulators granting frequencies in the 800 MHz band and their respective Administrations should further consider the following additional measures:

- the setting-up of an independent body (as a point of contact) to which cases of interference or loss of DTT service can be reported, to ensure a prompt and effective resolution. In addition this body should have access to the necessary funds and resources to implement appropriate remedies. The response time must be very short – in the order of hours, not days. In the meantime, pending the implementation of measures for resolution of interference, the source creating it should be turned off;
- to ensure, or delegate this assurance to the independent body when created, that consumers experiencing loss of DTT service, even after mitigation measures

mentioned above have been implemented, are promptly provided with adequate equipment to allow continued reception of DTT services. Such equipment may include, but shall not be limited to, appropriate filters connected in front of the DTT receiver or receiving antenna amplifier system to eliminate harmful interference stemming from emissions in the frequency band 790-862 MHz. In any case, such measures must not impair reception of channel 60. The associated costs of these necessary remedies shall not be borne by broadcasters, broadcast network operators or the viewers;

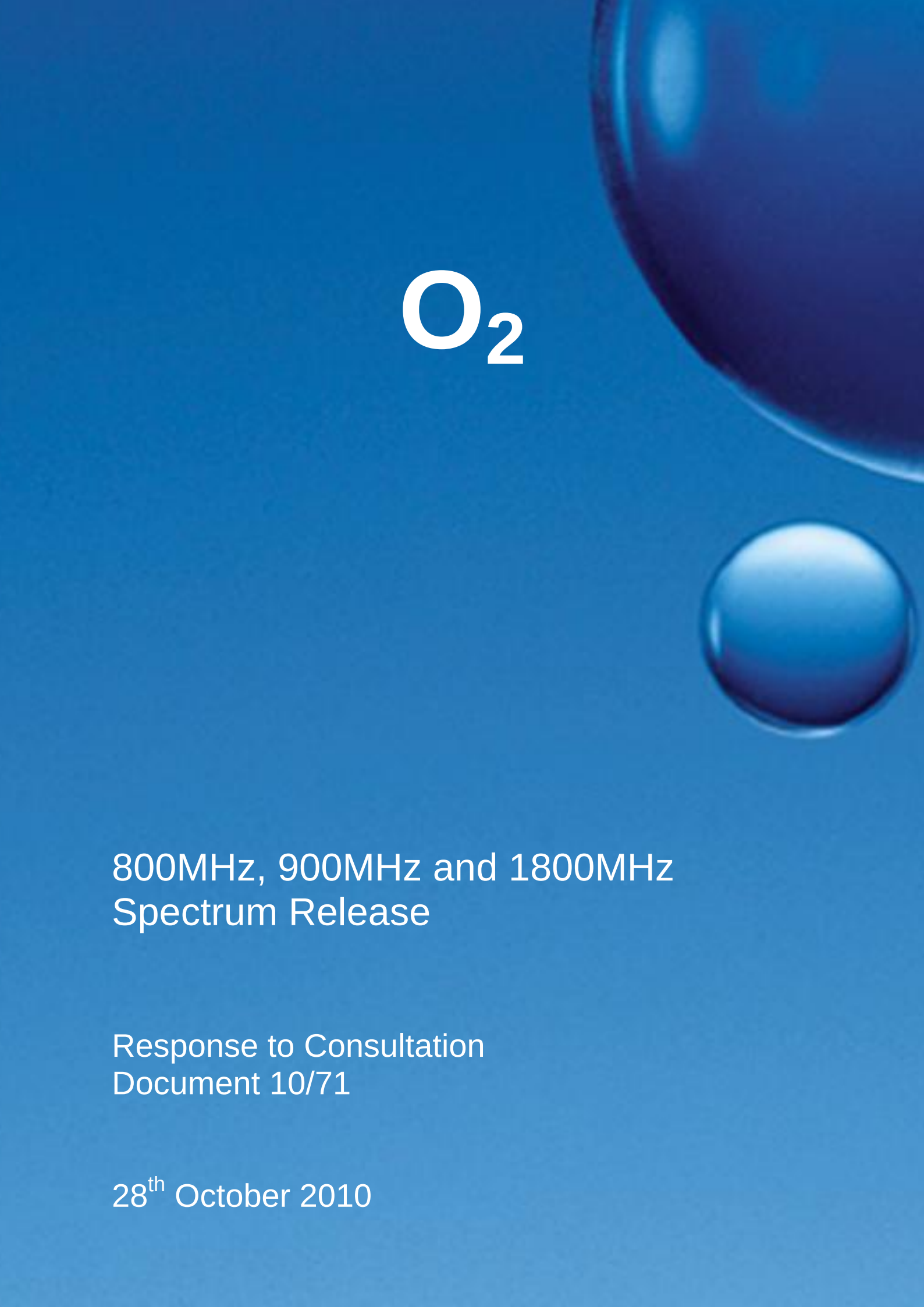
- any other actions necessary for circumstances when the above measures have proven ineffective.

d) It is highly recommended that, prior to setting up the above protection measures, Regulators and their respective Administrations should organise field trials to observe the 'real world' impact of the deployment of mobile/fixed communications services versus the results of theoretical models utilised for prediction purposes.

The DigiTAG members are fully open for cooperation with Administrations, Regulators, and all parties interested in the use of the 800MHz band for purposes other than broadcasting, in the context of the above opinion.

4 October 2010

8 Telefonica O2



800MHz, 900MHz and 1800MHz Spectrum Release

Response to Consultation
Document 10/71

28th October 2010

1. Introduction

1.1. This is O2's response to ComReg document 10/71 - the fourth in a series of consultation documents to address liberalisation and licensing in the 900MHz band. O2 acknowledges from the outset that ComReg has considered many of the points raised by it in response to the third consultation (the "**O2 09/99 Response**"), and O2 considers that the latest ComReg proposals address many of the concerns raised by O2 and the industry, when compared to the proposals in ComReg's document 09/99. In particular O2 welcomes the proposal to auction 800MHz and 900MHz spectrum together, to grant the necessary interim licences to O2 and Vodafone, and to move away from a sealed bid auction format. O2 is cognisant of the efforts made by ComReg, the Department of Communications, Energy and Natural Resources and the Broadcasting Authority of Ireland in facilitating the release of 800MHz spectrum at this time. If effectively implemented, the release of 800MHz and 900MHz spectrum in 2013 will keep Ireland "on par" with other European countries in terms of next generation wireless technologies.

1.2. There remain aspects of ComReg's latest proposal that O2 does not agree with and that O2 believes do not meet ComReg's legal obligations, in particular the requirement that it proceeds in a manner that has the least adverse effect while achieving its objectives. This response is intended to assist ComReg by raising those aspects about which O2 has concerns, setting out O2's general position on ComReg's proposals, and responding to the specific questions raised by ComReg. Throughout the response, where O2 has identified specific areas of concern, it has made proposals to assist with the particular issue.

2. General Comments

2.1. As mentioned above O2 acknowledges that ComReg has considered many of the points raised in the O2 09/99 Response. In particular, we would highlight the following matters where ComReg's proposal represents a significant improvement on its previous proposals:

2.1.1. *Combined 800MHz and 900MHz licensing process*

O2 considers that the 800MHz and 900MHz bands are close substitutes and that it is appropriate that both should be assigned in a single process. O2 and the industry has long called for a holistic approach to spectrum assignment and welcomes ComReg's move to award licences in both of these bands at the same time

2.1.2. *Interim Licences*

As ComReg acknowledges, licence continuity for O2 and Vodafone is a necessary precursor to any proposal for a joint auction process for 800MHz and 900MHz spectrum. It is welcomed that ComReg finally recognises that allowing the expiry of the existing licences without interim measures should be "discounted as a viable regulatory option". ComReg has correctly acknowledged the risks that operators and consumers would face if the current 900MHz licences had simply expired in 2011 without ensuring continued access to 900 MHz spectrum for the current GSM

networks. Without prejudice to O2's position as outlined in the 02 09/99 Response on the nature and term of the 900MHz licence that it is legally entitled to post-2011, O2 supports the principle of ComReg moving towards interim licence arrangements. However O2 believes some modifications to the proposed arrangements are required, details of which are set out in the response to Question 5 below.

2.1.3. *Transition Mechanism*

ComReg has rightly identified some practical transition issues that might arise, depending on how the final assignments fall. In general, at this point in time, the proposals appear appropriate.

2.1.4. *Auction Mechanism*

ComReg has taken into consideration the comments made regarding the single-round sealed-bid auction, and has instead proposed a combinatorial clock auction (CCA). Without prejudice to O2's position as outlined in the 02 09/99 Response on the appropriateness of an auction at all to determine assignments, O2 believes that a CCA is a better alternative than the sealed bid, subject to our comments on the auction mechanism itself as set out in the response to Question 12 below.

2.2. There are also a number of proposals in the ComReg document 10/71 that O2 would strongly disagree with, and that conflict with ComReg's legal functions and objectives. These will be examined in detail in the individual question responses, however in particular we would highlight the following:

2.2.1. *Minimum Price*

O2 welcomes ComReg's reduction of the minimum price from the amount in previous consultations however it remains too high. It is O2's position that the minimum price proposed by ComReg has been incorrectly determined, and is excessive. The high minimum price proposed gives rise to the risk that demand will be stifled and valuable spectrum will remain unallocated following the auction process. ComReg has legal and policy obligations to ensure the efficient management of radio spectrum and having unallocated spectrum (that would have been sold had an appropriate minimum price been adopted) at the end of this process would represent a failure by ComReg to meet these obligations. Equally any purchase of spectrum at the proposed minimum would represent a failure to meet ComReg's objectives as a result of the damage it will do to purchasers and in particular to their capacity to invest in their networks, as set out in more detail in the response to Questions 13 and 14.

2.2.2. *Interim Licence Duration and Price*

For practical purposes as well as legal reasons, the duration of the interim licences should be modified (at least for 2x5MHz) to 2015. In addition O2 specifically disagrees with the method used to determine the interim licence fees, and considers that it is in breach of ComReg's obligations, discriminatory and in breach of the EU rules on State Aid.

2.2.3. *Licence Conditions – Billing*

O2 does not agree with ComReg's proposed licence condition in relation to billing, however does not propose to address the issue at this stage of the consultation. This matter is subject to separate consultation to take place in December 2010 as stated in ComReg Information Notice 10/88. O2 does not wish to pre-empt the process or outcome of that separate consultation. ComReg is however fully aware of O2's position with regard to e-billing.

2.3. There are a number of other positions adopted by ComReg which although O2 is in agreement with, it has specific concerns around their implementation, including:

2.3.1. *Timing – Need to proceed with interim licences immediately*

Given that O2 and Vodafone's GSM licences are due to expire in May 2011, there is an urgent need to confirm immediately that interim licences will be issued, if ComReg is to avoid the serious risk of uncertainty and disruption for both consumers and operators. It is extremely unlikely that ComReg will complete the present consultation and assign spectrum prior to May 2011, given that it has already spent over two years in consultation, and considering both the process that ComReg and operators must go through and the range and complexity of the issues that must be addressed in order to complete this consultation. Delay is particularly likely in circumstances where its latest proposal is so materially different to its last and ComReg will need to consider responses to it, and most likely engage in further consultation prior to any Decision. The issue of granting an interim licence however is a net and isolated consideration. It can be dealt with quickly and efficiently, and is not dependent upon the outcome of the remainder of this consultation as a whole. O2 has previously indicated on numerous occasions in the O2 09/99 Response and in correspondence since then the urgency of this issue. For that reason, ComReg can and must prioritise this matter, and proceed immediately to provide certainty regarding interim licences. O2 require this issue to be clarified, and a Decision published by December 2010 giving legal certainty that an interim licence will be granted in advance of May 2011 in order to protect itself and ensure business sustainability. It is not a legal or business option for O2 to enter the 2011 year without certainty on this matter, and O2 fully reserves its rights in that regard.

2.3.2. *800MHz Availability*

O2 supports ComReg's proposal to make the 800MHz band and 900MHz band available for assignment in a single process. ComReg is responsible however, in proposing to auction 800 MHz on the basis of availability from 2013, to ensure before it proceeds to auction that the 800MHz spectrum will in fact be available when that time comes. There can be no uncertainty or risk relating to the availability of the 800MHz band from the proposed start date. Auction participants can not seriously bid on lots of 800MHz spectrum if there is any uncertainty about, or risk of, delayed availability.

3. Long term view of the industry and the need for flexibility

3.1. In addition to the above general comments, O2 believes ComReg should, and is legally required to, take a long-term view of the industry, its requirements and evolution when forming its licence conditions and assignment process. The licences are in effect to be assigned for a period of 17 years, and it is essential that ComReg build in sufficient flexibility for them to cover such a long period, and not inhibit the ability of the industry to evolve to meet, and indeed survive, the challenges ahead. These challenges are already evident with declining revenues, , changing customer demand, rising network costs and competition from new services. While it might not be possible to predict the licence requirements too far in advance, it is already clear that greater flexibility will be required than has been provided for in the past. In particular, the licences should provide for service and technology neutrality, be tradable, allow for spectrum sharing, and be open-ended to ensure continued investment.

3.2. In structuring the proposed auction mechanism ComReg must facilitate and not inhibit this essential flexibility for the industry. In particular the auction mechanics must not inhibit spectrum trading or spectrum sharing. They should not restrict flexibility in the approach to acquiring spectrum licences by prohibiting approaches other than single operator bids – for example joint bidding by a consortium of companies. The rules should also ensure the availability of sufficient quantities of spectrum to such bidders, who may have greater demands for spectrum, including above the proposed spectrum cap. O2 specifically requests ComReg to address this issue in the present consultation process when consulting on the auction mechanism.

4. Alignment of Licences

4.1. In any auction or other assignment procedure, ComReg needs to ensure that the current Meteor licence for 7.2MHz until 2015 neither confers a competitive advantage nor creates an inherent inefficiency within the assignments. O2 notes that the trend in other European countries is to extend licences to create a uniform expiry date. O2 has made a proposal in this regard as detailed below in its Response to Question 5.

5. Reservation of Rights

5.1. In O2's 09/99 Response in particular, and in previous responses, we detailed the basis upon which O2 is entitled at law (e.g., under the doctrine of legitimate expectation), to have its current 900MHz licence extended or renewed in accordance with the undertaking given by ODTR (ComReg) in its 2001 Information Memorandum. We further detailed the legal basis upon which a spectrum allocation process that built in a risk that the existing operators would not obtain spectrum without giving a period of at least 4 years notice to those operators, constituted a breach of ComReg's own obligations, functions and objectives. The present proposal does not address either of these issues. O2 considers that the concerns under

these headings remain valid. In the circumstances O2 has no option but to reiterate those concerns by reference in particular to the relevant sections of O2's 09/99 Response, and must fully reserve its rights in relation thereto, including to object to any ultimate Decision of ComReg. O2's comments in this document in relation to ComReg's current proposal are entirely without prejudice to O2's position on these and other issues. Although O2 welcomes some of the proposals in ComReg's latest consultation, that is insofar as the proposals have moved on from those in ComReg's third consultation and not because they necessarily address the legal concerns that O2 has outlined in its previous responses.

5.2. More generally O2 has provided responses to the three previous consultations, and in those responses raised detailed concerns about ComReg's proposals as they stood at that time. O2 continues to fully reserve its rights to continue to raise all concerns and objections raised in all of its responses, and in correspondence with ComReg during the consultation process, including in the event of O2 objecting to any ultimate Decision adopted by ComReg. O2 must also fully reserve its right to seek an indemnity against losses caused by ComReg or by the State as a result of it proceeding with any aspect of this proposal that is unlawful.

5.3. Further, the public record demonstrates that objections have been raised by many other interested parties by way of their responses to ComReg's consultations to date. O2 fully reserves its rights to raise concerns similar to those raised by such other operators in their responses which equally impact upon the position of O2 and the industry more generally including in the event of O2 objecting to any ultimate Decision adopted by ComReg.

5.4. Finally, O2 must also fully reserve its position with regard to the limited amount of time that has been provided to O2, and the industry, to deal with ComReg's latest proposal and the consultation process as a whole. We refer to section 2.8 the 09/99 Response in that regard. In light of the imminent expiry of O2's 900 MHz licence and the urgent need to immediately proceed to a grant of an interim licence, O2 has not sought an extension of time to respond to this latest proposal. However, we must therefore reserve the right to supplement this response with further comments at any time.

Q. 1 ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg's proposal? Please provide reasons for your view.

O2 Response 1

O2 agrees with the proposal that the 800MHz band should use the Frequency Division Duplex (FDD) mode of operation and that the channel layout should be as described CEPT Report 31. Clearly, this is an area where a decision must be made early by ComReg so that the band can be divided into appropriate lots for licensing. O2 believes FDD will deliver the most efficient use of the 800MHz band, taking into account a number of different considerations, including:

(i) The CEPT Report and EC Decision tend to favour FDD mode of operation and as a result it is likely to become the *de facto* standard arrangement across Europe.
(ii) Indications from other European countries that have already assigned or are preparing to assign the band (e.g. Germany) are that licences will be issued for FDD operation.
(iii) A wider range of standard network and end-user equipment is likely to be available for FDD than TDD operation.

FDD is the most widely used technique globally in wireless cellular networks. It is the standard for GSM and WCDMA. Keeping FDD for the new services deployed in the 800MHz band will help to ensure affordable handsets and devices are available for use in the Irish market.

Q. 2 ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg's proposal? Please provide reasons for your view.

O2 Response 2

O2 agrees with the proposal to apply the block edge masks as described in the EC Decision to licences issued in Ireland. There are no special circumstances that would warrant a divergence from that standard in Ireland, and standard equipment will be manufactured according to that specification. Manufacturers are unlikely to be interested in supplying equipment to a different specification for the Irish market alone. Furthermore the block edge mask has been optimised for mobile communication network using FDD or TDD.

***Q. 3 Do you agree with ComReg's proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view*.**

O2 Response 3

Joint Award

O2 agrees with the proposal to award both 800MHz and 900MHz in a joint process. This is something that O2 has called for throughout the 900MHz consultation process. ComReg should take a holistic approach to the way in which it manages and releases spectrum in Ireland. This is particularly the case where certain bands are potentially substitutable for each other, as is the case for 800MHz and 900MHz.

