



Commission for
Communications Regulation

Information Notice

Liberalising the Future use of the 900 MHz and 1800 MHz Spectrum bands & Spectrum Release Options

Publication of the non-confidential input and correspondence with interested parties

Document No:	09/99s
Date:	21 December 2009

1 Introduction

On June 18 2009 the Commission for Communications Regulation (ComReg) published¹ the written responses received to its second consultation on the future use of the 900 MHz and 1800 MHz spectrum bands, document 09/14.

Since publication of document 09/14, a number of related documents have been received from interested parties. In order to further the debate, and in the interest of open and transparent more generally, ComReg is publishing non-confidential documents received and correspondence that has been exchanged with interested parties.

This document contains the following documents listed chronologically.

Description of Document	Author	Dated
Correspondence containing questions concerning consultation document 09/14	Telefonica O2 Ireland	<i>April 15 2009</i>
Reply to Telefonica O2 Ireland correspondence of April 15	ComReg	<i>April 17 2009</i>
Correspondence requesting a meeting between ComReg and industry representatives	Vodafone Ireland	<i>May 19 2009</i>
Acknowledgement of Vodafone Ireland correspondence of May 19	ComReg	<i>May 29 2009</i>
Redacted version of Regulatory Impact Assessment submission	Vodafone Ireland	<i>July 20 2009</i>
Request for correspondence between ComReg and Telefonica O2 as cited on Telefonica O2's response to 09/14	Hutchison 3G Ireland	<i>July 21 2009</i>
Reply to Hutchison 3G Ireland correspondence of July 21	ComReg	<i>July 23 2009</i>
Acknowledgement of Vodafone Ireland correspondence ² of August 25 concerning bilateral meeting ³ with Vodafone Ireland on July 6	ComReg	<i>August 28 2009</i>
Reply to Vodafone Ireland correspondence of 25 August	ComReg	<i>September 2 2009</i>
Further follow up correspondence concerning bilateral meeting ⁴ with Vodafone Ireland on July 6	Vodafone Ireland	<i>September 14 2009</i>
Correspondence concerning stakeholder statements regarding 2.3 GHz equipment availability	Intel Corporation	<i>September 29 2009</i>
Correspondence concerning Vodafone Ireland's proposal published in redacted bilateral minutes	Hutchison 3G Ireland	<i>October 8 2009</i>

¹ See ComReg 09/51s.

² Vodafone letter of August 25 was published in redacted form in ComReg document 09/73

³ The non-confidential minutes of the bilateral meetings held with interested parties are published as ComReg 09/73 on www.comreg.ie

⁴ The non-confidential minutes of the bilateral meetings held with interested parties are published as ComReg 09/73 on www.comreg.ie

09/73		
Reply to Hutchison 3G Ireland correspondence of October 8	ComReg	<i>October 9 2009</i>

Telefonica O2 Ireland - Correspondence containing questions concerning consultation document 09/14 (dated April 15 2009)



15 April 2009

Mr. Samuel Ritchie
Commission for Communication Regulation
Irish Life Centre
Abbey Street
Dublin 1

Dear Samuel,

**Liberalising the use of 900MHz and 1800MHz Spectrum – Consultation
Document 09/14**

I refer to the above consultation document, and note that ComReg has set a deadline of 30th April for response. In addition I refer to Consultation Document 09/15 on the Digital Dividend.

Though they are at different stages in consideration by ComReg, these two consultations will have a direct impact on the availability of spectrum for the provision of mobile communications services in Ireland. There may be inter-dependencies between one consultation and the other as the bands might be substitutable in the future.

In the case of the 900MHz/1800MHz, this is now at the second stage of consultation and ComReg has proposed two main options for consideration. As you will know there are a number of complex matters to be considered, particularly in the 900MHz band where there are existing networks, varying licence expiry dates, and un-assigned spectrum. O2 believes it would have been valuable to hold a workshop or briefing session for clarification between the two formal consultations, either bilaterally or in an open forum. O2 has a number of questions on which we seek clarification from ComReg prior to responding to document 09/14, which I have listed below in the attachment to this letter.

As the response to these questions will influence O2's consideration of the consultation issues, I would request that the responses are given in reasonable time

A Telefonica company

prior to the consultation response date. I would consider that two weeks would be a reasonable time to receive any clarification in advance of the consultation response date. This presents an obvious difficulty with the current response date, and I would now repeat my previous request to have the consultation period extended to May 15th. O2 is of the view that this is the minimum time required to prepare an adequate response. Given the inter-dependency with the consultation on the Digital Dividend, it would make sense to also extend this consultation period to have the same response date, or perhaps slightly later.

Yours sincerely,



Tom Hickey

Questions on Consultation Document 09/14

Under Option 1:

1. Is it proposed that bidders will have the opportunity to bid on a specific block, or will they bid for a lot, the position in the band to be decided later? In the latter case, how would the spectrum lots be allocated?
2. How will ComReg take into account the different expiry dates on current assignments? / how would ComReg deal with any un-used remaining portion of existing GSM licences?
3. Would it be possible for a bidder to win a block which will not become available until 2015?

Under Option 2.

1. If any of the existing licensees were required to return part of their existing spectrum holding as a result of winning spectrum in the 2009 auction, would this spectrum be auctioned by ComReg immediately (e.g. as part of the same auction) or would this be made available in a subsequent auction (2011 or 2015)?
2. Can ComReg give any specific guidance on how it considers it should determine the fees for a licence extension? / how is it envisaged that the licence extension fees be distributed over the duration of the licence?
3. In the event that an existing licensee bids for liberalised spectrum in 2009, how would ComReg deal with any un-used remaining portion of existing GSM licences?
4. Is it proposed that bidders will have the opportunity to bid on a specific block, or will they bid for a lot, the position in the band to be decided later? In the latter case, how would the spectrum lots be allocated?
5. Is it envisaged that the currently un-assigned portion of Block C (2x2.8MHz) would be available at auction in 2009?

**ComReg - Reply to Telefonica O2 Ireland correspondence of
April 15 (dated April 17 2009)**



Commission for
Communications Regulation

17 April 2009

Mr Tom Hickey
Telefonica O2 Ireland Limited
28/29 Sir John Rogerson's Quay
Dublin 2

**Re: Liberalising the use of 900 MHz and 1800 MHz spectrum –
Document 09/14**

Dear Mr Hickey

I refer to your letter received by the Commission for Communications Regulation (ComReg) on 16 April 2009 in which you request an extension of the closing date for submission of responses to ComReg's current GSM Liberalisation consultation (ComReg document 09/14) and Digital Dividend consultation (ComReg document 09/15).

As you would be aware, ComReg's consultation procedures are set out in ComReg document 03/31 entitled "Future Regulation of Electronic Communications Networks and Services". In particular, these procedures provide a typical period of 4 weeks for responses to consultations and also set out a number of matters which may cause this period to be changed. The latter includes:

- the complexity of the issues addressed;
- mobilisation of resources to deal with the issues raised; and
- Interested parties requesting an extension in writing within 5 working days of publication of the relevant consultation.

In setting the original closing date for the current GSM Liberalisation consultation, ComReg had regard to the above matters and therefore allowed a 5½ week period for return of responses. In particular, this extended period took into account the complexity of the issues raised in the further consultation and the strategic and commercial implications for stakeholders, in addition to bank holidays occurring during this period.

Furthermore, in light of requests for extensions to this period received, ComReg extended this period to 5.00 pm, 30 April 2009 (being a total of 7 weeks and 2 working days), further demonstrating ComReg's responsiveness to the representations raised and the matters set out above. In light of the above, ComReg considers its present position to be very reasonable and wholly consistent with the procedures and matters set out in ComReg document 03/31. Accordingly, ComReg has no plans to further extend the

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Commission for
Communications Regulation

closing date for submission of responses to the current GSM Liberalisation consultation at this point.

Concerning your request for an extension to the Digital Dividend consultation, we would note that ComReg again had regard to the above matters and therefore allowed an 8 week period for return of responses. In addition, we note that ComReg's consultation procedures provide that any requests for extension must be received within 5 days of publication of the relevant consultation. In the present case the Digital Dividend consultation was published on 12 March and your request arrived more than one month later. Accordingly, ComReg has no plans to extend the closing date for submission of responses to the current Digital Dividend consultation at this point.

In relation to the eight questions raised in your letter, I set out at the end of this letter our detailed response.

I trust this adequately clarifies matters.

Yours sincerely

Samuel Ritchie
Manager Spectrum Operations
Market Framework

Response to Questions on Consultation Document 09/14

Under Option 1:

1. Is it proposed that bidders will have the opportunity to bid on a specific block, or will they bid for a lot, the position in the band to be decided later? In the latter case, how would the spectrum lots be allocated?

As detailed in section 6.3.1.7 of Consultation Document 09/14, "ComReg will in due course, set out its proposals for the competition format to be used for the assignment of frequencies in the 900 MHz band".

ComReg is currently seeking expert advice on this and related issues.¹

2. How will ComReg take into account the different expiry dates on current assignments? / how would ComReg deal with any un-used remaining portion of existing GSM licences?

Such issues can be covered by the proposed Memorandum of Understanding (MoU) (see section 9.1 (iii) of Consultation Document 09/41). The details of the MOU have yet to be decided. Responses to Consultation Document 09/14 will assist ComReg in this regard.

3. Would it be possible for a bidder to win a block which will not become available until 2015?

As outlined in section 9.1 of Consultation Document 09/14 "*if any of the existing 900 MHz licensees were not successful in the auction for liberalised spectrum, they would be permitted to continue to provide GSM services until the expiry of these licence*". Consequently, under Option 1 this is a possibility.

¹Please see ComReg document 09/22 - Invitation to tender: Spectrum Liberalisation in the 900 MHz and 1800 MHz Bands - Economic Advice

Under Option 2:

1. If any of the existing licensees were required to return part of their existing spectrum holding as a result of winning spectrum in the 2009 auction, would this spectrum be auctioned by ComReg immediately (e.g. as part of the same auction) or would this be made available in a subsequent auction (2011 or 2015)?

ComReg has not come to a view on this issue. Responses to Consultation Document 09/14 will assist ComReg in this regard.

2. Can ComReg give any specific guidance on how it considers it should determine the fees for a licence extension? / how is it envisaged that the licence extension fees be distributed over the duration of the licence?

Expert advice is being sought in relation to the first matter² - section 2.2.5 of the Consultation Document 09/14 refers.

ComReg's current position in relation to the second matter is detailed in section 5.2.3 of Consultation Document 09/14 as follows:

"For any retained 900 MHz licence, ComReg believes that the fee structure should contain both an upfront access fee and an ongoing annual spectrum fee. In setting the upfront access fee, ComReg is minded to base this fee upon the savings that an existing GSM licensee could make by retaining 900 MHz spectrum beyond its licence expiry date. Such savings would include any realignment or migration savings that an MNO may benefit from by retaining such spectrum a longer period of time. In setting the annual spectrum fee, ComReg is minded to base this fee upon the annual opportunity cost to society for the non release of the spectrum into the market on a liberalised basis".

Additionally consultation question 10 of the current consultation invites responses from interested parties in this regard.