There are good reasons for ComReg to make an early award of the 800MHz band for Electronic Communications Services, and in light of the recent developments regarding the launch of Digital Terrestrial Television (DTT) in Ireland and analogue switch off (ASO), it is now appropriate for ComReg to proceed to assign this spectrum at the same time as the 900MHz. These considerations have been examined separately by ComReg in its consultation on the Digital Dividend (09/15 & 09/81), but include benefits for both consumers and the industry by making available spectrum below 1GHz that could be used to expand mobile broadband coverage and facilitate competition.

It simply would not be appropriate to hold an award process for 900MHz in 2011, and then immediately or shortly after that commence a second process to award 800MHz. O2 believes that from a practical point of view it would not be possible to hold two assignment processes in quick succession, which would mean that any award of the 800MHz spectrum would be delayed. This would deprive the Irish industry of the opportunity to take early advantage of the Digital Dividend, and delay the resulting consumer benefit.

To award the 800MHz and 900MHz bands separately would create uncertainty for applicants and would hamper an efficient assignment outcome. This will particularly be the case where the spectrum is to be assigned by auction, as bidders will want to be able to switch between lots in each band as the auction progresses. This issue has previously been examined by DotEcon for ComReg who has stated that where lots are substitutes they should be sold together as the value of each lot depends on the price and availability of the substitute.

To separate the 800MHz and 900MHz award processes would create uncertainty and limit the spectrum available for licensing at any one time, creating an artificial scarcity of supply of spectrum available in the award process. In an auction this factor would have an undue influence on the outcome of the process. O2 agrees with ComReg's view that holding separate auctions in succession would give rise to speculative bids in the first band auction based on expectations about the value of spectrum in the other band, which could be inaccurate.

O2 acknowledges that awarding the spectrum from both bands in a single process would also serve to reduce (while not eliminating) one of the serious risks identified by O2 in ComReg's previous

proposal. To award 900MHz spectrum on its own would place O2 at risk of auction manipulation, as other bidders would be aware of O2's requirement to retain at least 1 lot simply to maintain current GSM service. The addition of an extra 6 lots in the auction process increases the risk to a rogue bidder in attempting to manipulate the auction process in this way.

Secure Availability of 800 MHz spectrum from January 2013

O2 has concerns regarding the availability of the 800MHz spectrum that ComReg must alleviate if it is to hold a successful and legally compliant award process. If operators are to enter an auction where lots of both 900MHz and 800MHz are being sold, then they of course must have certainty that the spectrum being sold will be available and unencumbered on the promised date (i.e. January 2013).

O2 is aware that the Minister for Communications, Energy, and Natural Resources has signed an order under Section 129 of the Broadcasting Act 2009 requiring RTE to commence transmission of Digital Terrestrial TV to 90% of the population by 31st October 2010, and a National Service by the end of 2011. The Minister has also stated his intention that analogue switch-off (ASO) should occur no later than Quarter 4 of 2012. No guarantee or statutory confirmation has in fact been provided. This is a cause for concern, as there remains the possibility that ASO could be delayed past Quarter 4 2012, which would in turn delay the availability for use of 800MHz for Electronic Communications Services beyond the January 2013 start date proposed by ComReg.

In preparing to auction 800MHz and 900MHz spectrum together, it will be ComReg's responsibility to ensure that the 800MHz spectrum can in fact be licensed by it on the terms it proposes, and to identify in this consultation process the steps it needs to take to secure the availability of that spectrum to licensees. O2, along with the industry will by relying upon ComReg to take all necessary steps prior to the auction to ensure that it is in a position to grant the licences it is proposing to auction. O2 considers that this will involve the completion of a number of tasks including but not limited to the following:

(i) bringing this matter to the Minister's attention and ensuring statutory certainty regarding the date for completion of the ASO ahead of January 2013;
(ii) publishing details of all current use of the spectrum within the 800MHz band, and the detailed plan for switch-off per site; and
(iii) addressing any issues relating to co-ordination with ASO in Northern Ireland that might impact on the availability of the 800MHz band from January 2013.

ComReg's proposals with regard to the above three issues, and in particular how it is going to deliver on issue (i) should be published as part of this consultation process, before it makes a final decision and/or proceeds to auction.

Q. 4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

O2 Response 4

O2 has repeatedly stated throughout a number of spectrum consultations that operators need to be able to plan their spectrum utilisation across a number of different bands, and that ComReg should facilitate this by taking a holistic approach to spectrum assignment.

Ideally, the date for availability of all bands of interest (800MHz, 900MHz, 1800MHz, 2.1GHz, 2.3GHz, 2.6GHz) would be clear and the maximum number of bands would be made available in a single process. In practice, it may not be possible to make all bands available at the same time, or even to provide absolute clarity regarding availability. In this case, ComReg should seek to group together bands that are near substitutes for each other. There is a clear division between bands above and below 1GHz, with those above having greater capacity, but those below being preferred for coverage.

Clearly the 800MHz and 900MHz bands are close substitutes for each other and it is appropriate that they should be assigned together. By the same token, the bands above 1GHz would also be grouped together and awarded together, however in practice this is not likely to work in the short term in Ireland because:

(i) 2.1GHz is assigned and out of consideration in the short to medium term.
(ii) 2.3GHz is not a standard band and so questions arise regarding the availability of European standard equipment. In addition it is a TDD only band, which has not been as sought after as FDD spectrum.
(iii) 2.6GHz is currently in use for MMDS, and is subject to a review by ComReg. Earliest availability would seem to be 2014, when the second of the current MMDS licences expire.

The most appropriate approach would be to hold over the 1800MHz band for a combined assignment in a single process involving the 2.3GHz and the 2.6GHz bands.

On this basis, O2 believes ComReg should hold over the award of the 1800MHz band until there is clarity regarding the availability of the 2.6GHz band (subject, however to resolving the matter well in advance of the expiry of current 1800 licences). It could then be assigned in a single process that includes 1800MHz, 2.3GHz, and 2.6GHz.

Q. 5 Do you agree with ComReg's Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

O2 Response 5

Interim Licence

O2's position is that an interim licence or extension of its current 900MHz licence is a necessity and a legal entitlement. ComReg has the statutory power to issue such a licence, and to grant it is consistent with and indeed is the only course of action in all of the present circumstances that complies with ComReg's functions and objectives. As ComReg acknowledges, interim licences are necessitated by the current exceptional circumstances that justify an urgent need to act[1] and more particularly because of:

- the imminent expiry of the existing licences in May 2011;
- the fact that the new, liberalised licences are extremely unlikely to have even been allocated prior to May 2011;
- that the new licences will certainly not be ready to begin operating by May 2011 (even in the 900 MHz band) given the minimum lead times involved for any new licences, even in retuning existing networks (as acknowledged by Red-M and Vilicom);
- the fact that in order to efficiently allocate sub-1GHz spectrum in the manner proposed, the new licences will not in fact be available until January 2013; and
- the fact that therefore the only way to avoid massive disruption and ensure continuity of service to customers and of competition in the industry is to grant interim licences as proposed.

O2 therefore welcomes ComReg's recognition of the requirement for such an interim or extended licence as the industry transitions to liberalised licensing.

Statutory powers to grant, extend and amend licences

In ComReg document 10/71 at section 3.2.4 ComReg refers to its specific powers under Regulation 11 of the Authorisation Regulations to grant licences. O2 notes that ComReg also has the power to grant wireless telegraphy licences and impose licence conditions pursuant to sections 5 and 6 of the Wireless Telegraphy Act 1926 (as amended). ComReg has, under section 6 of the 1926 Act (as amended by the Communications Regulations (Amendment) Act 2007), a wide discretion with regard to licences and, for example, has the power to prescribe the period of such licences, renewal terms, and provide for any other matter relating to such licences as necessary or desirable. Furthermore, ComReg may also make amendments to existing licences pursuant to section 6 of the GSM Mobile Telephony Licence (Amendment) Regulations 2003. This section provides that ComReg may make amendments to any licence once granted, (which arguably should cover subsequent amendments to an interim licence if one was granted), in the interest of the efficient and orderly use of apparatus for wireless telegraphy.

Reference should also be made to Regulation 20(8) of the Framework Regulations 2003 which provides that ComReg may, in exceptional circumstances, by way of derogation from the normal consultation procedure, in order to safeguard competition and protect the interests of users, immediately adopt a proportionate measure on a provisional basis. The expiry of GSM licences in

[1] Regulation 20(8) Framework Regulations 2003

May 2011, without an appropriate procedure for licence renewal, is not in the interests of users. The granting of an interim licence is a proportionate measure to safeguard against that and ComReg is not obliged to go through the consultation process to adopt such a measure. Indeed, this and the previous two consultations should suffice in that regard and O2 submits that there is no need for further consultation on this particular point.

Based on the above it is clear that ComReg has the power to grant the necessary interim licences to O2 and to Vodafone, and to do so without further delay.

Duration of Interim Licence

Having established that an interim licence is required, and that ComReg has the power to issue one there are a number of further decisions to be made regarding the conditions, duration, and licence fees to be applied. O2 agrees with ComReg's proposal that there should be a single commencement date for licences for new spectrum allocated in the 800MHz and 900MHz bands. On this ground alone the logical and minimum required extension to be granted to Vodafone and O2 would be for the current spectrum (2x7.2MHz each) until 2013.

O2 recommend a modification to ComReg's interim licence proposal and refer back to the 02 09/99 Response. In section 13, O2 proposed that both O2 and Vodafone should be granted extensions of their current 900MHz licences for at least 2x5MHz each up to 2015. This would allow the expiry of these interim licences to coincide with the expiry of Meteor's current GSM licence thereby giving a common date for release/reassignment of the relevant spectrum. It would go some way towards dealing with O2's identified legitimate expectation of licence continuation on a demonstrable need basis (albeit not fully addressing that legal right, and O2 hereby continues to reserve its position in that regard). It would ensure that all existing GSM operators had a minimum of 4 years from auction outcome to transition their networks in the event of loss of spectrum (identified as a legal and practical requirement in O2's 09/99 Response). It would address the imbalance inherent in allowing Meteor as the only GSM operator to enter an auction with the advantage of guaranteed 900 MHz spectrum until 2015 (described in greater detail in section 13 of O2's 09/99 Response). The proposal for a reduction to 2x5MHz had been contingent upon being given sufficient advance notice to plan and implement network re-configurations necessary to reduce down to 2x5MHz.

Accordingly, given the current circumstances, O2 requests ComReg to grant to O2 (and Vodafone) an interim licence which should be for:

- the currently assigned 2x7.2 MHz from May 2011 to January 2013;
- reduced to 2x5MHz from January 2013 to 2015.

It is assumed that ComReg will encourage Meteor to relinquish 2x2.2MHz of its current 2x7.2MHz from January 2013. This would give a uniform availability sub-1GHz liberalised spectrum in ComReg's assignment process of:

- 10 lots of 2x5MHz available from 2013 to 2010

- 3 additional lots available from 2015 to 2030

A review of 900MHz licences would seem to indicate that the trend throughout Europe where 900MHz licences expire is to grant extensions so as to ensure that all current licences expire concurrently (e.g. Netherlands, Spain, Switzerland, etc.).

Timing of Decision – Requirement to immediately proceed to grant of interim licence

O2's existing licence is due to expire in just over six months in May 2011. It is essential that an appropriate interim licence is granted to O2 as soon as possible and without any further delay. A Decision must be published by December 2010 providing legal certainity that an interim licence will be granted prior to May 2011, if ComReg is to avoid the serious risk of uncertainty and disruption for both consumers and operators.

O2 is extremely concerned that the scale and complexity of the present consultation process means that it is unlikely to be completed and a final decision published until well into 2011 at which point it will be too late. ComReg has already issued four consultation documents in the process to determine how to assign the spectrum in the 900MHz band, and has been consulting on that particular issue for over two years. There are now many additional issues to be considered in this consultation process. The size and scope of this consultation has grown considerably, and seems set to continue to do so as 800MHz has been added in and possibly 1800MHz also. In addition there are the new issues arising from the proposed auction mechanics to the proposals for licence conditions under review. There is also the risk of a delay in implementation if any aspect of ComReg's ultimate Decision becomes the subject of a legal challenge, meaning that ComReg must take the appropriate time to ensure that it designs a process where that possibility does not arise.

On the other hand, the issue of granting an interim licence is a net one, and not dependent upon the outcome of the remaining more complex issues in the consultation. ComReg will have carried out more than sufficient consultation on the point by means of the present round of submissions, particularly bearing in mind the urgency of the situation. However ComReg in any event, as outlined above, has the necessary powers to grant provisional licences in such circumstances without any requirement for consultation.

For all of the above reasons, ComReg can and must prioritise the grant of an interim or extended licence. It should separate this decision from the main consultation on the auction proposal and proceed immediately to a Decision giving certainty that an interim licence will be granted. This will reduce the time pressure on ComReg in respect of the main consultation, allowing it to take the time needed to fully consider all. O2 requires certainty in relation to licence continuity to protect and sustain its business, and will require legal protection in the event this issue is delayed beyond that timeframe. The issue simply cannot wait until the end of the consultation process.

Interim Licence Conditions

O2 agrees that the conditions attached to the interim licence should replicate the current relevant conditions that apply for each of O2 and Vodafone – this is essentially a continuation/extension of the current licensed services for a limited time only. It would be disproportionate and inappropriate to expect an operator to implement any significant network or service modifications for such a short period.

Q. 6 Do you agree with ComReg's proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

Q. 7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg's statutory functions, objectives and duties.

O2 Response 6& 7

O2 does not agree with ComReg's proposal, and believes it to be flawed in several fundamental aspects. CPI is not a relevant index to apply to spectrum licences; the proposed interim licence fee is excessive and would be in breach of ComReg's statutory obligations; and also in breach of EU State Aid law.

Vodafone and O2 Interim Licences are identical

ComReg is proposing to grant to both Vodafone and O2 a licence to use 2x7.2MHz of spectrum in the same band for the same time, and under essentially the same terms and conditions - except for the price. Given that the licences being granted are essentially the same, the licence fee charged by the State for such licences should also be identical however ComReg is proposing a higher fee for O2 for the use of what amounts to identical spectrum.

ComReg's Obligations

ComReg's obligations of relevance to spectrum assignments are set out *inter alia* in the Communications Regulation Act, 2002 (the "2002 Act"), the Framework Directive 2002/21/EC as amended (and Framework Regulations 2003), the Authorisation Directive 2002/20/EC as amended, and Authorisation Regulations 2003 and the Wireless Telegraphy Act 1926 as amended. These obligations were examined in detail in the O2 09/99 Response, and that examination does not need to be repeated here.

In summary, ComReg is required to ensure that spectrum licence fees are objectively justified, transparent, non-discriminatory, and proportionate. The proposed licence fee for O2 is different to that proposed for Vodafone, even though both operators are to be issued with interim licences that are essentially identical.

Interim Licence Fee Discriminatory and contrary to EU State Aid Rules

Discrimination arises where persons in similar positions are treated differently, so clearly it arises in relation to the proposed interim licence fee. The proposal is contrary to ComReg's non-discrimination obligation. The proposal to charge a different fee to Vodafone and O2 is also contrary to EU State Aid rules. If both operators are essentially being given the identical licence but O2 is to be charged a higher annual fee than Vodafone, then either O2 is is being charged an excessive fee which is disproportionate, or Vodafone is being under charged. If Vodafone is being under-charged, then it is being conferred with a benefit from the State, which is contrary to State-Aid laws.

O2's spectrum usage fees should be reduced to the same level as whatever usage fees are ultimately arrived at for Vodafone. ComReg's proposal to charge a different spectrum usage fee to Vodafone and O2 is contrary to the EU State Aid rules as embodied in Articles 107-109 of the Treaty on the Functioning of the European Union. The State, through ComReg, is foregoing potential revenue (i.e., the amount which it is not charging Vodafone) and this has a distorting effect on competition (e.g. O2 has to pay more for the same asset). The two fees ought to be the same there can be no justification for Vodafone to be charged less than O2 or for O2 to be charged more than Vodafone. ComReg, as an emanation of the State, would be liable in damages to O2 were ComReg to persist in this approach and therefore ComReg is called upon to equalise the situation. There is little doubt that the European Commission or a court would have concerns about the proposed pricing (e.g. by analogy, the Decision of 4 October 1995 by the European Commission in Conditions Imposed on the Second Operator of GSM Radiotelephony Services in Italy OJ 1995 L280/49 and Case C-462/99 Connect Austria Gesellschaft für Telekommunikation GmbH v Telekom-Control-Kommission [2003] ECR 1-5197).

If both operators (i.e., O2 and Vodafone) are essentially being given the identical licence but O2 is to be charged a higher annual fee than Vodafone, then O2 is being charged an excessive fee which is disproportionate. Again, if ComReg, as an emanation of the State were to persist in such an approach then it would be liable in damages. If Vodafone is being under-charged, then it is being conferred with a benefit from the State, which is contrary to State Aid laws or if there is discrimination in charges then there is discriminatory pricing and interference in competition in the marketplace by the State's actions contrary to both EU and Irish law.

Interim Licence Fee is Excessive

ComReg identifies in document 10/71 the principles to be applied to usage fees under the Authorisation Directive as follows:

(i) usage fees may be levied for the use of radio frequencies as an instrument to ensure the optimal use of such resources;
(ii) usage fees may be imposed for the rights of use for radio frequencies which reflect the need to ensure the optimal use of these resources; and
(iii) usage fees should be objectively justified, transparent, non-discriminatory and

proportionate in relation to their intended purpose.

The points identified by ComReg at (i) and (ii) above are the same. In any event, these principles, as is acknowledged by ComReg, are simply not relevant to interim arrangements. They are not relevant for temporary arrangements for existing operators who already have networks in place that will of course be optimally used during the relevant period. O2 and Vodafone will not, for example, be incentivised by the imposition of higher usage fees to make additional use of such resources.

Similarly, as acknowledged by ComReg in relation to the principle raised at point (iii), there is no reason why the imposition of usage fees can, in the current economic climate, affect competition in a positive way.

ComReg however then makes the following arguments in support of increasing usage fees (to which O2 responds in italics):

(i) Vodafone and O2 will have had the full term of their existing GSM 900MHZ licence with which to generate a reasonable return on their capital investment;

There is simply no legitimate legal rationale for setting usage fees on a retrospective basis such as this. Recital 32 of the Authorisation Directive expressly states that payment arrangements should ensure that such fees do not in practice lead to selection on the basis of criteria unrelated to the objective of ensuring optimal use of radio frequencies.