²Please see ComReg document 09/22 - Invitation to tender: Spectrum Liberalisation in the 900 MHz and 1800 MHz Bands - Economic Advice.

3. In the event that an existing licensee bids for liberalised spectrum in 2009, how would ComReg deal with any un-used remaining portion of existing GSM licences?

Such issues can be covered by the proposed MoU (section 9.2.2 (ii)). The details of the MOU have yet to be decided. Responses to Consultation Document 09/14 will assist ComReg in this regard.

4. Is it proposed that bidders will have the opportunity to bid on a specific block, or will they bid for a lot, the position in the band to be decided later? In the latter case, how would the spectrum lots be allocated?

ComReg is currently seeking expert advice on this and related issues³.

5. Is it envisaged that the currently un-assigned portion of Block C (2x2.8MHz) would be available at auction in 2009?

As noted in section 6.2.2.2 of Consultation Document 09/14, the weight of responses received supported a minimum block size of 5 MHz. Consequently, ComReg does not envisage any release involving block sizes of less than 5 MHz.

³Please see ComReg document 09/22 - Invitation to tender: Spectrum Liberalisation in the 900 MHz and 1800 MHz Bands - Economic Advice

**Vodafone Ireland - Correspondence requesting a meeting
between ComReg and industry representatives (dated May 19
2009)**



19 May 2009

Mr Alex Chisholm
Commissioner
Commission for Communications Regulation
Irish Life Centre
Lower Abbey Street
Dublin 1,

Re: Request for ComReg Meeting with Mobile Operators to agree future use of the 900 MHz band

Dear Alex,

Vodafone's submissions to the ComReg consultation documents on Liberalising the Future Use of the 900 MHz and 1800 MHz spectrum bands and spectrum release options (ComReg documents 08/57 and 09/14) set out our views on the best approach to the assignment of spectrum in the 900 MHz band. The recommended approach set out by Vodafone in those submissions was necessarily based on ComReg securing agreement across all the mobile operators on the changes to existing arrangements required to maximise benefits to end users and ensure efficient use of the scarce spectrum resource.

It is in this context that Vodafone believes it is incumbent upon ComReg to invite all the existing mobile operators to a meeting as soon as possible to explore an agreed approach to the future allocation of the the crucial 900 MHz spectrum. Vodafone considers that this is the logical next step in the ongoing public consultation process on this issue. A consensus approach to the arrangements for this spectrum band has already been successfully adopted by the Swedish NRA, as previously outlined by Vodafone in the document enclosed with our letter of 14th May. In our view the Swedish decision is a model that would also provide an efficient and equitable solution in Ireland.

I look forward to your response and I would be happy to meet with you to discuss this request further.

Yours Sincerely,

Gerry Fahy

Strategy Director

Cc: Mr. Samuel Ritchie, Spectrum Operations Manager, ComReg

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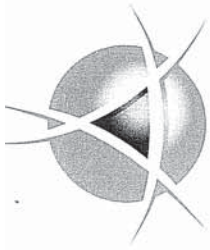
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**ComReg - Reply to Vodafone Ireland correspondence of May 19
(dated May 29 2009)**



29 May 2009

Mr Gerry Fahy
Strategy Director
Vodafone
MountainView
Leopardstown
Dublin 18

Re: Request for ComReg Meeting with Mobile Operators to agree future use of the 900 MHz band

Dear Mr Fahy

On behalf of Commissioner Alex Chisholm, of the Commission for Communications Regulation, I refer to your recent letter in relation to your request as stated above.

We wish to let you know that your request is being considered and we will get back to you in due course.

Yours sincerely

Colette Andrews
Assistant to the Commission

**Vodafone Ireland - Redacted version of Regulatory Impact
Assessment submission (dated July 20 2009)**

Vodafone Regulatory Impact Assessment of ComReg's Proposed 900 MHz Spectrum Licensing Options

Introduction

As ComReg has not carried out any formal regulatory impact assessment of its proposed licensing options for the 900 MHz band as originally set out in ComReg document 08/57, or the new options as set out in the further consultation document 09/14, Vodafone provides here a high level cost-benefit analysis of the relevant licensing options.

Vodafone would emphasise that it is incumbent on ComReg, in proposing licensing options for the 900 MHz band, to conduct the necessary robust and detailed cost-benefit analysis demonstrating that the benefits of its proposals outweigh the costs. Although the present analysis endeavours to provide a reasonably comprehensive assessment of the overall benefits and costs of the available licensing options, it is constrained to a significant extent by the lack of information concerning, for example, the costs that would be incurred by other 900 MHz licensees in the event that they were to partially or completely lose 900 MHz spectrum rights of use as a result of an adverse auction outcome. ComReg is in a superior position to Vodafone in this regard given the ability of the regulator to issue directions to operators seeking relevant information to complete the regulatory impact assessment. In the absence of full information, Vodafone has in conducting this assessment been required to make what we consider to be reasonable assumptions regarding a number of cost impacts of the specified options.

However, the impact assessment carried out here provides robust conclusions regarding the net benefits of ComReg's 2 proposed licensing options and the net benefits of what Vodafone considers to be the most viable alternative option available. Our analysis indicates that there are significant risks that costs with a net present value of between **[Redacted]** (depending on the amount of 900 MHz spectrum that could be lost by an existing licensee in an auction process and the type of remedial action taken) would arise for operators and consumers, under a range of scenarios, if either of ComReg's two proposed options were implemented. It should be noted that this is not a worst case outcome as there is a clear possibility that more than one existing 900 MHz licensees could lose some or all of their current spectrum usage rights in the band, leading to costs for operators and consumers up to twice as large as those set out for a single licensee impact.

In contrast, Vodafone's preferred approach (Licensing Option 3) does not entail any risks of substantial costs and incurs only modest costs of implementation. With regard to the benefits of each of the licensing proposals, it is found that there are no incremental benefits of options 1 and 2 relative to licensing option 3 that would justify the risks of substantial costs associated with the former options. Consequently there is no economic welfare justification for adopting either licensing options 1 or 2. It is concluded that licensing option 3, with the largest net benefit of all the options considered, of **[Redacted]**, is clearly the optimal approach to the future licensing of the 900 MHz band and should be selected by ComReg on foot of this assessment.

Vodafone's impact assessment of ComReg's proposed 900 MHz licensing options is set out in detail in subsequent sections.

Identification Of The Licensing Options

As the three 900 MHz licensing options set out in consultation document 08/57 have now been formally set aside by ComReg in favour of the two new proposed licensing options in the further consultation document 09/14, Vodafone assesses the costs and benefits of these two options (Licensing Options 1 and 2) relative to the benefits and costs of what Vodafone contends is the optimal alternative option available to ComReg, hereafter referred to as Licensing Option 3. Licensing Option 3 is Vodafone's preferred licensing option as set out in detail in our submissions to ComReg documents 08/57 and 09/14. In brief, this licensing option provides for the long term renewal without auction of the 900 MHz spectrum licences held by existing licenses, the expansion of the existing licences from the current 2 X 7.5 MHz assignments to 2 X 10 MHz assignments, and the allocation of the remaining 2 X 5 MHz of the 900 MHz spectrum band by agreement, or by auction or other assignment process as appropriate, to a new entrant to the 900 MHz band.

Another potential option, the 'do nothing' or status quo option considered as a standard default option in many regulatory impact assessments, is not applicable here. Given that existing licences in the 900 MHz spectrum band are due to expire in 2011 and 2015, in the absence of a definitive decision or confirmation by ComReg on licence extension/renewal or other options, it would appear that operators in these circumstances would be required to vacate their current spectrum assignments, leaving this spectrum entirely unutilised. As leaving such important spectrum frequencies unallocated to any use would impose enormous resulting costs and risks of service disruption to existing licensees and their customers, and would be entirely contrary to the imperative of ensuring efficient spectrum use, this 'do nothing option' must clearly be excluded from further consideration.

Identification of Benefit and Cost Impacts of the Options

Introduction

This impact assessment seeks to include within its scope the fullest possible range of benefits and costs arising under the 3 licensing options outlined above. These elements are assessed in terms of their impact on the economy and society as a whole, and not merely in terms of their impact on particular organisations. As analysed further below, while some likely impacts of the licensing proposals represent benefits for particular organisations, they are in many cases merely transfers from one sector of society to another.

It is a central conclusion of this assessment that the key cost impacts of ComReg's two new proposed licensing options would arise in the event that one or more of the existing licensees were to fail to obtain any 900 MHz spectrum, or to obtain less spectrum than their current assignments in this band. While the probability of adverse auction outcomes is difficult to determine in advance, and is to some extent a function of the auction format used (which ComReg has not specified to date), it is certainly significant given the limited spectrum available and the configuration of existing licensee's 900 MHz spectrum rights of use.

Many of the impacts considered in this analysis, are readily quantifiable (the costs of additional base stations, base station upgrades etc.) others, such as the impact on customers of reduced service quality (increased incidence of dropped calls and reduced voice quality) in the event that licensees lose access to 900 MHz spectrum, are less tangible. There would also be major opportunity costs arising from the inability to deploy UMTS in the 900 MHz spectrum by these licensees in this scenario, and the deferral of launch of innovative new products given the need to dedicate finite managerial, financial, and technical resources to addressing the challenge of merely maintaining adequate provision of existing services using reduced spectrum holdings. These costs would not be confined to the affected operator or operators but would also have broad and far-reaching negative effects on both consumers and the overall national economy. Vodafone seeks here to estimate both the more readily quantifiable and more intangible impacts of the various licensing options.

Previous Vodafone Impact Assessment of 900 MHz Spectrum Loss

In our submission to ComReg's initial consultation on proposed future licensing arrangements for the 900 MHz spectrum band (ComReg document 08/57) Vodafone set out a high level impact assessment of the indicative costs that would be incurred by an existing licensee in the event that it had to move to support anticipated future levels of demand for mobile services without 900 MHz spectrum, or with a smaller allocation of this spectrum than current usage rights for 7.2 MHz of spectrum, within 2 years. This assessment was relatively narrow in scope, focusing only on cost impacts on the licensee and its customers, and while describing a wide range of costs it confined itself primarily to an assessment of the most readily quantifiable factors. This previous assessment did not therefore equate to a full cost-benefit assessment of the available options but was intended to establish that the impact of an adverse 900 MHz spectrum auction outcome for one or more of the existing licensees would be substantial, and to inform the comprehensive cost benefit analysis that Vodafone considers as essential for ComReg to carry out prior to any final decision being made on optimal future licensing arrangements for the 900 MHz band.

Benefit Impacts of Licensing Options

Vodafone considers that there would be three main impacts arising from the implementation of the licensing options that could be regarded as being in the category of benefits. These are:

- The welfare effects from an increase in the number of operators in the market
- Revenues that would accrue to the state as the result of the holding of an auction (in the case of ComReg's proposed licensing options)
- The impact of liberalisation in facilitating deployment of non-GSM technologies in the 900 MHz band

The alleged beneficial welfare effect from an increase in the number of mobile operators is essentially the only impact of the 900 MHz licensing proposals that has been explicitly quantified by ComReg in the course of the consultation document to date (as set out in ComReg document 08/57). ComReg's base case estimate of the increase in total economic welfare resulting from an increase in the number of market players (on the basis of ComReg's assumptions) from 4 to 5 is €206m. Vodafone set out a detailed critique of ComReg's welfare analysis that led to this estimate in our submission to the initial consultation document. Among other factors, Vodafone highlighted the inappropriate use of a Cournot model of competition, and inaccurate assumptions regarding future trends in mobile ARPUs in the modelling exercise which lead us to believe that the welfare benefit from such a change in market structure would, at a minimum, be considerably less than that estimated by ComReg.