(ii) The Interim Licence Proposal provides Vodafone and O2 with an additional period during which to generate revenues and profits;

This is irrelevant as the additional period will still be subject to payment of usage fees by Vodafone and O2. Again O2 draws ComReg's attention to Recital 32 of the Authorisation Directive.

(iii) The rate of return on this additional period would be considerably higher as initial and ongoing capital investments are more likely to have been recouped;

This is not a legitimate argument as it is not ComReg's objective to financially penalise Vodafone and O2 simply on the basis of rates of return (which are likely in any event to be reinvested for the benefit of consumers).

(iv) It could be argued that the additional period for Vodafone and O2 to obtain a return on investments provides them with an advantage relative to other operators.

In a competitive market such as that which currently exists, it is a surprising proposition for ComReg to make that the sustainability and continuity of O2 and Vodafone in the market would give them a "competitive advantage" relevant to other operators. It is not clear what ComReg's alternative would be.

ComReg states at page 35 of document 10/71 that high spectrum usage fees will incentivise current GSM licence holders to return unused GSM 900MHz spectrum during the proposed interim licence period. It is simply not logical to suggest that operators should be incentivised to move to 1800MHz for 3G use when ComReg is proposing to auction 900MHz and 800MHz so that it will continue to be available for use.

ComReg has proposed to derive the proposed interim licence fee by reference to the original licence fee, increased by the value of CPI for the previous 15 years. O2 does not accept that CPI is a relevant measure for the adjustment in value of radio spectrum licences to operators. CPI is a measure of changes in consumer pricing, and has little or no bearing on the value of an operator licence. It is widely acknowledged that CPI is not appropriate for use in respect of forms of investment, which spectrum is, because it relates to consumer expenditure. In practice, the value of spectrum licences have been in steady decline since 2001, which would not be reflected in the CPI.

Evidence shows there to be no correlation between changes in CPI and changes in pricing within the electronic communications sector. The chart below which is taken from ComReg document 05/77 shows just how divergent these movements were for a significant portion of the current licence term. If any such indexation was applied at all, then it is the index of communications services prices that should have been used instead of CPI.

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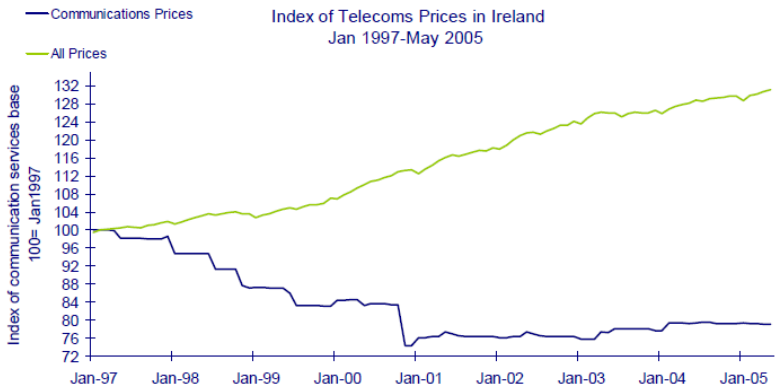


Source: CSO

The DotEcon report determined the market value of a 2x5MHz block of liberalised spectrum. The report indicated that the value should be in the range €18m to €26m. Without prejudice to O2's position that this report overestimates the value of a block of sub-1GHz spectrum in Ireland today (as is set out in more detail below in response to Questions 13/14, it should be noted that on DotEcon's proposal this would give an equivalent annual licence fee of between €1.5m and €2.2m for 2x7.2MHz of spectrum. In proposing to charge O2 an annual fee of €3.1m for the interim licence for unliberalised spectrum therefore, ComReg is proposing to charge O2 in excess of even the upper-end valuation produced by DotEcon. This is contrary to ComReg's obligations and objectives, including in

particular under the Authorisation Regulations to charge licence fees that are proportional to their intended purpose.

Alternative Fee Proposal

O2 recommends that the price for interim licences must be equal for both Vodafone and O2, and should be based on the opportunity cost of the assignment. In this case the opportunity cost is theoretical as there are no other operators who are in a position to use the spectrum in the same way to continue to provide GSM service. In order to remain in compliance with EU State Aid law, ComReg should charge the market value price for the spectrum. The DotEcon report should be revised in the manner discussed in response to questions 13 and 14. ComReg should set the interim licence fee at the median of the resulting lower range recommended by DotEcon.

Q. 8. Do you agree with ComReg's proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

O2 Response 8 & 9

In the earlier consultations ComReg was proposing to hold an auction to assign spectrum in the 900MHz band alone and to impose a cap of 2x10MHz. At that time, O2 supported the imposition of the cap during the auction process, as there were particular restrictions on the supply of lots in that auction. ComReg's stated purpose of the cap is to prevent one or a number of operators (most likely existing operators) from obtaining a disproportionate amount of the available spectrum and thus blocking other bidders. A spectrum cap is a form of intervention by the regulator/auctioneer in the free-market dynamics and is *de facto* contrary to the reasoning behind an auction concept – that the most efficient outcome is determined where the spectrum is assigned to the bidder who places the highest value on it. For this reason, spectrum caps should only be invoked in special circumstances, and only where there is a high probability that the outcome of the assignment process will otherwise inhibit competition or will be directly contrary to ComReg policy objectives.

With ComReg's latest proposal to combine 800MHz and 900MHz in a single award process, the dynamics of the proposed auction have completely changed from its last consultation in this process. There are now 13 lots available for assignment, so concerns regarding spectrum hoarding have been effectively eliminated. There is now sufficient spectrum available for each of the current network operators to obtain 3 lots each, and an additional lot available for a completely new entrant to the market. Spectrum hoarding could only occur where one or more of the existing operators bid for and obtained 4 lots or greater. For this to have the impact of blocking a new entrant entirely, then the hoarding operator would need to value and bid for the incremental 4th lot of spectrum at a higher price than the new entrant would value its 1st block and its market entry. In addition, all other existing operators would also need to place an incremental value on a 3rd block above this price. This is unlikely.

Other cases of partial blocking could occur where a number of existing operators bid for and were assigned 5 or more lots, thus creating a scarcity of supply of lots available for other bidders. Again, this would require that both bidders place a higher incremental value on their 5th lot than other bidders do for their 1st or 2nd lot. Again, this is unlikely. In practice, given the quantity of sub-1GHz spectrum available for assignment, and if ComReg was to proceed with the proposed minimum price, it is a more likely eventuality that spectrum will remain unassigned following the auction process.

If a spectrum cap is to be imposed, then O2 agrees that it should be a simple cap of not less than 2x20MHz below 1GHz. This will provide a reasonable amount of capacity for when the ecosystem will be able to use the 800MHz and 900MHz bands together. Nevertheless, the normal evolution of wireless technology will certainly be able to deal with more bandwidth in the future.

When judged against the degree of consolidation that has occurred during the "GSM" years, it is possible to imagine that the "liberalisation" years will see another type of consolidation leading to more shared infrastructure. It is therefore important not to prevent these initiatives that will in fact ultimately deliver added value to consumers by reducing the operating cost of the network supporting the services. It is important that any spectrum cap required for the auction should not become a barrier to further developments in the structure of the market in the years to come. This is very important in a country like Ireland with just over 4 million inhabitants, as it cannot afford a multiplicity of network infrastructures.

For the above reasons, O2 is of the view that no sub-1GHz spectrum cap is required, and so it should not be imposed. In the event that a cap is imposed during the auction, it should be a simple sub-1GHz cap at not less than 2x20MHz.

There is one further important practical consideration that ComReg must allow for when designing the award process.

ComReg has referred to the inevitability of network sharing on several occasions, and it is now accepted as inevitable that some form of network sharing will emerge in the Irish market. ComReg is obliged in fulfilling its legal obligations to promote efficient investment and innovation in new and enhanced infrastructures, to ensure that any access obligation takes appropriate account of the risk incurred by the investing undertakings and by permitting various cooperative arrangements between investors and parties seeking access to diversify the risk of investment, while ensuring that competition in the market is preserved.

As operators prepare for the roll-out of next-generation access networks and contemplate the scale of investment that will be required it seems inevitable that some form of collaboration including network sharing will emerge in the Irish market. ComReg is aware of this, and has accepted that this is necessary, and can be beneficial for consumers. ComReg should make the spectrum licences as flexible as possible and should facilitate varying degrees of network sharing, including spectrum sharing. This will permit improvements in spectrum efficiency, e.g. a smaller number of lots of shared spectrum may suffice where a larger number of lots would have been required to meet the needs of

operators acting independently. ComReg's licensing regime must facilitate collaboration between operators that may lead to provision of greater capacity and coverage, and increased spectrum efficiency.

It is a practical reality that a number of current network operators in the Irish market (as in any comparable market) will explore network sharing as a means to generate sufficient economies of scale for the roll-out of next-generation mobile networks. Current market realities – declining revenue and exponential growth in capacity demand - mean that this is a logical consideration and consequence. There are many reasons why this is beneficial for operators and consumers, including efficiency gains and consequential expansion of viable service area, environmental, etc. ComReg has indicated its support for network sharing on several occasions.

A logical consideration within network sharing would be spectrum sharing, or at least the aggregation of available spectrum capacity on a shared network. Indeed, ComReg itself has recognised in its *Strategy Statement 2010-2012* that "the market, both in Ireland and globally, has seen, and will continue to see, increased industry consolidation, driven by market convergence and the pooling of resources" (page 16). Equally, in the same document, ComReg has stated that the "aim of regulatory authorities is to facilitate efficient investment…[by] avoiding inefficient duplication of networks" (page 32). This would allow for increased spectrum efficiency, and is something that ComReg should facilitate in licence conditions.

The possibility of network sharing extending to spectrum sharing is another factor for ComReg's licensing process. It could have a very positive impact on spectrum efficiency as a shared network might allow for reduced spectrum use as compared to the requirements to operate two or more separate networks, e.g. take the hypothetical case where two network operators might seek a certain number of lots individually if bidding for independent assignments, but as a result of efficiencies from network sharing could reduce the total demand to a smaller number of lots where they were bidding for combined shared spectrum.

This possibility raises procedural issues for ComReg's proposed auction – operators who would plan to share spectrum could not realise the efficiency gain if the auction rules were structured in such a way as to, even inadvertently, prevent appropriate bidding. For example, the operators of a shared network might wish to combine and enter the auction as a single bidder which would have certain benefits for consumers and efficiency; however this might be ruled out if ComReg set the, the spectrum cap, or the bidder characteristics in a manner which prevented or inhibited this strategy. For example a bidder on behalf of a shared network might have spectrum requirements of greater than ComReg's proposed 2x20MHz cap, which is based on the requirements of single operator networks.

There are only two ways that O2 sees whereby ComReg's auction process can facilitate the delivery of spectrum efficiency through spectrum sharing:

1. having no spectrum cap;
2. allowing pre-qualification of bidders, and then allowing eligible bidders to combine their

individually capped spectrum allowance, e.g. two individual eligible bidders with individual allowances of 4 lots each, could bid as a single entity, with an allowance capped at 8 lots.

ComReg must also ensure that in prescribing bidder characteristics, that they do not prohibit approaches other than single operator bids – for example, joint bidding by a consortium of companies. ComReg must accommodate this possibility within any assignment process, and should specifically address this issue with proposals to be included in the consultation on the auction mechanism.

Q. 10. Do you agree with ComReg's proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

O2 Response 10

ComReg is about to release what could be termed "virgin" spectrum to the market. The 800MHz band will have been cleared, and will be assigned for Electronic Communications Services for the first time. In addition, some of the 900MHz band that has been unused for several years is to be assigned. In general, auctions can be a suitable means to allocate spectrum but by no means are they the only suitable method. Auctions tend to be more appropriate for virgin spectrum as all applicants can approach the process as equals unencumbered by legacy assignments. However for re-assignment of spectrum, legacy issues can mean that other methods like administrative assignment are more appropriate in these cases.

As a general principle, the use of auctions to assign spectrum is only necessary and appropriate where demand exceeds supply, and ComReg needs an objective method to decide who should be assigned spectrum and what quantity. An auction was originally proposed for the 900MHz band on the basis of market information indicating that there was an excess of demand over supply. As previously stated in this document, ComReg's latest proposal completely changes the dynamics of the award process. At the minimum price proposed by ComReg, it is possible that a significant number of lots will remain unsold and it will not be necessary to hold an auction. .

The true demand for spectrum at the minimum price will only be revealed when applicants are required to make binding commitments and forward their deposits. O2 recommends that ComReg brings forward this part of the process so that it occurs in advance of the development of bidding software and other such tools. In the event that there is sufficient spectrum to meet demand then this will save unnecessary time and expense for applicants and ComReg by avoiding the necessity for a main auction stage. It would be clearly contrary to ComReg's functions and objectives to engage in the expense and effort of an auction where one was not required. It is legally incumbent upon ComReg to take what measures are appropriate to establish whether supply will in fact exceed demand, and not rely on speculation as to what may or may not in fact be the future position.

Q. 11. Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view.

O2 Response 11

Subject to the timing modifications proposed in O2's response to Question 5 above, O2 agrees that if ComReg is correct in proceeding with an auction it should use two temporal lots that coincide with the relevant time periods within the 900MHz band.

Q. 12. Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

O2 Response 12

Subject to the reservation of rights as already noted, yes. In the event that ComReg proceeds with an auction, O2 agrees with ComReg's proposal to use an open combinatorial clock auction, subject to certain guarantees regarding the specific auction mechanism. O2 had raised a serious objection to ComReg's previous auction proposal as outlined in the O2 09/99 Response, and welcomes the fact that ComReg has in a number of material respects taken that objection into account.

The primary objective of an auction is to ensure an efficient outcome in the form of a set of assignment decisions. In this case, there are a number of additional requirements, including:

- facilitating continuity of operation of existing services so as to avoid consumer disruption;
- facilitating aggregation, and avoiding fragmentation of assignments;
- minimising common value uncertainty; and,
- avoiding or minimising the possibility of manipulation of the auction result by non-genuine strategic bidding.

ComReg has proposed a combinatorial clock auction with supplementary and assignment stages whilst retaining the second price rule. The auction mechanism proposed appears to address the main objectives outlined above.

In presenting the new approach, ComReg's advisors DotEcon stated that by adopting a specific bidding strategy a bidder could be guaranteed not to be outbid in the supplementary round for lots where it was the highest bidder in the primary round. O2 welcomes this confirmation by DotEcon that the proposed auction mechanism can achieve this outcome, and would seek confirmation from ComReg in this consultation process that this will in fact be the case.

Within the formal documentation setting out the rules and objectives of the auction ComReg should provide a written guarantee of DotEcon's claim, i.e. the formal rules used by ComReg should include a provision which states explicitly that any provisional winner (in the final primary round) is guaranteed to be allocated their provisional package (or perhaps more) if they follow the DotEcon suggested "knock-out" bid strategy. In addition, the auction rules should make it clear that the supplementary bids required to pursue this knock-out strategy should be stated by the auctioneer at the appropriate time.

Alignment of Licence Start Dates

ComReg should encourage Meteor to release at least 2.2MHz of GSM only spectrum in advance of its licence expiry *in* 2015. This will liberalise an additional lot of spectrum to be sold in the auction in the time period from 2013 to 2015. This must be clarified and be transparent to bidders before the auction commences. ComReg has the statutory power to ensure this happens in a legally compliant manner.[2] The initial time period 2013-2015 will be disproportionately important in the auction process. During this period, existing operators will have a requirement to secure enough spectrum to maintain existing GSM networks, but also to introduce mobile broadband service on sub-1GHz spectrum. Spectrum valuations will be significantly more heavily influenced by this time period than by the subsequent licence period. If one operator was permitted to effectively withhold two lots of spectrum from this period in the auction they would be given an unfair advantage over other GSM operators who must bid to obtain spectrum for both GSM and mobile broadband during this period.

Meteor would have an unfair advantage over other existing GSM operators, and it would distort competition, if Meteor was permitted to effectively retain spectrum and choose during the auction whether they wish to play or not depending on the price bid by competitors. It would be fundamentally unfair, contrary to law, and a distortion of competition to allow Meteor a one-way bet - where they knew that they could not lose any spectrum in the first time period, but only gain some if the bidding worked out to their advantage. It would be contrary to ComReg's objectives and functions to allow this to occur.

O2 must fully reserves its rights in relation to the fact that as a result of the licensing regime imposed by ComReg in Ireland, and how that licensing regime is now being managed in the context of the liberalisation process, ComReg is giving Meteor an unfair competitive advantage in the process and in the market.

Q. 13. Do you agree with ComReg's proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

O2 Response 13 & 14

O2 fundamentally disagrees with ComReg's proposal regarding the minimum price. O2's view is that ComReg has incorrectly used DotEcon's benchmark report and has proposed an excessive minimum price. This minimum price will in all likelihood leave spectrum unassigned following the award process, which would be an inefficient outcome, and would be contrary to ComReg's statutory obligations.

[2] Directive 2009/114/EC Recital (6): The directive provides that Member States can amend and/or review rights of use of spectrum and thus have the tools to deal, where required with such possible distortions.

In explaining the approach to setting minimum fees, CmReg has given the following factors that should inform the decision:

- the minimum price should not give rise to or increase incentives for collusive behaviour;
- the minimum price should not be set so high as to choke off demand;
- the minimum price should not be set so low that there is participation by frivolous bidders;
- the minimum price should not reflect any "social option value"; and
- the administrative costs of running the award process should be recovered from the minimum price set.

In the case of each of these criteria, there is either no correlation between its objective and the proposed minimum price, or it will in fact prevent the desired outcome.

Collusive Behaviour

One of the considerations presented by ComReg as explanation for setting a high reserve price is to avoid collusive behaviour among bidders. However ComReg has not presented any evidence to show the link between minimum price and collusive behaviour (i.e. no analysis whatsoever has been presented to show how different minimum prices affect possible collusion). ComReg seems to have assumed that the only option is to set the minimum price at the expected market value. The benchmark report provided by DotEcon does not provide evidence in support of ComReg's position, and is not a study designed to determine the relevant price that should be set in order to prevent collusion within any auction – is is a view of the market value of the spectrum in Ireland. If the report was designed to find the lowest price at which collusion would be minimised, then it would have produced an analysis of the effect of different minimum prices on collusion within auctions. It does not.