However Vodafone notes that even if ComReg's estimate of the welfare effect from an additional 900 MHz licensee were accurate it does not constitute a particular benefit arising solely from ComReg's current licensing proposals that establishes the case for using this option rather than the preferred alternative licensing approach suggested by Vodafone. The claimed positive welfare effect resulting from an additional market entrant would also arise as a result of the licensing approach recommended by Vodafone as, even if each of the existing 900 MHz licensees were to obtain a 10 MHz assignment in the band, a 5 MHz block of spectrum would remain available to be taken up by a new entrant licensee as a result of an auction or other award process for this spectrum block. *This estimated benefit of entry by an additional operator of €206 million is therefore included in the assessment of the net benefits/costs of each of the 3 licensing options examined.*

This approach does not take account of the possibility that an existing network operator currently without spectrum usage rights in the 900 MHz band, the mobile operator '3', could be the successful bidder for the spectrum available for a new entrant. In this case the €206 million benefit estimated by ComReg from an entirely new entrant to the mobile market would not arise and the net benefit from each of the proposed licensing proposals would be lower than our net benefit estimates by this amount.

With regard to the revenues that would accrue to the state from the holding of an auction, these would not represent a positive increment to overall economic welfare but rather (setting aside the issue of possible adverse effects on economic incentives for producers and therefore dynamic efficiency) would constitute a transfer of economic surplus to the public sector which would be offset by a decline in the sum of both private consumer surplus and producer surplus. However it is not the case that the overall effect of this transfer would be neutral with respect to overall surplus. Indeed as the transfer of resources would be from one of the most efficient areas of the private sector (the electronic communications sector being among the most effective areas in which to deploy funds in terms of its beneficial impact on economy wide productivity) to the public sector (which is generally recognised to be a less efficient sector in which to employ funds) there would be a high opportunity cost from this transfer that would likely leave society significantly worse off overall. As this effect, while significant, is particularly difficult to quantify, it is conservatively assumed for the purposes of the current assessment that a cost from less efficient deployment of resources transferred does not arise. *As this impact of ComReg's licensing proposals would represent primarily a redistribution of economic surplus rather than an incremental gain for overall economic welfare, Vodafone contends that it is not a relevant factor to be included in the assessment of the net benefits/costs of each of the 3 licensing options examined.*

The final, and most significant, of the benefits of the licensing options arises from the fact that they would liberalise the use of 900 MHz spectrum, thereby allowing the deployment of advanced wireless broadband services, using technologies such as UMTS, on a much more widespread basis (in terms of population and geographic areas covered) than is currently economically feasible. This benefit is of major national economic and social significance as it will contribute to addressing the Digital Divide, with associated benefits in terms of enhanced social inclusion, and improved economy wide productivity, among other positive impacts. The net present value of the benefits of liberalising spectrum rights of use in the 900 MHz band are considerable but difficult to establish with a high degree of accuracy in the absence of a detailed modelling exercise. As to Vodafone's knowledge no comprehensive quantification of the benefits of 900 MHz liberalisation has been undertaken on an Ireland specific basis to date, a quantitative estimate of these benefits is here conservatively derived from studies of facilitating mobile use of the Digital Dividend spectrum. While information from a specific assessment of the benefits of 900 MHz spectrum liberalisation would be preferable, the fact that a key benefit from mobile use of the Digital Dividend spectrum is, like the liberalisation of the 900 MHz band, anticipated to be the deployment of advanced wireless broadband services using that spectrum, it is clear that there are some important similarities between both frequency bands that can assist estimation of the benefits of liberalisation.

Vodafone notes that the Spectrum Value Partners report "Getting the most out of the digital dividend – allocating UHF spectrum to maximise the benefits to society" found that allocation of some digital dividend spectrum to mobile would generate additional value of between €63bn and €165bn NPV over 20 years (the results differed from country to country, and between demand scenarios). The study did not specifically consider Ireland in detail. However, a simple calculation based on the Irish GNP/mobile multiplier (given in the SVP report) would give an estimate of the incremental value of between €1 billion and €3billion from allocating Digital Dividend spectrum to mobile use, again depending on demand scenarios.

As the propagation characteristics of 900 MHz spectrum are less favourable than the Digital Dividend spectrum, the benefits of 900 MHz liberalisation could be expected to be somewhat less than facilitating mobile use of the Digital Dividend spectrum for similar purposes (the provision of innovative new products such as advanced wireless broadband services). Vodafone considers that a very conservative assumption of the net present value of the benefits to overall economic welfare of 900 MHz spectrum liberalisation, with reference to the results of the Spectrum Value Partners study, would be **[Redacted]**. This positive welfare effect of liberalisation of use of the 900 MHz spectrum would arise as a result of all of the licensing options considered, both those set out by ComReg, and Vodafone's proposed option, as all make provision for the liberalisation of use of spectrum in the 900 MHz band. Vodafone notes that ComReg's proposed Option 2, involving a restriction on the liberalisation of any spectrum that would be retained by existing licensees under a limited extension of their existing spectrum usage rights, would lead to lower benefits from liberalisation than the other licensing options. However this element is reflected in the costs to an existing licensee of an adverse 900 MHz auction outcome set out in the section on costs and to avoid double counting it is not explicitly considered here. *The conservative estimate of the overall benefit of liberalisation of use of the 900 MHz band of **[Redacted]** is therefore included in the assessment of the net benefits/costs of each of the 3 licensing options examined.*

Vodafone would note that an additional relevant benefit from ComReg's proposed 900 MHz licensing options would arise if there were reasonable grounds for believing that new entrant operators that could obtain the spectrum usage rights of existing

900 MHz licensees as a result of an auction process would be more efficient than those existing operators. However ComReg has provided no evidence demonstrating that this is likely to be the case, or even referred to this possibility. The robust competition and dramatic price reductions in mobile services observed in this market over a number of years are not consistent with such a situation and Vodafone would contend that this possible benefit is not therefore applicable.

As none of the licensing options considered (both the 2 new options currently proposed by ComReg, and Vodafone's preferred licensing option as previously outlined) provides unique benefits to economic welfare relative to the alternatives, the benefits are not determinative of which of the 3 licensing options is optimal. The assessment of which of the available licensing options is best therefore relies on the analysis of the costs that would arise (or have a significant probability of occurring) under each option.

Cost Impacts of Licensing Options

Vodafone has carried out a high level assessment of the likely costs to an existing licensee and its customers that would arise in the event that it was to lose all or part of its 900 MHz spectrum usage rights from mid 2011 resulting from failure to bid successfully in a competitive spectrum award process as proposed by ComReg. Vodafone considered 2 spectrum loss scenarios:

Scenario 1: Reduction of 900 MHz spectrum allocation from 7.2 MHz to 5 MHz from 2011

Scenario 2: Loss of Entire 900 MHz spectrum allocation from 2011

Scenarios 1 or 2 could arise under ComReg's proposed licensing option 1 (Single Auction Approach) whereas for the purposes of this analysis it is assumed that only Scenario 1 could occur in the case of licensing option 2 (Multi-Phased Approach) on the basis that existing licensees would be granted an extension on at least 5 MHz of their existing 900 MHz assignment until 2015.

An alternative scenario, where an existing licensee was successful in bidding only for spectrum blocks which would not be available to use until mid 2015 is regarded as equivalent to scenario 2 in terms of its cost and disruption impact. This is reasonable as an existing licensee may not have access to 900 MHz spectrum in these blocks for a period of 4 years from the expiry of its existing licence and would be presented with the same options in terms of remedial actions as under scenarios 1 and 2.

Vodafone also considered the most plausible options available to an existing licensee to attempt to maintain existing service, and mitigate the impact on customers, under the two spectrum loss scenarios outlined. Two options based on the implementation, from a theoretical standpoint, of equivalent capacity and coverage as currently provided by the existing 900 MHz network and spectrum allocation using either 1800 MHz spectrum or 2100 MHz spectrum within the available 2 year timeframe were considered:

Implementation Option 1: Re-engineer network to obtain required capacity through reliance on 1800 MHz spectrum

Implementation Option 2: Re-engineer network to obtain required capacity and coverage through reliance on 2100 MHz spectrum

Vodafone considers that Implementation Option 1 would be preferable to Implementation Option 2 given the relatively lower costs of building out network capacity at 1800 MHz rather than 2100 MHz. However given the current uncertainty around continued access to 1800 MHz spectrum after initial expiry of current licences from the end of 2014, the cost impact of the alternative option of building out the required network capacity and coverage to support forecast network traffic levels in the year 2011 using 2100 MHz spectrum have also been assessed.

[Redacted]

Although spectrum optimisation techniques have already been extensively deployed in mobile networks, the options assume that further deployment of spectrum optimisation techniques would be used to increase effective capacity on the network of an affected existing licensee to the fullest extent possible, consistent with maintaining acceptable quality of service for end users.

The costs quantified by Vodafone in its assessment include the costs of spectrum optimisation techniques that could be deployed, the costs of upgrading existing base station sites (network component costs etc.), the costs of acquisition and construction of additional new base station sites that would be required (costs of negotiating planning permission, network component costs), network frequency re-tuning costs, increased opex costs (rent and energy costs associated with the increased number of base stations), costs of decommissioning and removing 900 MHz equipment (applicable under Scenario 2), and **[Redacted]**.

The substantial size of these costs arises from the fact that neither the 1800 MHz nor the 2.1 GHz spectrum assignments of existing licensees are capable of being readily substituted for their 900 MHz spectrum assignment in the key role the latter plays in the provision of communications services to subscribers. The current use of 1800 MHz spectrum by mobile operators in their networks, for example, is primarily to reinforce capacity in areas of high traffic demand and it is not possible to transition the network to using this spectrum in place of lost 900 MHz spectrum for purposes of providing wide area coverage either quickly or without prohibitive cost.

A number of other less readily quantifiable but nonetheless substantial costs such as the negative impact on quality of service to end users (increased congestion and dropped call rates) and the opportunity cost of being unable to deploy UMTS technology in the 900 MHz band with a reduced allocation, or no holding of 900 MHz spectrum, are also assessed and estimated in the analysis. These are vital impacts that must be considered in a comprehensive cost benefit analysis.

For the purposes of the analysis Vodafone has made the entirely unrealistic assumption that the totality of these costs would be incurred fully over the 2 year period between the conclusion of the proposed 900 MHz spectrum auction in mid-

2009 and the expiration of existing 900 MHz licences (those of Vodafone and O2) in mid-2011. In reality the acquisition of the necessary additional new base station sites, for example, would take substantially longer than 2 years, if the necessary sites could be obtained at all (due to planning difficulties etc.), while limited labour and technical resources would constrain the rate of new site upgrades and other activities required so as to make the 2 year timeframe for execution of the options completely unviable. ***The cost estimates provided are essentially theoretical given that a 2 year timeframe for execution would for practical purposes be impossible to achieve.***

Vodafone has in addition had to make a range of simplifying assumptions in order to make the cost modelling exercise manageable. Many of these assumptions, such as the assumption that 3G customers are spread uniformly across the network, are optimistic in terms of the deriving the costs of implementing the previously outlined options and therefore understate the difficulties and costs associated with implementation.