The assignment process should be properly designed by ComReg so as to produce an efficient and fair outcome. In the case where ComReg has chosen to use an auction as the method for assignment, then the auction mechanism itself and associated rules should be sufficiently robust to prevent collusive behaviour. While ComReg has not presented the full and final auction rules yet, O2 is not aware of any inherent weakness in the proposed mechanism that would facilitate and encourage collusion. ComReg has not presented any evidence to explain why a spectrum auction in Ireland is more likely to involve collusion between participants than an auction in any other country. It would be incorrect for ComReg to decide on an assignment method, and then set an excessive reserve or minimum price to mitigate weaknesses in the assignment method itself.

The setting of a high reserve price does not in itself alter the auction process or mechanism in a way that rectifies inherent weaknesses. As ComReg states it merely reduces the incentive by eliminating possible gains although this is only below the price of €25m, it does not prevent collusion otherwise, however to set the reserve price artificially high for this purpose is itself a manipulation of the auction outcome.

There are legal mechanisms (e.g. the Competition Act 2002 and Article 101 of the Treaty on the Functioning of the European Union) to deal with any such collusion. Accordingly, if the true motivation underlying ComReg's proposal is the avoidance of collusion, it is unnecessary to artificially raise the minimum price in the manner proposed by ComReg and setting a minimum price in itself does not prevent collusion.

In summary, a presumption of collusive behaviour is an extraordinary starting point as the basis of an auction process amongst Irish mobile operators that are, like any other corporations, subject to the laws of Ireland and the EU and the regulation of ComReg. We note that ComReg may have changed its position from concerns about actual collusion to concerns about "tacit" collusion, but it is still to achieve the same desired result – to support a purported justification for its minimum reserve price. The answer to this purported risk is that the assignment process should be properly designed by ComReg so as to produce an efficient and fair outcome – not that mobile operators in Ireland should be presumed to collude.

Preventing collusive behaviour is the only reason given by ComReg for selecting a minimum price at the upper end of the band proposed by DotEcon. For all of the reasons outlined above, the claim that setting a minimum price prevents collusion simply does not stand up. It is quite extraordinary that ComReg are justifying charging operators €7 million per lot above the minimum recommended by its own advisors simply on the basis that this will allegedly prevent collusion, when it simply has no basis in logic or fact. In particular €25 million offers no greater efficacy than €18 million in preventing collusion, and there is no analysis by ComReg of why this higher figure is claimed to be more effective in preventing collusion. ComReg itself acknowledges on page 47 that a price at the lower end of the DotEcon range would reduce the risk of choking off demand (one of ComReg's own objectives). In then going on to opt for the higher end instead solely on collusion grounds, it gives no evidence of why the collusion objective carries greater weight than the objective of not choking off demand. It does not give any justification for selecting a figure which by its own admission increases the risk of choking off demand. It is particularly surprising that ComReg simply opts for the upper end given DotEcon's own recommendations that a conservative approach be taken and that ComReg err on the side of caution.

O2 also notes the statement that "with less of a concern over collusive behaviour in the auction, it is DotEcon's recommendation that the minimum prices be set more moderately against the estimated benchmark value range". ComReg then however goes on to state that "ComReg remains concerned about the risk of tacit collusion". However, it gives no basis whatever for this concern, and why it appears to diverge from DotEcon's position. The example ComReg gives to highlight the risk of collusion is not in fact an example of illegitimate tacit collusion. ComReg suggests at page 47 of document 10/71 that given the relative positions of the MNOs in terms of market shares and history, a tacitly collusive outcome might emerge in which competition is short circuited by the weakest MNO opting for a smaller licence rather than competing for a larger one. With respect, this appears to be a case of ComReg misunderstanding what constitutes collusive behaviour in the context of an auction. Any operators opting out of, or reducing demand, in the course of an auction process is not, under any analysis, collusive behaviour but rather it is independent legitimate behaviour of one party in a competitive auction.

Choking off Demand

In setting an excessively high minimum price, ComReg is creating a likely outcome where a substantial amount of spectrum will not be allocated following the auction process, despite the fact that there may be demand for the spectrum at a lower minimum price. The result would be a failed auction, and would mean that the un-allocated spectrum would remain unused, possibly for several years, as any move by ComReg to place this spectrum on the market at a lower minimum price would likely be challenged by licensees who had bought their spectrum at the excessive price.

ComReg has incorrectly used the DotEcon report in setting the minimum price. If benchmarks were to be used at all, ComReg should have used a benchmark of reserve prices or minimum prices respectively to set the reserve price and minimum price in Ireland. In its updated report (paragraph 2.1), DotEcon states that its database records information regarding minimum price/reserve price, which begs the question as to why this benchmark was not used? ComReg should ask DotEcon to produce a benchmark of minimum prices for publication with the response to this consultation, in order to ensure a fair and transparent process.

The DotEcon report itself is an estimate of the market value of a lot of spectrum to within a relatively wide range. As discussed below, O2 believes there is a significant margin of error in this report, and that there are important factors that have been incorrectly excluded. It is particularly surprising that ComReg has chosen to use the DotEcon report and to set the minimum price at the upper end of the estimated range. DotEcon itself recommends that the minimum price should be moderately estimated against the benchmark range, and that ComReg should err on the side of caution. For no stated reason other than the prevention of collusion, ComReg has decided to "maintain a minimum price at the upper end of the range estimated by DotEcon". In effect, ComReg is setting the minimum price at what it believes the sale price should be and as a result is inhibiting the auction as a means to determine the price – almost guaranteeing that it will choke off demand.

ComReg does not appear to have taken into account its experience from 2006 when it carried out an auction of spectrum in the 26GHz band. In this auction, a minimum price of €1m per lot was set, however the minimum was excessive, and proved to be a deterrent to potential bidders. In the event there were no participants in the auction, and ComReg was forced to re-run the process again in 2008 with a reserve price of just €70,000. This time there was participation and spectrum was assigned. This experience is clear evidence that minimum prices should be kept reasonably low to avoid deterring bidders from entering the auction. Furthermore, in this auction ComReg do not have the option to go back to the market with 800MHz and 900MHz if its excessive minimum price in the current situation causes the same problem.

Frivolous Bidders, Social Option Value, Administration costs

None of the above remaining criteria listed by ComReg have any bearing on the proposed minimum price. Social Option Value has not been considered. Frivolous bidders can be easily deterred by having an appropriately small but significant minimum price – the objective could be achieved at a price that is an order of magnitude smaller than that proposed by ComReg. Equally, the administrative costs involved in completing the assignment and licensing process will be insignificant in comparison to the currently proposed minimum price.

The "Long-Run Economic Value of the Spectrum"

In consultation document 09/99, ComReg made several references to the objective of ensuring that the "long-run economic value" of the spectrum is realised. The reference has, in O2's view quite correctly, been removed as a concept, but this has had no impact on ComReg's approach to the minimum price. ComReg should now explain in this consultation process what impact the removal of this objective has in fact had on the minimum price. It appears that ComReg has accepted that as a concept it is not a legitimate purpose, but it is still being taken into consideration, only in a less transparent way.

Minimum Price Damaging to Investment

ComReg is obliged to comply and follow directions issued by the Minister for Communications, Marine & Natural Resources. In proposing an excessive minimum price, ComReg has not followed a specific Policy Direction on industry sustainability (Policy Directions of February 2003 under S.13 Communications Regulation Act, 2002). That Policy Direction provides that ComReg 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.

The communications sector in Ireland (including mobile) is currently experiencing a significant downturn with mobile revenue in decline. ComReg's quarterly market report shows that the mobile sector is generally in decline for the past 6 quarters, with revenue falling by almost 9% per annum. Despite this decline, the capacity required by networks continues to grow as consumers demand more and more data. The industry is now entering a new period in its business cycle, where profitability is falling but network operators must prepare for a significant increase in investment in order to deliver next generation mobile access.

The excessive minimum price will take investment out of the industry at a time when it needs that investment to address the explosion of data demand driven by consumer behaviour needs. This can only result in a reduction of investment in core infrastructure.

DotEcon Report has wide Margin of Error and Overestimates Value

The benchmarking report produced by DotEcon is just that – a benchmarking report. Care should always be taken when using a benchmark to set regulatory prices. The margin of error can be significant and it is never possible to recreate the local market situation completely. This is acknowleged by DotEcon itself who state that the benchmark is a "relatively blunt tool". In order to accurately estimate the market value of spectrum in Ireland, the benchmark would need to find similar market conditions where similar spectrum was sold recently. In practice, is unlikely that a significant number of data points can be found that satisfy these criteria and a benchmark will always have a wide margin of error. It is a highly subjective indicator in the current situation.

Given the uncertainty that exists in relation to the actual spectrum value in Ireland, and the high probability that an excessive price will choke off demand to produce an inefficient outcome, it is astonishing that ComReg has proposed to set a minimum price at the top of the range recommended. ComReg has calculated the Net Present Value of this fee using a discounted cash flow, and has chosen the eircom discount rate for this calculation. However each bidder will have a different cost of capital and a different discount rate. In fact, a discount rate of 8.5% would take the minimum price proposed by Comreg outside of (and above) the full range derived by DotEcon.

There are a number of factors that have either been omitted from the DotEcon benchmark report or taken into account incorrectly and serve to inflate the estimated value of a lot of spectrum in Ireland, including:

Use of GDP

The benchmark report uses a comparison of GDP for Ireland against the reference countries, and while GDP is probably a good comparator for most countries, this is not the case for Ireland due to the large distorting effect of non-national trade. GDP in Ireland is currently 23% greater than GNP, and where there is such a divergence, GNP is a more relevant comparator for the value of a spectrum licence. The value of the licence is derived from the right to use the spectrum in Ireland by consumers based in Ireland. The consumption and revenue generated will be determined by the welfare of those consumers, and on the contrary will be minimally influenced by the value of non-national but domestically located production.

Larger Markets Produce Higher Price/MHz/Pop

The DotEcon benchmark produces a direct comparison of the value of a lot of spectrum in Ireland by measuring the price per Mega-Hertz per head population. This comparison ignores a fundamental fact that it is incorrect to draw a comparison between large and small markets. Larger markets produce higher prices/ MHz/pop and DotEcon should have included a correction for the relative size of the Irish market.

Spectrum Values are Falling

> Spectrum prices are in decline and have been for a number of years. There has been a general but definite downward trend in spectrum prices in recent years. DotEcon should have accounted for this fact by either including a coefficient or correction factor or by some other means to give an increased weighting to more recent auctions.

There are many reasons for this fall in spectrum price, including the current mature state of the market, the level of competition, falling profitability, and upcoming investment requirements. When early licences were being issued, in many cases there was only a small number of competitors and the market was growing rapidly. Spectrum prices produced at that time will have little in comparison with those that can be expected in 2011. Contrary to the approach that should have been taken, DotEcon has modified its benchmark report to reduce the impact of more recent auctions, even though they are the most relevant comparators. In particular, correction factors have been included for the recent auctions in the Netherlands and Finland to prevent them from reducing the benchmark. No such correction factor has been included to compensate for other auctions that serve to inflate the benchmark.

Current Local Conditions

There are a number of other significantly influential local factors that DotEcon has used incorrectly, or need to be updated in the benchmarking report, including:

(i) Impact of the current recession – Ireland is currently in one of the deepest recessions of modern times. Government actions over the coming years are set to have a deflationary impact on the economy which will limit future consumer spending and reduce spectrum value.

(ii) The retail market is increasingly competitive, despite having a population of just over 4 million there are currently 4 network operators and 4 MVNOs (two of which have just launched and therefore would not have been taken into account).

(iii) Expected number of bidders - the DotEcon benchmark is heavily influenced by the expected number of bidders in the auction and the assumption is that there will be 5. At the proposed minimum price, O2 is of the view that there might well be no more than 4. DotEcon should re-run the model to determine what influence this would have on the recommended price range.

Margin of Error

O2 believes there is a significant margin of error in the benchmark report, and would ask ComReg to produce a graph or table showing the value predicted by the model vs the actual price achieved in the 12 most recent spectrum auctions.

For the reasons set out above, O2 is of the view that the DotEcon report over estimates the market value of a lot of spectrum in Ireland, and that there is a significant margin of error inherent in the method used. Given the risk that ComReg will choke off demand in the auction, and that the auction

itself should be allowed to determine the prices paid, if it was to be used at all ComReg should have chosen a minimum price at the bottom end of the range - €18m per lot prior to revision.

In conclusion, ComReg's minimum price is risking the possibility of having unallocated spectrum following the auction process. This unallocated spectrum would be priced at an artificial, and unrealistically high minimum price and is likely to remain unallocated or be assigned at a lower price, thus giving the recipient an unfair competitive advantage over operators that were subjected to ComReg's high starting price. As mentioned above, any move by ComReg to place this spectrum on the market at a lower minimum price would likely be legally challenged by licensees who had bought their spectrum at the excessive price. It is incumbent upon ComReg to avoid this situation arising.

ComReg should consider other options, such as fixing a minimum price for the first lots only, to meet its concerns, and should address such a type of arrangement in this consultation.

Finally, O2 agrees with ComReg's general approach to the structure of licence fees (i.e. split between an up-front payment and annual fees.

Q. 15. ***ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market. Do you agree with ComReg's proposed coverage and roll-out obligation? Please provide reasons for your view.***

O2 Response 15

There are many conflicting considerations that impact this aspect of the licence conditions, and on balance O2 believes ComReg's proposal is a reasonable accommodation of these considerations. Ideally, if an auction is to determine the most efficient assignment outcome, then each bidder must be bidding on the same lots. This cannot be the case where the lot is a licence whose conditions will vary depending on who the winning bidder is. ComReg's proposal to allow a longer roll-out time for the winning bidder if they happen to be a new market entrant would have the impact of increasing the relative value of a lot for a new entrant over an existing market player. By the same token, allowing an existing market player to count network already deployed as contributing towards their coverage would increase the relative value of a lot for the existing operator over a new entrant.

In practice though, user terminals are handed over seamlessly between an operator's different radio layers from time to time depending on location, radio propagation conditions, and other service optimisation considerations. This hand-over guarantees the greatest continuity and best user experience, and operators plan and optimise their networks taking into consideration each of the radio layers available to them. It would be sub-optimal and inefficient if ComReg failed to take this into account in the licence, and wrong to ignore it for the purpose of facilitating an auction assignment process.

O2 agrees that ComReg's proposal strikes a balanced practical approach to the considerations.

There are however some aspects of the proposal that will need to be clarified:

(i) the obligation is per operator and not per lot – so it is assumed that an operator holding 2 lots of sub-1GHz spectrum could meet the obligation by providing coverage using either lot or both combined;

(ii) the obligation applies to all sub-1GHz spectrum held by an individual licensee – so it is assumed that if a licensee holds 1 lot of spectrum in the 800MHz band and 1 lot of spectrum in the 900MHz band, the obligation will be no different than that which applies for an operator holding two lots in a single band;

(iii) as licences will be service and technology neutral, it is assumed that there is no technology specific obligation;

(iv) the coverage obligation referring to the percentage of the population should be defined by an outdoor signal level equivalent to what was required for the 3G licence at 2100MHz.

Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided. Do you agree with ComReg's proposed quality of service obligations? Please provide reasons for your view.

O2 Response 16

O2 generally agrees with ComReg's approach to QoS and licence conditions subject to seeing the detailed proposals.

Licence Conditions – Billing

O2 does not propose to address issues regarding billing at this stage of the consultation, as this matter is subject to separate consultation to take place in December 2010. O2 does not wish to pre-empt the process or outcome of that separate consultation. However, it should be noted that the Authorisation Regulations do not permit the inclusion of billing requirements in a radio licence – these requirements should instead be included in the General Authorisation and a consistent obligation should apply to all providers of Electronic Communications Services. This is necessary to ensure a level playing pitch exists for mobile licensees when compared with other providers of electronic communication services, including MVNO operators. ComReg is however fully aware of O2's position with regard to e-billing. ComReg must not proceed with any Decision in relation to ebilling on foot of this consultation until it has proceeded with its separate consultation in accordance with Information Notice ComReg Doc 10/88. In the event of ComReg proceeding without proper consultation O2 fully reserves its rights.

Other Licence Conditions – General

O2 believes that ComReg including licence conditions in mobile licences on issues which relate

generally to the provision of service to customers is a matter for the Authorisation Directive. Given the increased convergence of offers in the market, the imposition of licence conditions on one platform would be contrary to ComReg's statutory objectives not to distort competition in the market. O2 would object strongly to any conditions being placed in future mobile licences which add costs to its operation and which are not imposed on other competitors in the same market.

Other Licence Conditions – Trading and Sharing

ComReg has previously indicated that any licences issued in the 900MHz band will be service and technology neutral. O2 supports this proposal, subject only to the requirement to ensure interference is avoided. There are other equally important attributes that should be applied to the licences to ensure that the assignments are liberalised, including the absence of restrictions on spectrum trading, and on spectrum sharing.

O2 refers ComReg to section 7 of the O2 09/99 Response where these issues have been previously addressed. The comments made in that document are restated here, and ComReg should address these points when proposing the licence terms in the context of this consultation process. It is now extremely unlikely that ComReg will be in a position to issue revised licences prior to the transposition of the revised Authorisation and Framework Regulations. Accordingly, ComReg will be required to provide for spectrum trading when issuing the licences. ComReg is willing to "look ahead" to the availability of 800MHz spectrum and ASO, despite needing statutory confirmation of this happening post auction, so it should not on the other hand refrain from doing so when it comes to impending statutory implementation of spectrum trading.

O2 would draw ComReg's attention to the points made in response to questions 8 and 9, as they are also relevant when considering licence conditions. .

Other Licence Conditions – Term

ComReg will be aware of the difficulties raised by the expiry of the O2 and Vodafone licences in 2011. It is now proposing to issue licences for 17 years, but has not addressed the issue of what terms for licence extension will be available at the end of the 17 years. O2 submits that, as in other jurisdictions such as the UK, it would be more appropriate to grant open-ended licences, with appropriate provision for review after an initial period of 17 years. This avoids the present situation of operators' entire businesses being put at risk as a result of an arbitrary licence deadline.

Indefinite term licences also avoid the existence of a sunset period towards the end of licensees when it is difficult to maintain investment because there is insufficient time remaining to recoup that investment. O2 has provided its views on this matter in all three previous responses, however ComReg does not seem to have taken this into consideration.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.
Do you agree with ComReg's proposed miscellaneous obligations? Please provide reasons for

your view.

O2 Response 17

Yes, O2 agrees with the proposed miscellaneous obligations.

Q. 18: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

O2 Response 18

Yes, subject to O2's revised proposal regarding the duration of interim licenses, O2 agrees with the proposed transitional arrangements. There is a further practical aspect of the transition that will need to be considered in detail by ComReg – managing the transition in areas close to the border with Northern Ireland. Re-tuning of networks will be particularly difficult in this area as the use of spectrum must be coordinated and shared between all operators on both sides of the border in addition to both administrations. This spectrum sharing effectively means that operators only get to use about half of their assigned spectrum meaning there is no spare capacity available. It will not be possible to maintain service and also reduce the number of channels in use for the purpose of retuning. It might be necessary for ComReg to provide additional spectrum in this area on a temporary basis to provide "parking space" while re-tuning is implemented. This would need to be part of a coordinated plan agreed by all of the interested parties. O2 requests that ComReg provide its views on how this issue will be managed in the response to consultation.

Q.19: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view. 800 MHz, 900 MHz & 1800 MHz spectrum release

O2 Response 19

Yes, O2 agrees with ComReg's proposal subject to the terms of the proposed MOU being reasonably acceptable.

Q. 20: Do you agree with ComReg's proposal to issue "preparatory licences" to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

O2 Response 20

O2 fully supports ComReg's proposal to issue "preparatory licences". This will allow operators to begin building networks in advance of the "switch-on" day in January 2013, and ensure that no time is wasted between the assignment process and the commencement of service. This is a practical

proposal by ComReg that will be beneficial to both licensees and consumers. It should mean that there will be no material impact caused by delaying the availability of the spectrum to a common commencement date.

9 UPC

UPC Ireland response to ComReg consultation on 800Mhz, 900Mhz & 1800Mhz spectrum release Document 10/71

Executive Summary

UPC Ireland (UPC) welcomes the opportunity to comment on ComReg's proposals to liberalise the spectrum bands referenced above.

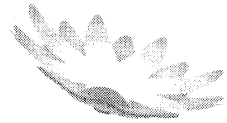
UPC's interest in the current consultation is two-fold:

- the company has a commercial interest in considering spectrum that may be assigned for new market entrants
- as the current licensee of the 2.6Ghz band (which is also under review by ComReg) UPC is keenly interested in ComReg's regulatory approach across all spectrum bands

More generally, UPC notes with interest the reasons set out in Section 2.4 of the consultation document which ComReg believe justify its proposal for a joint award the of the 800 and 900Mhz spectrum bands. UPC would support several assertions made by ComReg in Section 2.4, a number of which echo statements made by UPC in its recent submission to the separate consultation on the 2.6Ghz spectrum band.

In particular, UPC would agree:

- the distance propagation characteristics of both the 800 MHz and 900 MHz bands are ideal for covering sparsely populated areas and UPC would assert, much better suited to offering rural broadband services than at 2.6Ghz
- the costs involved in rolling out broadband services in either the 800 MHz or 900Mhz spectrum band are significantly lower than at higher bands such as 2100 MHz (and UPC would argue, than at 2.6Ghz)
- there is evidence from other countries that operators are already rolling out LTE in the 800, 900 and 1800Mhz bands. UPC would assert that with significant spectrum being granted in the high propagation bands of sub 1Ghz spectrum and the higher capacity 1800Mhz (and 2100Mhz) band there is more than enough spectrum being made available to meet both urban and rural needs between now and 2019, (the termination date of UPC's MMDS licenses if renewed for a further five years). We therefore believe that ComReg should maximise the use of idle spectrum in the valuable 800, 900 and 1800Mhz bands prior to considering any disruption to existing and valued services in the 2.6 Ghz band. In this regard UPC welcomes ComReg's confirmation that (and as UPC would assert, given the unique nature of services offered in this band) the review of the 2.6Ghz band will continue to be a separate process to the 800, 900, 1800 and 2100Mhz liberalisation plans.



On an additional point, UPC notes ComReg's assertion that a joint award would be in line with the regulatory principle of promoting infrastructure competition. UPC understands the 2.6Ghz review is a separate review process however UPC is hopeful that the same regulatory principles that have been applied to the 800, 900 and 1800Mhz spectrum bands with respect to infrastructure competition will also feature in ComReg's final determination on 2.6Ghz in particular as any cessation of MMDS will result in a de facto pay TV monopoly (BSkyB) operating in 50% of the country.

UPC would also acknowledge the current proposal for a joint award in the 800 and 900Mhz spectrum band is in accordance with ComReg's own regulatory functions to promote competition and greater consumer choice. Increasing competition and consumer choice requires new entrants. The key for new entrants to have a chance of obtaining such desirable spectrum in an auction is for frequency blocks to be allocated for new entrant bidding only. Additionally, sufficiently sized contiguous blocks (e.g.- 2 x 20 MHz in the 800 MHz band) must be provided in the new entrant only bands if the Ministerial Policy Directions of attaining true broadband wireless speeds on a national basis is to be accomplished.

On a final note and with specific regard to proposed liberalisation plans for the 800Mhz band, UPC would strongly support the EU's Radio Spectrum Policy Programme's policy objectives (COM(2010)471 final) which call for the need to ensure that any new services in this band "avoid harmful interference or disturbance" to services in adjacent bands. UPC would therefore call on ComReg to ensure any and all relevant technical research and impact analysis is undertaken in advance of the roll out of any new services in this particular spectrum band.

UPC Ireland Responses to specific questions in the consultation

Q. 1 ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex mode of operation. Do you agree with ComReg's proposal? Please provide reasons for your view.

UPC agrees that an FDD mode of operation makes the most sense. The primary benefit of FDD operation is the large ecosystem of FDD capable handsets and mobile devices. Additionally, the simplicity and lower costs of handsets operating in the FDD mode only versus a mobile device that must operate in both FDD and TDD mode is beneficial to the operator. Finally, the potential for interference for collocated base stations operating in the TDD and FDD mode could be of concern for an operator building out a TDD network.

Q. 2 ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg's proposal? Please provide reasons for your view.

UPC agrees. Using the BEM recommendations from industry accepted recommendations for limiting interference between adjacent channels makes sense.

Q. 3 Do you agree with ComReg's proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view.

UPC would refer to the number of comments made in the Executive Summary which address the various reasons that have led ComReg to consider the joint award of these two spectrum bands.

In addition, UPC would make the following observations:

Need to assign spectrum for new market entrants
A joint award of the 800 and 900 MHz bands would make sense once a portion of the 800 MHz spectrum is available for new entrants only.

If ComReg is to proceed with its plans to liberalise vast quantities of extremely valuable spectrum in the 800 and 900Mhz spectrum bands it should ensure licence conditions address its key regulatory and public policy objectives. As ComReg is well aware, the promotion of competition and the interests of users (consumers) are core to the agency's primary objectives. In addition it has to be cognisant of and ensure its management of spectrum is in accordance with Ministerial Policy Directions, one of which documents the Government's desire for the widespread availability of national broadband services.

ComReg's current designs on the 800 and 900Mhz bands clearly speak to Ministerial Direction No. 3 with respect to (almost) national broadband roll-out. The assignment of a portion of this spectrum for new entrants would provide for the introduction of additional competition in the marketplace resulting in greater competition for Irish consumers. Should ComReg decide to assign spectrum for new entrants however it will have to ensure sufficient spectrum is made available at an affordable price if the new entrant is to have any success in competing with incumbents that already have an installed (infrastructure and customer) base and who have presumably already received a return on their initial financial outlay.

UPC believes the 800 MHz spectrum would best able meet the needs of new entrants because of the large amount of spectrum available and the beneficial propagation characteristics of the lower frequencies. Having good propagation translates into less sites which is extremely important to the commercial viability of "Greenfield" wireless business cases.

Q. 4 Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

It always makes sense combining as many frequencies as possible in a single auction as it allows the operators to be able to plan for the future on a total spectrum basis. Once again, it makes sense only if some portion of the spectrum being auctioned in the joint auction is allocated for new entrants only. As per earlier submissions on the 2.6Ghz consultation, UPC would re-iterate that the 1800Mhz is a superior alternative for mobile broadband (LTE) to 2.6Ghz and as such it is appropriate to include this in the 800 and 900Mhz auction. The combination of these three spectrum bands should provide ample spectrum for these mobile broadband services up to and beyond the extended license timeline of 2019 for UPC's MMDS services (in the event ComReg was so minded to renew these licences).

Q. 5 Do you agree with ComReg"s Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

UPC has no objections to the Interim Licence Proposal. As an alternative, ComReg may want to consider a scheme that provides bidding credits in the upcoming 800/900 MHz auction to operators that give up their spectrum early so that the spectrum is available at the time the joint auction is convened. This option could be made available to operators who own 900 MHz spectrum and also to operators who own 2.6 GHz spectrum. This option would allow ComReg to meet its goal of having more spectrum available at a single auction and provide incentives for operators to spend the time and money to free up this spectrum. The use of bidding credits have worked well in other spectrum auctions worldwide (e.g. USA auctions). This would allow some degree of trading of spectrum so all operators could make the most efficient use of spectrum available.

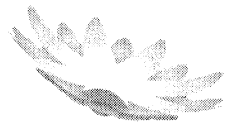
Q. 6 Do you agree with ComReg"s proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

This we believe depends on the level of maturity of the entity to which it is applied. In order to encourage new services and foster new competition the license fees should not apply until a certain threshold of subscribers is reached and definitely there should not be any charges until post the minimum build out period. Thus there should be a scaling of fees which favors new entrants. This is particularly critical to new entrants as the burden of buying spectrum, building a network and marketing services to potential customers is an expensive proposition. Adding fees to the already existing onerous cost structure limits the ability of a new entrant to create a business case that results in a sufficient payback that justifies entering the wireless voice and data marketplace. The critical point is new entrants must have business cases that allow them to be created, differentiate and thrive in a hyper competitive marketplace that is quite saturated.

Finally the current spectrum license fees should be looked at relative to the existing and historic revenue streams and indeed the forecast of these revenues going forward and not be viewed in absolute terms(whether indexed to inflation or not).

While these fees may have been appropriate for a nascent growing mobile voice market with just two operators and high historic ARPUs. Future setting of fees needs to use the relative cost of these fees as a percentage i.e. total spectrum fees generated over the license period divided by total revenues generated for the entire industry and then apply this to each operator taking into account spectrum owned and revenues generated from ownership of same.

This relative rather than absolute approach would be more equitable for all concerned.



Q. 7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg's statutory functions, objectives and duties.

If ComReg feels fees must be added to an operators business case (which ultimately is built into the services charged to customers) then the most equitable approach is to charge fees based on the number of subscribers or mobile revenues a particular operator has in service. Charging a new entrant fees prior to them getting any customers or revenues seems unfair as the new entrant has already paid for the spectrum in the process of acquiring the spectrum in the auction. A double charge for the spectrum (upfront charge plus annual cost) is an exorbitant cost for a new entrant's business case.

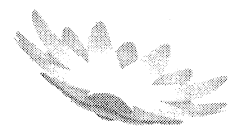
Q. 8. Do you agree with ComReg"s proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

It makes sense to limit the incumbent's mobile operator's spectrum via a cap and in particular a cap on the lower frequencies (e.g. - sub 1 GHz). Alternatively, a simpler alternative proposal that allows ComReg to meet its goal of creating new entrant is possible. For instance, ComReg can allocate a portion of the 800 MHz spectrum for bidding by new entrants only. If a portion of the 800 MHz is made available for new entrant bidding only it makes sense to allocate 2 x 20 MHz (where the 20 MHz is contiguous) for the new entrants. This would allow for new entrants and ultimately their customers to gain the capacity and speed benefits of the larger LTE channel bandwidths. Although the next version of the LTE standard (LTE-advanced) provides for bonding non-contiguous spectrum, commercial products using this feature will not be available for many years and the costs of the CPE will be higher.

Q. 9. Do you agree that a 2 x 20 MHz cap is the most appropriate cap to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

A 2 x 20 MHz cap across 800 and 900 MHz only makes sense if 2 x 20 MHz is set aside in the 800 MHz spectrum for new entrant bidding only. Otherwise, the new entrants could easily be excluded from gaining any spectrum in the joint auction. Assuming four incumbent operators are in Ireland now and each gets 2 x 20 MHz then the total spectrum possible for incumbents is 160 MHz. The total of the 800 and 900 MHz spectrum available (142 MHz = 72 MHz for 800 MHz + 70 MHz for 900 MHz) is less than the total spectrum possible to be obtained from the existing operators. While this wil create competitive tension for the auction a new entrant will not be able to compete with existing operators. By carving out spectrum for new entrants this will actually increase the competitive tension and will possibly allow Comreg to generate the highest benefit for a scarce resource and allow for new innovation by fostering new competition.

Incumbent MNO's always have the ability to outbid new entrants for spectrum as incumbent business cases do not have many of the cost components new entrants have to incorporate in their business plans. Hence, it is highly likely new entrants will be prevented from winning spectrum. There are a number of examples where this already occurred e.g. in the case of



the 700 MHz FDD auctions in the United States, AT&T and Verizon won over 90% of the total FDD spectrum that was on offer.
The propagation characteristics in these spectrum bands are very good (meaning fewer sites are required to be built for coverage). Therefore it makes sense for an incumbent to take steps to ensure a new entrant does not obtain the spectrum which would enable the new entrant to build an economic national network (including in-door coverage) very quickly and compete with the incumbents' existing service(s). Incumbents are thus incentivised to outbid new entrants in the 800 and 900 MHz frequencies as a defensive strategy to keep out a viable potentially disruptive new competitors.

Q. 10. Do you agree with ComReg"s proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes, an auction makes sense but the needs for ComReg to obtain revenues must be tempered with the desire to create a viable competitive environment. The key to creating a viable competitive environment is having new entrants enter the market with sufficient spectrum required to offer higher speed services and a cost structure that doesn't burden their ability to survive in an already very competitive environment.

Q. 11. Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band?

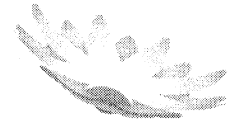
For new entrants the carved out spectrum should be in a single temporal lot for the 800Mhz bands. The dual temporal lot mirroring should only apply to holders of the 900Mhz spectrum.

Q. 12. Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

Yes this is fine once there are two auctions- one for new entrants and one for incumbent operators.

Q. 13. Do you agree with ComReg's proposal to set a common minimum price for the both 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

We believe the 800Mhz band should have a lower minimal pricing as the 900Mhz has immediate ad existing revenues streams while the 800Mhz band will first need o be constructed and will then need attract subscribers. Additionally, there are standardization and technical issues with the delivery of voice over LTE that have yet to be overcome and as this is the majority of revenue in mobile today these bands are not comparable from a return on investment despite their proximity within the sub 1Ghz band. The auction process even within carved out spectrum on these highly desirable frequencies will easily drive the price up so it is best to start the minimal pricing at a lower level. The main concern for high minimum bid levels are bidder collusion and keeping out frivolous bidders can be mitigated by other means than setting the starting price high. For instance, higher down payments



typically restrict non-serious players from entering the auction. Bidder collusion is minimized be creating blocks that a set number of bidders are targeting. For instance, restricting the 4 existing operators to bid on the entire 900 MHz spectrum and a subset of frequencies in the 800 MHz will focus their bidding. If the incumbents know up front they cannot bid for a specific 2 x 20 block in the 800 MHz the bidding because it is for new entrants only defensive bidding (keeping new entrants out), gamesmanship and collusion will be minimized. As mentioned previously, there is little additional value of having new entrants bid against incumbents as new entrants will quickly not be able to keep up with the incumbents bidding levels. Past auctions validate this hypothesis.

Q. 14 Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

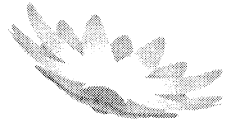
Yes, the reserve prices for 80 for a new entrant are structurally too high. The key is to get new entrants in and incentivise them to innovate and provide coverage. The current structure of the fees appear to be to maximise receipts from an auction which while this may be a goal this should not be at the cost of long term development.

There needs to be different treatment of new entrants and incumbents which an be achieved by signaling this intent early on and clearly carving out spectrum for new entrants. By limiting the spectrum for incumbents this will drive the price of this spectrum upwards so that the amount of money raised in auction remains the same while ensuring new competition is fostered.

Q. 15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market. Do you agree with ComReg's proposed coverage and roll-out obligation? Please provide reasons for your view.

These requirements again should be split and while 70% coverage appears reasonable for a Greenfield build by a new entrant, if the proposed liberalization plans aim to deliver a dividend then the proposal should aim to have high(er) geographic coverage. As discussed earlier there should be a dual licensing structure and the existing incumbents in their licensing should bear
the obligation to meet this coverage.

As it takes new entrants longer to build they should be given more time than that provided and suitable regulated roaming agreements should be applied for the period of the build to allow them to readily compete prior to completion. Using a percentage of population is appropriate for a new entrant but a percentage of land mass metric should be used for existing operators otherwise the digital dividend will enforce rather than resolve the digital divide.



Q. 16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.
Do you agree with ComReg's proposed quality of service obligations? Please provide reasons for your view.

UPC understands ComReg's comments in relation to broadband speeds and quality of service have been made in the context of the current consultation however ComReg will be aware of previous attempts by ComReg and separately the Advertising Standards Authority of Ireland (ASAI) to introduce obligations on operators in relation to actual versus realised speeds. As has been pointed out by the industry in the past, there is no one size that fits all for the measurement of broadband speeds and recordings can vary depending on the topography of the network, the time of day, whether bandwidth is a shared or dedicated resource etc. This becomes even more difficult in mobile broadband where average speeds can be a subset of the peak speeds possible and the variation of indoor versus outdoor speeds are large. UPC would therefore caution against the introduction of any formal regulatory requirements in relation to broadband speeds and would highly recommend that any future considerations by ComReg in this area is an open, transparent and inclusive process with the industry which takes account of these factors.

Q. 17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.
Do you agree with ComReg's proposed miscellaneous obligations? Please provide reasons for your view.

ComReg's proposal relating to miscellaneous obligations for non-ionising radiation, international roaming and Emergency Services appear reasonable.

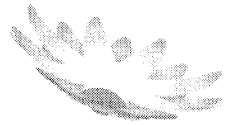
Q. 18: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

Transitional licence approach appears reasonable.