While Vodafone has of necessity had to rely on its own network and cost information in deriving the cost impacts of 900 MHz spectrum loss under the 2 scenarios considered, we have incorporated an adjustment to this information to better reflect the costs facing a 'generic' existing licensee in the event of an adverse spectrum loss scenario arising from an auction.

The combination of the two possible spectrum loss scenarios with the two implementation options considered by Vodafone gives four estimates of the net present value of the likely cost impact to an existing 900 MHz licensee in the event that it was to be unsuccessful in an auction. A discount rate of 10% has been used in obtaining the net present value of these costs, which is more conservative than the 5% discount rate used by ComReg in its estimation of the net present value of the benefits of facilitating an additional entrant to the mobile market using 900 MHz spectrum.

The results of Vodafone's assessment under each scenario and implementation option in terms of both additional base stations required to be built and upgraded, and the overall costs, are set out in the tables below:

Table1: Indicative Number of Additional Base Stations/Upgrades of Existing Sites

[Redacted]

Table 2: Estimated Costs of 900 MHz Spectrum Loss (millions of euros)

[Redacted]

Estimated Costs of 900 MHz Spectrum Loss

Vodafone has estimated that the realisation of Scenario 1 following the conclusion of the proposed 900 MHz spectrum auction would require Vodafone to roll out [Redacted] sites, and to upgrade [Redacted] sites under Implementation Option 1, and to roll out [Redacted] new sites and upgrade [Redacted] existing sites under

Implementation Option 2. Even assuming the extensive use of spectrum optimisation techniques [Redacted] to increase the effective capacity of the 900 MHz network under this scenario, the net present value (NPV) of the costs of implementation would be approximately [Redacted] under Implementation Option 1 and [Redacted] under Implementation Option 2. In addition, the increased number of sites required to provide broadly sufficient capacity and coverage for estimated 2011 network traffic levels [Redacted] would permanently increase operating costs by [Redacted] per annum under Implementation Option 1 and by [Redacted] under Implementation Option 2. The NPV of these permanently increased network operating costs for the respective options at the indicated discount rate would be [Redacted].

With regard to the more intangible costs of these scenarios, as it would not be practically possible for an existing 900 MHz licensee to phase in the required new network capacity in a short 2 year timeframe, sharply increased congestion rates and a minimum estimated [Redacted] increase in dropped call rates would adversely affect end-users for an extended transition period. This would have a material adverse impact on mobile customers, experienced in terms of reduced voice quality and lower data speeds.

These costs would also be experienced not only by the subscribers of the operator or operators attempting to maintain service provision without 900 MHz spectrum (or a reduced allocation), but also by subscribers of other networks when contacting subscribers of the affected operator. There would also be additional substantial impacts on other operators in the context where national roaming agreements and MVNO agreements were in place. If the capacity of an existing licensee's network were reduced by the partial or complete loss of its 900 MHz spectrum usage rights then its ability to offer wholesale services and to compete in the wholesale market would be impaired or eliminated. The quality and coverage problems for the affected operator's customers caused by the loss of 900 MHz spectrum would inevitably also affect the customers of competitors when the latter would be on the affected operator's network, either as a result of national roaming deals or as customers of a MVNO. At a minimum, it would be likely that the affected operator would be unlikely to renew any existing national roaming agreements where it was the hosting network, and it would likely not be in a position to host new MVNOs or to renew existing MVNO agreements on the expiry of their term.

The likely inability of the operator(s) affected by loss of 900 MHz spectrum to compete in the wholesale market, at least for an extended period of time, would soften competition in the mobile market at the wholesale level. Any reduction in the number of players capable of effectively competing in the wholesale market would reduce the bargaining power of new entrants vis a vis the remaining operators capable of hosting them as MVNOs and would restrict the opportunity for new entrants to augment their effective network coverage through national roaming agreements. The intensity of retail competition would diminish markedly as a result which would negatively impact customers in terms of the choice, quality and price of communications services available to them.

There would also be major opportunity costs arising from the inability of the affected licensee to deploy UMTS in the 900 MHz spectrum in this scenario, and the deferral of launch of innovative new products given the need to dedicate finite managerial, financial, and technical resources to addressing the challenge of merely maintaining adequate provision of existing services using reduced spectrum holdings. These costs would not be confined to the affected operator or operators but would also have broad and far-reaching negative effects on both consumers and the overall national

economy. This would be reflected in a large decline in consumer surplus over the relevant period.