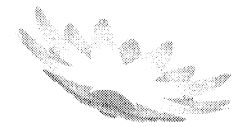
Q.19: Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

N/A

Q. 20: Do you agree with ComReg's proposal to issue "preparatory licences" to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.



Preparatory licence approach appears reasonable.



10 Vodafone Ireland

Vodafone Response to the ComReg Consultation on 800 MHz, 900 MHz and 1800 MHz spectrum release

Ref. ComReg Document 10/71

Response Date: 29 Oct 2010

Introduction

Vodafone welcomes the opportunity to respond to this fourth consultation paper on the future arrangements for the licensing of the 900 MHz spectrum band.

This consultation is taking place at a critical juncture given that the existing 900 MHz licences of Vodafone and O2 are now due to expire in less than 7 months. It is imperative that the outcome of the current consultation provides certainty around continued access to 900 MHz spectrum for the existing 900 MHz licensees.

In Vodafone's response to ComReg's previous consultation paper (ComReg document 09/99) we said that ComReg's then proposals for an auction of all spectrum in the 900 MHz band were inconsistent with the principles of proper administrative decision making and regulatory objectives which ComReg is required to follow. In particular we said that:

a) ComReg's proposals presented a material risk that one or more of the existing licensees might lose spectrum usage rights in the 900 MHz band

.

b) ComReg had made serious errors in its assessment of the costs of disruption and the effectiveness of claimed mitigation strategies in the event of this happening

c) A better approach (described in detail in the response document) was to extend the current 900 MHz spectrum licences of each of the existing licensees in respect of 5 MHz of their current individual 7.2 MHz allocations, whilst auctioning the rest of the 900 MHz band. This would eliminate the risk of costly disruption and loss of competition while offering the same potential for new entry which ComReg sought in its approach.

Vodafone maintains its position in relation to the licensing proposals set out by ComReg in document 09/99. We are pleased that ComReg now presents new proposals that seek to address many of our concerns. Comreg now proposes:

a) The joint award of all spectrum in both the 900 MHz and 800 MHz bands in a single auction process in early to mid 2011.

b) The use of an open combinatorial clock auction (CCA) format with a 'relative cap' activity rule which effectively guarantees that existing licensees would win a minimum amount of 900 MHz spectrum (at least 2 X 5 MHz) in the award process provided that they are prepared to make a sufficiently high bid.

c) The granting of Interim Licences to both Vodafone and 02 in the period from May 2011 until the new 800 MHz and 900 MHz licences (to be awarded under the proposed multi band auction process) are made available no earlier than the beginning of 2013.

d) The formal provision for transitional arrangements, as appropriate, to accommodate issues such as re-tuning and re-location of spectrum assignments that may arise between the conclusion of the auction and the commencement of the new licences awarded in the bands.

Vodafone believes that these features, when taken together, are an appropriate approach that in large measure address the concerns that we have raised in response to the proposals in the previous ComReg consultation papers on the future licensing arrangements for the 900 MHz band. We believe that the detail of the new licensing proposals should be amended in some respects, as described in more detail elsewhere in this response. However it must be noted:

1. Our agreement with ComReg's proposed approach is entirely conditional on all of the key aspects of its proposals remaining unaltered in a final decision on the licensing of spectrum in these bands. Only the implementation of all key elements, taken together, will be sufficient to preclude the possibility of one or more of the existing licensees completely losing access to spectrum in the 900 MHz band with the serious adverse impacts on competition and consumer welfare that would then arise.

2. ComReg's current general proposals address Vodafone's previously stated concerns only when taken as a whole. In the event that any of the fundamental elements of the current proposals are substantially altered or omitted from ComReg's final decision (beyond the amendments recommended by Vodafone in this consultation response) then we would reserve the right to take all available measures available to us to defend our interests and ensure continuity of service to our customers.

Given the extremely limited time now remaining until the expiry of Vodafone's existing 900 MHz licence we urge ComReg to move quickly to implement its proposals, incorporating Vodafone's proposed amendments into the draft and final decision.

It is Vodafone's view that the Interim Licensing arrangements dealing with any transition period and the proposals relating to the spectrum award process can best be treated separately. In order to give the required certainty to existing licensees in respect of current licence expiry, Vodafone suggests that ComReg positions these as separate measures so that any challenge to, or delay in, the spectrum award is decoupled from the Interim Licence arrangements.

Assessment of ComReg Licensing Proposals

Joint Award of Spectrum in the 900 MHz and 800 MHz Bands

Vodafone strongly agrees with ComReg's proposal to jointly release spectrum in the 800 MHz and 900 MHz bands and hold a single award process to simultaneously determine the allocation of spectrum in both bands. We welcome ComReg's decision to take account of the recent announcements of the Minister and the Broadcasting Authority of Ireland (BAI), which have provided clarity on the date of analogue switch off (ASO) and the availability of 800 MHz spectrum for use by electronic communications services, and to address their practical implications in the current licensing proposals.

Vodafone has consistently advocated a holistic approach to the allocation of spectrum in frequency bands that are to significant but varying degrees substitutable for one another and we have clearly stated our belief that this can best be achieved through the simultaneous award of spectrum across multiple bands to the greatest extent possible.[1] The benefits of joint award of spectrum in

[1] *Vodafone response to ComReg document 08/57, p46*

multiple bands, for which uses and therefore valuations are interrelated, are clear. This approach has already, as ComReg has recognised, been adopted in a number of other European countries and Vodafone welcomes ComReg's acceptance of the appropriateness of this approach in Ireland, as evidenced by the licensing proposals in the current consultation.

Vodafone is in general agreement with ComReg's assessment of the key factors and with the analysis that a joint award of the 800 MHz and 900 MHz bands has the potential to increase competition in the mobile market by providing greater scope for facilitating new entrants. We agree that the benefits of joint award of 800 MHz and 900 MHz spectrum outweigh the potential additional complexity of holding an auction for spectrum across multiple bands.

Without prejudice to our previously stated position on the licensing proposals set out in ComReg document 09/99, Vodafone considers that the effect of the joint award of 800 MHz and 900 MHz spectrum on the probability of an adverse auction outcome (complete loss of 900 MHz spectrum by one or more of the existing licensees) can be considered in terms of two separate scenarios:

1. The effect of this proposal independently of the other aspects of ComReg's current proposals.

2. When considered with all of the other key aspects of ComReg's current proposals.

In the first case, the significantly increased amount of spectrum to be made available would somewhat reduce the probability of one or more of the existing 900 MHz licensees losing access to any spectrum usage rights in the 900 MHz band (relative to an award process for the 900 MHz band only). However this effect would be somewhat offset by the (necessarily) larger overall spectrum cap (2 X 20 MHz rather than 2 X 10 MHz) that would apply in a joint award process for 900 MHz and 800 MHz spectrum. It is clear that the joint award of spectrum in the 900 MHz and 800 MHz bands, in and of itself, would <u>not</u> be sufficient to address the concerns raised by Vodafone around the risks and costs of 900 MHz spectrum loss by and <u>would not,</u> in itself, be sufficient to achieve ComReg's statutory regulatory objectives.

However, we do think that the joint award of 900 MHz and 800 MHz spectrum usage rights using a CCA format with a 'relative cap' activity rule as currently proposed, the granting of Interim Licences, and the provision of flexible transition arrangements, would address our concerns. The combination of a joint award of spectrum across the two bands with the use of the auction design currently proposed by ComReg would together preclude the possibility of an existing licensee not being in a position to ensure continued access to at least a single 2 X 5 MHz block in the 900 MHz band over the longer term. The granting of Interim Licences and provision of effective transition arrangements would, if properly implemented, ensure continuity of service to end users in the period between the expiry of existing licensees and the availability of new 900 MHz and 800 MHz licences.

Proposed Approach to Liberalisation of the 900 MHz Band

Vodafone disagrees with ComReg's proposal to delay the making available of 900 MHz spectrum on a liberalised basis until the date when 800 MHz spectrum is available for use. This risks significant unnecessary delay in the refarming of the 900 MHz band for 3G use, and consequent delay in the provision of enhanced mobile broadband services, to the detriment of the welfare of end users.

ComReg has itself recognised that delaying liberalised use of the 900 MHz band as currently proposed could result in productive inefficiency and/or dynamic efficiency to the extent that it delays the provision of new services to consumers. Vodafone's position is set out in further detail below in the section '*Proposed Restriction of Interim Licences to GSM Only Rights of Use'*.

Appropriate Auction Format

Following consideration of the revised proposals for the auction format set out in the current consultation document Vodafone believes that, subject to inclusion as currently proposed in a final ComReg licensing decision, the proposed auction format now ensures that existing licensees will not lose access to the minimum amount of spectrum usage rights they require to maintain existing service provision in the 900 MHz band. We therefore strongly welcome the current proposed auction format and believe that it must be incorporated in ComReg's final licensing decision for the following reasons:

1. In Vodafone's response to ComReg consultation document 09/99 we set out our view that where a competitive award process for the 900 MHz band were to be held, it would be appropriate that the auction format used should allow package bidding as this eliminates bidder aggregation and fragmentation risks and enables the fullest and most efficient utilisation of the spectrum. A general combinatorial auction approach offers these features.

2. Vodafone agrees with the proposal by ComReg to use an open auction format, the combinatorial clock auction, in a joint award process for spectrum in the 900 MHz and 800 MHz spectrum band. We welcome the decision to take explicit account of business continuity risks, and the difficulties of accurate valuation of spectrum for business continuity purposes in the context of a single shot sealed bid combinatorial (SBC) auction format. We maintain our view that significant common value uncertainty favours the choice of a CCA over a SBC auction format, whether for an award process for 900 MHz spectrum only or a joint award process for 900 MHz and 800 MHz spectrum.

3. The proposals to use both a second price rule and a two-stage process (main stage and assignment stage) further increase the prospects for accurate valuation of the spectrum and therefore an efficient auction outcome and must in Vodafone's view be retained in a final decision on the auction format.

4. We agree that any potential for tacit collusion in the context of an award process exclusively for 900 MHz spectrum is further reduced in the context of a multi-band award process for sub-1 GHz spectrum. In any event, detailed auction rules such as the anonymisation of bidder identities and a requirement that bids can only be raised in fixed increments would effectively minimise any scope for strategic or collusive behaviour that may exist. There are no grounds for seeking to set a high minimum reserve price on the grounds of minimising the incentives for collusion.

We believe that the use of a CCA format as proposed when combined with the relative cap activity rule described by DotEcon (which ensures the ability of an existing 900 MHz licensee to rebid in a supplementary bids round to secure at least the minimum amount of spectrum required for continued provision of existing GSM services) must therefore be retained in any final decision if the concerns around risks of service disruption are to be effectively addressed.

Interim Licence Proposal

Subject to ComReg's other key licensing proposals being implemented, Vodafone strongly agrees with ComReg's proposal to maintain 900 MHz spectrum rights of use for both Vodafone and O2 in the period between May 2011 and the date of availability of new 800 MHz and 900 MHz licences. Given the very limited time now remaining to expiry of Vodafone and O2's current licences, the granting of Interim Licences is essential to ensure continuity of existing services to end users, to provide regulatory certainty to the market, and to safeguard the existing strong level of competition.

Vodafone considers that the granting of Interim Licences is fully consistent with ComReg's statutory regulatory objectives. This option avoids the material risk of serious disruption from loss of existing communications services to end users that would otherwise arise. Users of mobile services attach enormous value to their continuous availability and the adverse impact on consumer welfare if disruption were to occur would be very high. A precautionary approach which effectively precludes the possibility of such consumer detriment is imperative in order to maximise benefits for end users.

The granting of Interim Licences is also necessary with respect to the regulatory objective of the promotion and/or safeguarding of competition. As ComReg has recognised, permitting natural expiry of the existing 900 MHz licences of Vodafone and O2 would risk significant distortions to and/or restriction of competition. This is the case not only because the majority of end users of mobile retail services are customers of Vodafone and O2, and existing MVNOs compete on the basis of use of the MNO's networks and current spectrum rights of use in the 900 MHz band, but also because two other operators – Meteor and H3GI - currently rely on national roaming agreements with Vodafone to provide services to many of their customers. Failing to grant Interim Licences to Vodafone and O2 would risk a substantial diminution of competition in the provision of mobile services to end users and could not be reconciled with the objective of promoting competition.

The situation of Vodafone and O2 as existing 900 MHz licensees is not in any way comparable with that of other operators or potential new entrants. New entrants, unlike Vodafone and O2, are not faced with the prospect of the imminent potential loss of all spectrum usage rights for a period of at least 20 months in a band key to the provision of services to their subscribers. Moreover there are no feasible alternative measures, particularly in the very short time now remaining to current licence expiry,that can be taken by the existing 900 MHz licensees to address this issue. The proposal to grant Interim Licences is therefore required to avoid the risk of significant disruption and/or loss of service to end users that would otherwise arise.

Proposed Restriction of Interim Licences to GSM Only Rights of Use

While Vodafone strongly agrees with ComReg's general proposal to grant Interim Licences, we disagree with ComReg's proposal to grant these licences on a GSM only usage basis. This approach can only have the effect of risking significant unnecessary delay in the refarming of the 900 MHz band for 3G use, and consequent deferral of the provision of enhanced mobile broadband services to end users.

ComReg has itself in section 2.4.4 of the consultation recognised that delaying liberalised use of the 900 MHz band could result in productive inefficiency and/or dynamic efficiency to the extent

that it delays the provision of new services to consumers. Dotecon also recognises that even small delays to the availability of services are likely to have large welfare costs.[1]

The proposal not to make the Interim Licences available on a liberalised basis in 2011 is claimed to be justified on the grounds that to do so would distort competition by providing Vodafone and O2 with access to liberalised 900 MHz spectrum earlier than the rest of the market. ComReg has not quantified or identified precisely the nature or magnitude of the competitive distortion which it claims would arise as a result. It cannot simply be the case that an existing operator is then able to use spectrum whilst another is not, since this would prohibit any liberalisation unless and until Comreg could be certain that spectrum were reallocated amongst all operators and all prospective new entrants. Nor can it be required that all operators must be actually able to refarm at precisely the same moment, since it is clearly contemplated that refarming should not depend upon the particular arrangements of individual operators. Instead, Vodafone submits that Comreg is required to consider the implications for competition in the round, having regard for whether other operators can avail themselves of other competitive responses to refarming and that, even if they cannot, any first mover advantage is sufficient to give rise to enduring competitive distortions which cannot otherwise readily be overcome through the subsequent release of additional spectrum or through other remedies.

In this regard we note the view now taken by Ofcom in its recently published advice to the U.K. government setting out its updated assessment of consumer and competition issues relating to the liberalisation of the 900 MHz and 1800 MHz bands. Following a comprehensive analysis of the competitive implications of liberalisation in the U.K, Ofcom states:

> *"Overall **we now consider the risk and extent of any competitive advantage for O2 or Vodafone arising from liberalisation of the 900 MHz spectrum for UMTS to be low and significantly less than our analysis suggested in February 2009.**"*[2]

As a result Ofcom concludes:

"Therefore, given our judgement that there is a reduced risk of a material competitive distortion and concerns over the leading alternative options, **we consider that liberalising 900 MHz spectrum for UMTS in the hands of the current licensees, without imposing conditions (beyond essential technical requirements), is now likely to be the best option.**"[3]

In relation to the requirement to complete a detailed assessment, Comreg has however failed to consider whether the release of 800 MHz spectrum in 2013 would be sufficient to address any concerns about distortion of competition, nor whether other operators might have other means to overcome such distortions (e.g. through the completion of appropriate roaming arrangements).

Comreg also argues that whilst early availability of the 900 MHz band may theoretically provide benefits from liberalisation, there are a number of complicating factors such as the need to

[1] *ComReg Document 10/71a 'Award of liberalised spectrum in the 900 MHz and other bands: a report for ComReg', p27, paragraph 117*
[2] *Ofcom Document 'Advice to Government on the consumer and competition issues relating to liberalisation of 900 MHz and 1800 MHz spectrum for UMTS', paragraph 1.13, http://stakeholders.ofcom.org.uk/consultations/spectrumlib/advice-to-government/*
[3] *Ibid, paragraph 1.14*

undertake transitional measures which may in any event prevent the benefits of liberalisation being realised significantly in advance of 800 MHz spectrum availability.[1] Yet, as explained below, this argument would support a decision to liberalise and thereby meet the requirements of the Amending GSM Directive. If operators cannot in fact refarm the spectrum then no distortion of competition can arise. And if no distortion of competition can arise, then Comreg has no basis for resisting the requirement to remove restrictions on liberalisation at the earliest opportunity.

In short, the burden of proof on this matter rests with Comreg and not with those seeking the removal of the existing restrictions. Comreg has failed to properly understand this and has, as a result, not undertaken the work that it would need to do to justify any delay in removing restrictions.

Duration of Interim Licences

Vodafone agrees with ComReg's proposal to grant Interim licences to Vodafone and O2 which would be in effect from the period between the expiry of current 900 MHz licences in May 2011 and the date of 800 MHz and 900 MHz spectrum availability. We note that a specific end date for the proposed Interim Licences has not been set out, and that termination of the licences is contingent on the circumstances appropriate for the implementation of the new licences (awarded as a result of the auction process envisaged as part of the licensing proposals set out in ComReg's present consultation document) being in place.

Vodafone believes that basing the termination date of the Interim Licences on the realisation of the conditions required for optimal implementation of the new 800 MHz and 900 MHz licences, rather than an arbitrary end date by which time these conditions may not yet have been achieved, is the most appropriate approach. We consider that there would be significant benefit in ComReg defining the minimum conditions that would be required to be met to enable new 800 MHz and 900 MHz licences to enter into force (and consequently trigger the expiry of the Interim Licences) efficiently. Vodafone considers that the proposed conditions below are particularly important and necessary in order to maximise regulatory certainty for market participants. These conditions are:

1. The conclusion of the award process for new 800 MHz and 900 MHz licences.

2. Verification that spectrum in the 800 MHz band has been cleared for use by all the new 800 MHz licences awarded as a result of the auction process currently proposed for 2011.

3. Satisfactory completion of necessary relocation and/or retuning of spectrum usage within the 900 MHz band by existing 900 MHz licensees so as to minimise the effect on the provision of existing communications services to end users and enable holders of new 900 MHz licences to take up their specified spectrum usage rights. (To avoid any potential for undue delay in implementation of these measures to unjustifiably defer the entry into force of new long term 800 MHz and 900 MHz licences, Vodafone considers that this condition would not necessarily have to be met where there was objective reason to believe that one or more of the existing licensees were not making all reasonable efforts to expedite the process.)

4. The conclusion of all and any legal proceedings that may be brought by any party in relation to final decisions by ComReg in relation to the Interim Licences and/or the proposed 900 MHz and 800 MHz spectrum award process.

[1] *ComReg Document 10/71. p21*

5. The provision of sufficient advance notice to existing licensees of a specific expiry date of the Interim Licences. This would occur only after conditions 4 (in the event that legal proceedings were initiated) and 1 have been met in full and after confirmation that sufficient progress toward the achievement of conditions 2 and 3 had been achieved to ensure that they would be completed within the notice period. We consider that a minimum notice period of 3 months would then be required in this context.

Vodafone considers that the fulfilment of all of the above conditions would be necessary before effective availability of new 800 MHz and 900 MHz licences can occur. These conditions are transparent and can also be objectively justified in terms of ComReg's other statutory objectives such as maximising benefits to end users and promoting/safeguarding competition.

Vodafone also notes that the above timelines are to a significant degree under the control of ComReg as the timing of publication of the final Interim Licence Decision will be determined by it, and this will influence the timing of when the proposed minimum conditions will be met. The earlier the implementation of the Interim Licence Decision then the sooner the date of new 800 MHz and 900 MHz licence availability, and provision of advanced broadband services to end users, will occur. In this regard we would urge ComReg to prioritise the activity required to foreshorten these timelines.

In relation to condition 4, it is clear that if legal proceedings are initiated in relation to the proposed Interim Licence Decision, the final decision on the 900 MHz and 800 MHz licensing process, or the outcome of the proposed spectrum award process, then relocation and/or retuning within the 900 MHz band could not be initiated until these proceedings were concluded. Timelines for completion of such steps would have to be extended accordingly, and the date for new 900 MHz and 800 MHz licence availability deferred to take account of any legal appeals were these to arise. It is appropriate and necessary that this, and the other proposed conditions should be explicitly taken account of in ComReg's Interim Licence Decision.

Vodafone notes ComReg's confirmation that licences and all spectrum rights of use granted by ComReg under the Interim Licence would fully and entirely expire one day prior to availability of the new 800 MHz and 900 MHz licences without any right of renewal or extension, and that it is envisaged that Interim Licensees would be required to sign a statement of agreement to this.[1] We consider that a requirement to sign a statement of agreement is unnecessary as any use of the licensed frequencies beyond the stated term of the proposed Interim Licences would clearly be in breach of the law, and would therefore not be contemplated by any licensee.

Notwithstanding our view that a signed statement of agreement as proposed by ComReg is unnecessary Vodafone can confirm that we do not consider that we would have any right of renewal or extension of the Interim Licence beyond the date of availability of new 800 MHz and 900 MHz licences awarded under the proposed spectrum award process. If ComReg maintains that it is necessary to sign a statement of agreement as currently proposed then, subject to reasonable minimum conditions to ensure effective availability of new 800 MHz and 900 MHz licences in line with those set out above being in place, Vodafone has no objection to doing so.

Interim Licence Conditions

[1] *ComReg document 10/71, p27, footnote 57*

With the exception of ComReg's proposal to limit Interim Licences to the use of GSM technology only, Vodafone is not opposed to our existing 900 MHz licence conditions being attached to the Interim Licence proposed to be granted to us. This proposal is not disproportionate as these conditions are already being fully complied with or exceeded and will only apply for the limited additional period of the Interim Licence.

This view is however without prejudice to our position on the licence conditions proposed to be applied to new licences as set out in response to consultation questions 16 and 17.

[Redacted]

Necessity of Earliest Implementation of Interim License Proposal

Given the extremely limited time now remaining to the expiry of Vodafone's existing 900 MHz licence we now urge ComReg to press ahead quickly with the implementation of the Interim Licence proposal set out in the present consultation, but amended to incorporate Vodafone's proposal to allow liberalised use of these licences into the final decision.

In relation to the imperative of early implementation of the Interim Licence element of ComReg's current proposal, we note ComReg's proposal to issue its final decision on these licences at the time of the publication of its proposed draft decision on the licensing of the 900 MHz and 800 MHz bands. Vodafone supports this approach.

Transitional Arrangements

Vodafone agrees that effective transitional arrangements are an indispensable element of ComReg's current proposed licensing approach and must therefore form an integral part of the final 800 MHz and 900 MHz spectrum licensing decision.

A flexible approach to necessary transitional activities (re-tuning and other re-location) within the 900 MHz band will be necessary as it would be impractical, and likely insufficient, to seek to set out in advance the precise steps that would have to be undertaken by licensees in each of the wide range of outcomes that may be realised from a joint award process for the 800 MHz and 900 MHz spectrum bands. Vodafone therefore considers that ComReg's proposal in section 5.2 of the consultation paper to adopt this flexible approach is appropriate.

Vodafone considers that, to the fullest extent possible, it should be left to the operators themselves to co-ordinate to complete required transitional activities although ComReg may have a useful mediating role in many circumstances. Vodafone considers that ComReg must be able to intervene in the event that co-ordination between operators may not take place to the degree required. However in this case a high degree of interaction between licensees and ComReg, including detailed discussions prior to final decisions by ComReg on any disputed matters would maximise the prospects for effecting an efficient transition.

In relation to the timescales and costs of existing 900 MHz licensees undertaking necessary transitional measures estimated in the technical report conducted by Red-M and Vilicom, Vodafone considers that the projected timelines for completion of retuning and/or relocation activities in the case of Scenario 2 in particular (a GSM licensee being assigned 2 X 5 MHz as an outcome of the award process) do not in fact represent a conservative 'worst case' scenario as claimed by ComReg.

A range of simplifying assumptions have been made in order to carry out the modelling exercise in the technical report (ComReg document 10/71c) which have the effect of significantly understating the challenges posed in an orderly transition to use of only a 2 X 5 MHz assignment of spectrum by an existing licensee in the 900 MHz band. Vodafone notes in particular that the simulation exercise carried out to determine the number of additional sites required to transition from use of a 2 X 7.2 MHz spectrum assignment to a 2 X 5 MHz assignment in the 900 MHz band (while maintaining broadly unaffected service provision to end users) is not based on an assessment of the country as a whole but on an extrapolation from two sample areas. Moreover the nominal network plan used assumed an idealised network with base station sites equally distributed over the relevant coverage area without regard to real world constraints, such as those related to obtaining the necessary planning consents from local authorities, that preclude a site deployment approach of this kind from being implemented. As Red-M and Vilicom themselves concede, the model assumption of an equal distribution of sites would obviously not be possible for a real network and the outline methodology is not truly representative.[1]

Vodafone considers that a modelling approach that fully reflected real world constraints, including delays in securing planning permission, would likely conclude that a significantly larger number of additional sites and a longer period of time than the 15-20 months currently regarded as appropriate by ComReg may potentially be required to ensure an orderly transition and the seamless maintenance of communications services to end users under Scenario 2.

Notwithstanding Vodafone's view in relation to the model assumptions, we note that even the findings of the current model simulation used in the technical report conclude that in Scenario 2 only approximately 90% of the required additional sites to effect transition would be built within a 2 year period. However it is claimed that this would be associated with only minor additional disruption to network subscribers, localised to areas where remaining sites had not been completed. Vodafone considers that this analysis understates the probable impact and attaches an inappropriately low weight to the welfare of subscribers whose services may be adversely affected by a transition period of insufficient duration.

Vodafone also disagrees with ComReg's assessment that it is highly unlikely that the worst case scenarios discussed in the technical report would materialise given the technical and non-technical measures claimed to be at the disposal of existing licensees to address any transitional issues.

[Redacted]

With respect to other technical and non-technical measures referred to by ComReg such as the use of alternative spectrum and national roaming, among others, Vodafone has previously explained in the response to ComReg document 09/99 the ineffectiveness of these measures in maintaining unaffected service provision to end users, particularly where limited time is available for implementation. Vodafone maintains its position as set out in that response and considers that the reasoning previously set out is of at least equal validity with respect to transitional arrangements in the context of current proposals.

Vodafone considers that the limitations of the analysis conducted in the technical report means that the risk that an orderly transition under Scenario 2 may not be concluded in the 15-20 month period provisionally concluded by ComReg to be sufficient is significantly understated. Accordingly

[1] *ComReg document 10/71c 'Retuning and Relocating GSM900 Spectrum Assignments in Ireland : Joint Report for ComReg By Red-M and Vilicom', p50*

Vodafone believes that the importance of adoption of a flexible approach by ComReg to facilitate effective transition by existing 900 MHz licensees is further underlined.

Response to Consultation Questions

Q1. ComReg proposes that new services deployed in the 800 MHz band in Ireland employ Frequency Division Duplex Mode of operation. Do you agree with ComReg's proposal? Please provide reasons for your view.

Yes. It is vital that spectrum is made available on a harmonised basis across Europe if the potential benefits from exploiting economies of scale in equipment manufacture and international service interoperability are to be fully realised. As the preferred frequency arrangement of the CEPT and EC Decision 2010/267 is for Frequency Division Duplex (FDD) mode of operation, and as a number of other European countries, including major ones such as Germany, are either planning to allocate or have already allocated 800 MHz spectrum on the basis of a FDD band plan arrangement, this is now very likely to be the common approach adopted by most, if not all, EU member states. Vodafone therefore considers that it is imperative that the FDD band plan arrangement set out in the EC 800 MHz Decision is also adhered to in Ireland.

Q2. ComReg proposes that the block edge masks proposed in the Annex to EC Decision 2010/267 (EC 800 MHz Decision) be applied to licences in the 800 MHz band in Ireland. Do you agree with ComReg's proposal? Please provide reasons for your view.

Yes. Vodafone believes that the BEM set out in the EC 800 MHz Decision is appropriate.

Q3. Do you agree with ComReg's proposal to proceed with a joint award of the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. Please see the section '*Joint Award of Spectrum in the 900 MHz and 800 MHz Bands'* of this response.

Q4. Should the 1800 MHz band be included in a joint auction with the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Although Vodafone agrees in principle that the inclusion of 1800 MHz spectrum in a single award process could somewhat increase the economic efficiency of the outcome in terms of the allocation of spectrum, in current conditions any benefits of this approach are likely to be limited in practice. Moreover in the context of the very limited time now remaining to expiry of the existing 900 MHz licences of Vodafone and O2, these benefits would appear to be considerably outweighed by the risks and costs of delay that may arise from the need to consult upon and finalise the significant

amendments to the current licensing proposals required in order to include 1800 MHz spectrum in a unified spectrum award process.

Vodafone considers that the great majority of the benefits of a single award process for multiple spectrum bands arises in the context of the simultaneous award of spectrum at 800 MHz and 900 MHz. These spectrum bands are the most closely substitutable for one another for the purposes of wide area provision of services such as mobile broadband. Although 1800 MHz spectrum is substitutable to some extent for sub-1 GHz spectrum for wide area service provision, it is generally seen as most suitable to provide additional capacity for delivery of communications services in areas of particularly high demand. In its suitability for the provision of capacity rather than coverage the 1800 MHz band is therefore more complementary to use of spectrum in sub-1 GHz bands and is potentially a closer substitute for the 2.6 GHz band, another higher frequency band that is being made available on a harmonised pan-European basis for mobile service provision.

While usage of spectrum in the sub-1 GHz bands and 1800 MHz band is to a degree interrelated, and there is therefore a valuation linkage, the incremental benefit of its inclusion in a single award process is comparatively limited. It is Vodafone's view that a separate single award process for the simultaneous award of 1800 MHz and 2.6 GHz spectrum at a later stage, which could determine the efficient allocation of these more closely substitutable bands, would be a superior approach with respect to ComReg's statutory regulatory objectives. This is particularly the case when constraints around the timing of availability of spectrum in these bands, and the imminent expiry of existing 900 MHz licences, is taken into account.

Vodafone notes that a review of the use of the 2.6 GHz band is currently ongoing and that proposals in relation to the future arrangements for this spectrum will be the subject of a future ComReg consultation document. A simultaneous award of 2.6 GHz spectrum with 1800 MHz spectrum in a future allocation process should however be formally considered in the development of licensing proposals for the future use of the former band.

As Vodafone has outlined in previous sections of this response, it is now of the utmost importance that ComReg's proposals for the grant of Interim licences are adopted in a final decision as early as possible. This is an absolute necessity if certainty is to be provided to the existing 900 MHz licensees, and their customers, in relation to the continued seamless provision of mobile services beyond the expiry date of current licences. Setting aside the issue of the theoretical benefits of including 1800 MHz spectrum rights of use with 900 MHz and 1800 MHz rights of use in a single award process, the implementation of this approach – as ComReg has acknowledged – would involve significant revisions to many aspects of ComReg's current licensing proposals (including the overall spectrum cap, licence fees, and potentially the auction design and licence conditions). Significant changes of this nature would clearly necessitate a further round of public consultation and Vodafone is concerned that this could further delay the adoption of a final decision on the granting of Interim Licences and/or the other key elements of ComReg's licensing proposals when timely decisions on these issues are required to enable efficient business planning and investment.

In current conditions the disadvantages of further delay in implementation of ComReg's current general licensing proposals in Vodafone's view significantly outweigh any potential incremental benefits from including 1800 MHz spectrum in the proposed unified award process. It may therefore now be more appropriate to consider the simultaneous award of 1800 MHz and 2.6 GHz spectrum in a separate, and later, spectrum allocation process. Concluding a separate allocation process for these higher frequency bands at a later stage (but no later than 2013, with entry into force of the new licences occurring as early as practicable thereafter) would also have the advantage that there will be greater visibility around the future technology and product roadmap at that time.

While Vodafone believes that the optimal approach is to hold an auction approach for the simultaneous award of spectrum in the 900 MHz and 800 MHz bands only in 2011, the interrelationship between these bands and the key 1800 MHz and 2.6 GHz bands in terms of potential future use for the delivery of services does imply a valuation link. Accordingly Vodafone considers that it is essential that ComReg provides the maximum degree of transparency possible in relation to the timing and terms of availability of spectrum in the latter bands prior to the proposed auction of 800 MHz and 900 MHz spectrum. This information is necessary in order to enable prospective bidders to determine as accurately as possible their valuation of the sub-1 GHz spectrum currently proposed to be auctioned.

Vodafone notes that DotEcon, in paragraph 103 of its report, recommends that if 1800 MHz spectrum were not to be included in the proposed auction, ComReg could take steps to reduce uncertainty in regard to this spectrum in terms of providing information on the timing of its availability. We strongly agree with this position and believe that it applies with equal validity to information in relation to the future availability of spectrum in the 2.6 GHz band, to the extent that it is possible to provide this.

Q5. Do you agree with ComReg's Interim Licence Proposal and proposed licence conditions for same? Please provide reasons for your view.

Please see the previous sections of this response in relation to the Interim Licence proposal and associated licence conditions.

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Q6. Do you agree with ComReg's proposal to apply the spectrum usage fees (being spectrum access fee and yearly licence fee) as provided for in their respective current GSM 900 MHz licences of Vodafone and O2, but with both elements indexed to inflation? Please provide reasons for your view.

Vodafone is not opposed in principle to the application of spectrum usage fees (SUFs) to the proposed Interim Licences. However we do not consider that the proposal to index the spectrum access fee and annual spectrum fee elements of the SUF to the overall CPI is necessary to fulfil ComReg's statutory regulatory objectives.

The key criteria for assessing the optimal approach to spectrum fees for Interim Licences are effectively satisfied by the current level of spectrum access and annual usage fees, without a requirement for indexation to the CPI or another price index. ComReg has itself acknowledged that the evidence indicates that existing licensees in the 900 MHz band are currently making efficient use of the spectrum on the basis of the fee levels established under the terms of their current licences. As the current level of fees already achieves the central objective of ensuring efficient spectrum use, the same fee structure and level should continue to fulfil this objective over the short duration of the proposed Interim Licences.

In light of the above Vodafone believes that the optimal approach is to apply to Interim Licences the spectrum usage fees (spectrum access fee and yearly licence fee) as provided for in the respective current GSM 900 MHz licences of Vodafone and O2.

If, notwithstanding Vodafone's view, ComReg nonetheless determines that spectrum usage fees indexed to inflation should apply, then the most accurate measure of inflation with respect to the communications industry must be used. The most appropriate measure is not the cumulative change in the overall CPI since 1996, but rather the change in the communications sub-component of the overall consumer price index. Vodafone notes that this data is readily available from the CSO and has been referenced by ComReg in its most recent Quarterly Report on the Irish communications market. This measure clearly more closely reflects the overall trend in the costs and revenues of the communications industry over the relevant period than the change in the overall CPI and has a stronger empirical justification than indexation relative to the overall CPI.

Q7. Are there any other approaches to determining appropriate spectrum usage fees for interim licences? Please provide reasons for your view, including any other options which you consider may be appropriate having regard to ComReg's statutory functions, objectives and duties.

Vodafone considers that there are a wide range of methods that might be used to determine spectrum usage fees. In the context of the usage fees for an interim license of limited duration, which is in effect an extension of an existing license to avoid consumer harm as part of an overall allocation process, it is Vodafone's view that, provided the points made by Vodafone in relation to Question 6 are addressed, a separate exercise to identify specific alternative methodologies for setting the usage fees for the interim licenses is not required.

Q8. Do you agree with ComReg's proposal to set a sub 1 GHz cap for the competition? Please provide reasons for your view.

In the context of a joint award process for spectrum in the 800 MHz and 900 MHz bands, Vodafone agrees that an overall sub 1 GHz cap would be appropriate to ensure a reasonable distribution of spectrum between operators across these bands while also providing flexibility to licensees in relation to how they combine spectrum across bands to optimise the delivery of communications services to their customers.

Q9. Do you agree that a 2 X 20 MHz cap is the most appropriate to set for a joint award of 800 MHz and 900 MHz spectrum? Please provide reasons for your view.

Vodafone believes that given the proposal to hold an auction process for the simultaneous award of spectrum in both the 800 MHz and 900 MHz bands, which would lead to the near doubling of the supply of spectrum in the licence award process compared to previous proposals by ComReg for an award process exclusively for spectrum in the 900 MHz band, it is now both appropriate and necessary to increase the spectrum cap beyond the 2 X 10 MHz level.

Vodafone agrees that a 2 X 20 MHz spectrum cap is reasonable in the context of the spectrum available as it strikes a balance between avoiding extremely asymmetrical outcomes in spectrum allocations (that could for example potentially lead to one or more existing licensees losing access to sub - 1 GHz spectrum entirely with the enormous adverse impact on competition and consumer

welfare outlined by Vodafone in our submissions to the previous ComReg 900 MHz licensing consultation documents), minimising the risk of spectrum going unallocated from the award process, and also providing any efficient new entrants with the opportunity to obtain access to spectrum.

Q10. Do you agree with ComReg's proposal to hold an auction for the 800 MHz and 900 MHz bands? Please provide reasons for your view.

Yes. Please see the section '*Appropriate Auction Format'* of this response.

Q11. Do you agree with ComReg's proposal to use two temporal lots for the 800 MHz band and that these temporal lots should mirror the time periods of the 900 MHz band? Please provide reasons for your view.

No. Vodafone notes that the rationale for use of a time disaggregated packaging (temporal lots) approach in the proposed auction format for the 900 MHz band set out in ComReg document 09/99 and the DotEcon report 09/99c was to avoid inefficiencies and competitive distortions in the allocation of spectrum that would arise from a time aggregated approach given the later date of expiry of Meteor's 900 MHz licence relative to the other existing licensees. As there are no existing mobile licences with differing termination dates in the 800 MHz band, Vodafone does not believe that there is therefore any justification for replicating the temporal lots approach in the award of 800 MHz spectrum.

As ComReg and DotEcon have acknowledged, the use of a temporal lots approach to the award of spectrum adds significant complexity to the allocation process which, in respect of spectrum in the 800 MHz band does not appear to be offset by any significant incremental benefit. It is difficult to envisage that either existing 900 MHz licensees or a hypothetical new entrant licensee (or licensees) would regard a 800 MHz licence in the proposed first time slice, considered in isolation, as having significant practical or commercial value for the provision of communications services to end users. For existing licensees, the incompatibility of existing GSM equipment with use of the 800 MHz band, and the lack of any equipment (network equipment or end user terminals) to allow this, currently or prospectively, precludes use of 800 MHz spectrum by existing licensees as a substitute for 900 MHz spectrum in the delivery of existing GSM services to retail customers. It is also clear that the use of 800 MHz spectrum by either existing 900 MHz licensees or new entrants for provision of services such as high speed mobile broadband would be efficient and commercially feasible primarily in the context of 800 MHz licences of long duration (at a minimum until 2030).

While use of a combinatorial auction format may effectively address the risk of sub-optimal spectrum allocation outcomes where 800 MHz licence applicants would obtain 800 MHz lots for time slices that would not be consistent with their objectives (for example a 800 MHz licence for a spectrum lot, or lots, only for the first time slice when a licence for the entire period to 2030 was sought) Vodafone considers that the use of a temporal lots approach to the allocation of spectrum in the 800 MHz band is unjustified and unnecessary. Use of a temporal lots approach should be confined to the award of spectrum the 900 MHz band only.

Q12. Do you agree with ComReg's proposal to use an open combinatorial clock auction format for this auction? Please provide reasons for your view.

Yes. Please see the section *'Appropriate Auction Format'* of this response.

Q13. Do you agree with ComReg's proposal to set a common minimum price for both the 800 MHz and 900 MHz bands and to use the updated benchmarking exercise from DotEcon as the basis for setting this minimum price? Please provide reasons for your view.

Vodafone agrees with ComReg's proposal to set a common minimum price for both the 800 MHz and 900 MHz bands. However, as set out in our response to ComReg document 09/99, Vodafone considers that ComReg's proposed approach to the setting of minimum prices is inappropriate and unnecessary as it is based on the incorrect assumption that it is both necessary and proportionate to use the level of the minimum price as a tool to minimise the incentives for strategic behaviour or collusion in an auction. These concerns are already effectively and fully addressed through the auction format and the implementation of other measures in the auction rules.

Implications of Current Licensing Proposals on Rationale for Benchmarking Approach

In the context of a joint award of spectrum in the 900 MHz and 800 MHz bands and a 2 X 20 MHz spectrum cap, there is insufficient basis for adopting a benchmarking approach to address concerns around minimising the incentives for strategic behaviour or collusion in an auction. ComReg itself argues:

> *"Furthermore, the addition of the 800 MHz spectrum band into the process, the scope for introducing a higher spectrum cap of up to 2 X 25 MHz and the possibility of additional bidders partaking in the auction significantly reduce ComReg's previous concerns regarding the risk of tacit collusion, as there no longer appears to be a likely natural outcome as there may have been with the 900 MHz band alone. With the addition of 800 MHz band, there would appear to be a much wider potential range of outcomes that could occur in terms of how each operator could opt for either or both of the available bands."* [1]

The 'natural' outcome referred to by ComReg is described in the context of a basis for an auction outcome to be achieved on the basis of tacit collusion that would be clear to all bidders. [2] It is notable that ComReg concedes, in its reasoning on the appropriate auction format, that not only do elements of the current licensing proposals other than the reserve price significantly reduce ComReg's previous concerns around tacit collusion but also that, in its view, in light of these elements there is no longer any specific spectrum allocation outcome that could form a clear basis for tacitly collusive behaviour by bidders in the auction process.

As joint award of 900 MHz and 800 MHz spectrum, the current proposed auction format, and other proposed rules such as the 2 X 20 MHz sub-cap effectively address concerns around potential

[1] *ComReg document 10/71, p45*

[2] *Ibid "When only the 900 MHz band is made available and the spectrum cap of 2 X 10 MHz is used, a natural outcome would likely be the award of three 2 X 10 MHz licences and one 2 X 5 MHz licence. Given the relative positions of the MNOs in terms of market shares and history, a tacitly collusive outcome might emerge in which competition is short-circuited by the weakest MNO opting for a smaller licence rather than competing for a larger one."*

scope and incentives for tacit collusion or strategic behaviour there is therefore no clear rationale for ComReg's proposal to also seek to set the level of the minimum price, using a benchmarking process, to deal with these issues. So long as the minimum price is set at a level that deters non-serious or speculative bidders, the economic value of the spectrum can be best determined primarily through the auction process.

Proposed Benchmarking Approach

As set out above, it is not necessary to seek to determine a minimum licence price on the basis of a benchmarking methodology as currently proposed. Without prejudice to this position, Vodafone must question the merits of relying on estimated valuation ranges based on outcomes of previous spectrum auctions in establishing a minimum licence price.

Vodafone notes the very limited number of instances of auctions for liberalised 800 MHz and 900 MHz spectrum which have occurred to date. This relatively small number of directly relevant observations must, at a minimum, raise serious doubts about deriving conclusions from the benchmarking analysis about the appropriate common minimum licence price.

If ComReg nonetheless determines that a benchmarking approach remains the most appropriate method for setting a minimum licence price then Vodafone believes that the current approach should be significantly modified if it is to be fully consistent with ComReg's regulatory objectives.

Vodafone considers that use of GNP per capita, rather than GDP per capita, is the most appropriate independent variable to use in the benchmarking analysis in the Irish context as the former is clearly superior to the use of the GDP measure in terms of reflecting the income actually available to Irish residents. The key distinction is that GDP is a geographically based measure of the value of output in contrast to GNP which is a resident based measure.

The valuation that bidders place on spectrum is related to the income level of the residents of the country to whom they would provide services using the spectrum, rather than to the value of the output produced within the country. It is not the case that the GDP and GNP measures necessarily approximate to one another. For example if a large part of the value arising from production of goods and services within a specific country actually accrues to residents of other countries (e.g. profits accruing to multinational companies headquartered in other jurisdictions) then income actually available to the residents in that country will be much lower than the per capita GDP measure indicates. The income level of residents as measured by GNP per capita, with its direct implications for consumption patterns, will be the relevant factor in the context of spectrum valuation, not the value of national output – much of which may be attributable to foreign owners of factors of production located in the country.

While theory clearly favours GNP per capita is the most appropriate independent variable to use in the benchmarking analysis, for most countries there is little difference between the value of GNP and GDP (and their respective per capita measures) and therefore no significant practical impact from using the latter rather than the former. However this is clearly not the case in Ireland where GDP for 2009 of €159.646 billion was almost 22% higher than GNP of €131.241 billion.[1]

DotEcon is aware of the issue of the large difference between GDP and GNP in Ireland but claims that the former has been chosen over the latter as:

[1] *Central Bank Quarterly Bulletin, Q4 2010, p12, Table 1,*

> *"… it is a better reflection of the domestic value of output in a country which in turn is a closer proxy factors that may affect spectrum valuations such as the level of development in a country and the potential willingness to pay for telecommunications services."*[1]

Vodafone does not believe, for the reasons set out above, that DotEcons' argument for its choice of independent variable is valid. While GDP per capita data may be more readily available than GNP per capita information for the countries in the data set, the inclusion of Ireland's GNP per capita in the regression equation gives a much more accurate estimate of the underlying economic value of the spectrum and should therefore be used if the benchmarking approach is adopted by ComReg.

With respect to the time period covered by the national income data used in the benchmarking model, Vodafone welcomes the recognition of the requirement to include updated per capita income data (although this should be based on the GNP per capita measure as already stated) to take account of the structural adverse change in economic and financial conditions that has occurred in Ireland following the credit crisis. However Vodafone believes that the benchmark report must continue to adhere to the principle of using the most up to date national income data available where possible and, as data on GNP per capita for 2010 may well be available prior to the holding of the proposed spectrum award process for the 800 MHz and 900 MHz bands in 2011, 2010 data should if possible be used in the regression equation to obtain a more accurate estimate of the optimal minimum licence price.

Rationale For Pricing Within Estimated Benchmarking Valuation Range

Vodafone considers that ComReg's decision to set a common minimum licence price at the upper end of the range is not objectively justified with respect to the ostensible criterion of minimising the risk of tacit collusion between bidders. Moreover ComReg's decision is inconsistent with the recommendation of DotEcon, as referred to on page 47 of the main consultation document, that as there is less of a concern over collusive behaviour in the context of current licensing proposals, minimum prices should be set more moderately against the estimated benchmark value range.

If a benchmarking approach as proposed by DotEcon is to be used, then Vodafone believes that ComReg's statutory regulatory objectives can be most effectively achieved by setting the minimum prices at the lower end of the estimated valuation range.

Q14. Do you have any comments on the structure of the reserve prices and spectrum usage fees? Please provide reasons for your view.

In Vodafone's response to ComReg document 09/99 we expressed our strong disagreement with the proposed structure of the reserve prices and spectrum usage fees (SUFs) and the comprehensive reasoning for this approach. Vodafone considered, and currently considers, that it is both proportionate and justified that most of the licence price of the spectrum should be captured in the up-front payment. The justification for Vodafone's view was set out comprehensively in our response to consultation question 5 of our response to ComReg document 09/99.

[1] *ComReg document 10/71b 'Award of 800 MHz and 900 MHz spectrum: Update report on benchmarking', p8, footnote 4*

ComReg's proposal in the previous consultation paper (for 50% of the licence price to be required as the up-front reserve price and the remainder to be paid in the form of annual SUFs spread equally over the duration of licence and determined using an appropriate discount rate) remains unchanged in the current consultation document and Vodafone considers that the justification previously set out in support of our alternative approach therefore remains equally, if not more, valid at present.

Q15. ComReg proposes to set a symmetric coverage obligation for 70% of the population of Ireland and an asymmetric roll-out time to meet this coverage obligation. The proposed roll-out time is 3 years for a licensee who has an existing mobile network (i.e. Vodafone, O2, Meteor or 3) and 7 years for a new entrant to the Irish mobile market.

Do you agree with ComReg's proposed coverage and roll-out obligation? Please provide reasons for your view.

Vodafone agrees with ComReg's proposals to set a symmetric population coverage obligation to all licences, to allow multiple frequencies bands to count towards the coverage obligations subject to a minimum 50% coverage obligation being met by the 800/900 MHz bands, and to not allow coverage via national roaming to count towards the coverage and roll-out obligations. These measures should provide the appropriate incentives for efficient and sustainable infrastructure based competition between licensees to the benefit of consumer welfare and the national economy.

We disagree with ComReg's proposal that an asymmetric roll-out obligation should apply to licences, with those licensees with an existing mobile network being required to meet the coverage obligation within 3 years of licence award, while new entrants to the Irish mobile market would be allowed 7 years to reach the same 70% population coverage target. The proposal to allow a new entrant to potentially offer only a very low level of coverage for up to the first 6 years of the licence term does not adhere to ComReg's statutory regulatory obligations to ensure the efficient use of the spectrum and to promote competition.

If, despite Vodafone's view, ComReg nonetheless determines that an asymmetric roll-out obligation for new entrant is appropriate then it would be more consistent with ensuring efficient utilisation of spectrum to require licensees to meet progressively higher roll-out targets by specified dates prior to achieving the proposed final target of 70% population coverage within 7 years of licence award. For example an obligation to roll-out coverage to 30% of the population after 3 years and to 50% of the population after 5 years would be a superior way of specifying an obligation for new entrants, in terms of achieving ComReg's statutory regulatory objectives, than the current proposal.

It remains our position however, as previously stated in response to ComReg document 09/99, that a symmetric roll-out obligation on all licensees to meet the coverage obligation within 3 years of licence award is the most appropriate and proportionate approach.

Q16. ComReg proposes to set a quality of service obligation in relation to the availability of a network, the network voice call (non-VoIP) service and billing and does not propose to set a minimum QoS network standard for a mobile broadband service. Instead ComReg is considering other measures and licence conditions to provide greater information to consumers on the actual broadband speed being provided.

Do you agree with ComReg's proposed quality of service obligations? Please provide reasons for your view.

No. If ComReg considers that there is a potential market failure in respect of QoS (which Vodafone does not believe has been effectively justified) then there are alternative, and more appropriate and effective, means of addressing this than the inclusion of QoS conditions in licences for use of specific frequency bands.

ComReg's proposed licence conditions would lead to QoS conditions being imposed on only some market participants (holders of the particular spectrum licences in which QoS conditions are included) but not on others (those who do not hold licences for the spectrum). Vodafone also notes that MVNOs are not subject to the licence conditions of their hosts and that any licence conditions beyond those that can be directly imposed on a MVNO would be discriminatory.

This issue was previously raised by Vodafone in our response to ComReg document 09/99 but ComReg has provided no objective justification as to why QoS licence obligations that would not necessarily apply to all market participants is the most appropriate way to address the claimed risk of market failure.

In addition a question arises as to the extent of any proposed quality of service licence conditions. It is unclear whether they would apply only to end-user services using the licensed bands or whether they apply to all similar end-user services offered by the licensee with spectrum allocations in multiple bands irrespective of the spectrum over which the service actually is provided. If the latter is intended then it is not clear whether there is a basis for ComReg to impose a condition in one spectrum license which has effect for services carried in separately licensed spectrum. However if the proposed conditions would apply only to end-user services using these licensed bands then clearly there would be a differentiation in obligations pertaining to equivalent end user services provided by an operator based solely on the band in which they might be carried from time to time. ComReg has not provided any objective justification for such a potential differentiation.

Q17. ComReg proposes to set miscellaneous obligations in relation to non-ionising radiation, international roaming capability and access to the emergency services.

Vodafone is not opposed in principle to ComReg's proposed obligations in relation to non-ionising radiation and access to the emergency services. With regard to the proposed obligations in relation to access to the emergency services in particular however we believe that the optimal approach would be for ComReg to consult upon and include objectively justified obligations in relation to access to the emergency services as conditions to the General Authorisation rather than as conditions of specific spectrum licences.

Vodafone considers that including obligations in relation to access to the emergency services as conditions of the General Authorisation only would more effectively meet ComReg's statutory objectives as these would then apply, in a non-discriminatory manner, to all providers of electronic communications services rather than a subset of operators (those holding the proposed new 800 MHz and 900 MHz licences).

We therefore welcome ComReg's recognition that it may be more appropriate to include emergency services obligations as conditions of the General Authorisation and the stated intention to investigate this approach further in future. We also agree with ComReg's proposal to consult with industry on the criteria for the location information to be provided to the emergency services in advance of making directions on the issue.

We must however reiterate our view, as set out in our response to ComReg document 09/99, that a licence condition requiring provision of an international roaming capability is neither proportionate nor justified in the context of the current effective competitive provision of international roaming services by existing mobile operators in Ireland.

Q18. Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 900 MHz band in the period leading up to 800 MHz availability? Please provide reasons for your view.

Please see the section '*Transitional Arrangements'* of this response.

Q19. Do you agree with ComReg's proposed approach in relation to transitional issues that may arise in the 800 MHz and 900 MHz band (between time slices)? Please provide reasons for your view.

Yes. Vodafone agrees that in the situation described by ComReg in section 5.3 of the consultation document, it would not be appropriate to delay availability of spectrum blocks in the second time slice to make allowance for these transition arrangements to be completed.

As the requirement for such transition arrangements would arise solely as a result of a winning bidder's own decisions in an auction process, they should be fully incorporated in a bidder's plans and therefore no allowance should be made (in terms of delayed availability of spectrum blocks in the second time slice) for this.

However, as set out in the response to question 11, Vodafone considers that the use of a temporal lots approach to the allocation of spectrum in the 800 MHz band is unjustified and unnecessary. If Vodafone's view that use of a temporal lots approach only in respect of spectrum usage rights in the 900 MHz band is adopted then the specific situation described by ComReg should not arise.

Q20. Do you agree with ComReg's proposal to issue 'preparatory licences' to winners of liberalised spectrum rights of use in the 800 MHz and 900 MHz bands? Please provide reasons for your view.

It is not clear to Vodafone that the proposal to issue 'preparatory licences' is required to enable recipients to install networks and associated equipment intended for use in the 800 MHz and 900 MHz band while not actually utilising the spectrum for transmissions. However we agree that installation of equipment for use of these spectrum bands must be permitted prior to the commencement date of the proposed new 800 MHz and 900 MHz licences and that preparatory licences should be issued, if this is necessary from a legal perspective, to achieve this. This is essential to ensure the earliest possible provision of advanced mobile broadband services to the benefit of end users.

Vodafone also agrees that ComReg should grant 'test licences' wherever possible under the current test licence framework to facilitate the testing of these networks and equipment.