The calculation of consumer surplus is notably difficult and for the purposes of estimating the impact of the less tangible costs of spectrum loss on consumers, already highlighted, Vodafone takes as a starting point the estimate of combined consumer and producer surplus (total surplus) from the mobile industry for 2004 of €1,625m as set out in ComReg document 05/01a, 'Preparing the Radio Spectrum Management Strategy for 2005-2007'. It is undoubtedly the case that consumer surplus has increased significantly in the intervening period, as the importance of these services to consumers has increased but given the uncertainty around this value it is conservatively assumed that this value has remained unchanged. Given the robust competition observed in the market, it is reasonable to assume that the majority of the economic surplus now accrues to consumers. Vodafone conservatively assumes that the ratio of consumer to producer surplus is split in a 2:1 ratio. ***If 30% of this consumer surplus accrues to the customers of the network operator affected and the surplus of these consumers is assumed to decline by 25% as a result of the deterioration in service quality and delay in innovation arising from a loss of 900 MHz spectrum by Vodafone then this would mean a present value of lost consumer surplus of approximately €154 million to the customers of the existing licensee that was unsuccessful in a 900 MHz spectrum award process.***

In a competitive market it is probable that Vodafone, or another existing licensee that lost access to 900 MHz spectrum, would be required to provide substantial price discounts and other incentives to existing customers to compensate for reduced service quality and lack of innovative new services relative to other operators. In this case some portion, but not all, of the impact would fall in terms of a further reduction in producer surplus. However the €154 million estimate would remain valid in terms of an additional negative impact on total welfare (the sum of consumer surplus and producer surplus).

However, as already highlighted, the adverse impact of the various spectrum loss scenarios would not be confined to existing 900 MHz licensee(s) affected and their customers, but would also negatively affect the customers of other operators both in terms of reduced customer experience when calling customers of the affected operators or when on the networks of the affected operators as a result of national roaming agreements. Also these other mobile subscribers would be affected by softer retail competition arising from a reduction in the softening of competition in the mobile market at the wholesale level for the reasons previously described.

Vodafone makes the very conservative assumption that the consumer surplus of subscribers other than those of the licensee directly affected would decline by 5% over the relevant period, leading to net present value of additional loss of consumer surplus of approximately €72 million.

Combining the readily quantifiable and more intangible costs that would arise if Scenario 1 were realised gives a range of between [Redacted] depending on whether 1800 MHz spectrum or 2100 MHz spectrum would be used to build out equivalent coverage to that currently provided using 900 MHz spectrum.

Vodafone has estimated that if an existing licensee were unsuccessful in obtaining any spectrum licences in the 900 MHz band in a proposed auction process (Scenario 2) then it would be required to engage in a vast project to roll out [Redacted] new base station sites and to upgrade over [Redacted] existing base station sites under Implementation Option 1, and to roll out [Redacted] new base stations sites and to

upgrade [Redacted] existing base station sites under Implementation Option 2. [Redacted] The costs of Implementation of Option 1 are estimated to be [Redacted], with the costs of Implementation Option 2 being [Redacted] higher than Option 1 [Redacted]. In addition, the vastly increased number of base station sites required would permanently raise the annual network operating costs (energy costs, rental costs, maintenance costs) by [Redacted] under Implementation Options 1 and 2, giving a NPV of these cost increases with a 10% discount rate of [Redacted].

Combining these costs with the €226 million (€154 million + €72million) estimated costs of service disruption and precluded innovation estimated previously for both customers of the existing licensee and the subscribers of competitors that would arise if Scenario 2 were realised gives a range of costs of [Redacted]. The exact cost would depend on whether 1800 MHz spectrum or 2100 MHz spectrum would be used to build out equivalent coverage to that currently provided using 900 MHz spectrum.

It must be emphasised that there is no practical possibility that either Options 1 or Option 2 could be implemented within a 2 year timeframe. It would take many years to complete the network build programme required by either of the two options while the adverse effect on quality of service would be immense.

That costs of this magnitude would be required for operators to maintain service provision in the event of losing all or some of their existing holdings of 900 MHz spectrum, with the associated negative implications for innovation and quality of service, clearly demonstrates the costs and risks arising from ComReg's spectrum auction proposals far outweigh any conceivable benefits.

Moreover the analysis to this point has only considered the case where a single mobile operator with an existing licence in the 900 MHz band were to partially or entirely lose access to 900 MHz spectrum usage rights. However there is clearly a possibility that more than one existing 900 MHz licensee could lose some or all of its current 900 MHz spectrum usage rights in a competitive auction process. If the costs to the second unsuccessful operator of partial or total 900 MHz spectrum loss were comparable to those of the other unsuccessful operator then additional costs in the order of [Redacted], depending on the spectrum loss scenario and implementation option, could be incurred in addition to those previously set out.

Overall Costs of Licensing Options Analysed

Relating the results of the cost analysis above to the 3 licensing options considered in this impact assessment, the costs of ComReg's proposed licensing option 1 (Single Auction Approach) are estimated to be between [Redacted] in the event that an adverse outcome, where a mobile operator such as Vodafone were to lose part or all of its current allocation of spectrum, were to occur. The exact level of the costs would depend on whether all, or only part, of an existing licensees' existing 900 MHz spectrum allocation were lost as an outcome of a competitive spectrum award process, and the implementation option used by the operator to seek to maintain equivalent services to its customers as at present using spectrum usage rights in other frequency bands.

The costs of ComReg's proposed licensing option 2 (Multi Phased Approach) are estimated to be between [Redacted] in the event that an adverse outcome in a competitive award process were to occur. Potential losses here are lower as the possibility of the loss of all 900 MHz spectrum (assuming a favourable outcome on

application for an extension of existing spectrum usage rights for at least 5 MHz of both Vodafone and O2's spectrum) is not considered. However the intangible costs are assumed to remain unchanged given that restrictions on liberalisation of spectrum, and the lack of sufficient spectrum to refarm 900 MHz spectrum to 3G for existing licensees given the need to maintain GSM service to their customers, means that there are also serious adverse implications for innovation in this scenario.

In the event that adverse auction outcomes under licensing options 1 or 2 were to be realised for two existing licensees, costs would be substantially higher, in line with the estimates previously set out above.

Licensing option 3 (Vodafone's preferred option) in contrast to the two licensing options proposed by ComReg, does not entail any risk of imposing substantial costs on mobile operators and their customers as a result of adverse spectrum auction outcomes. This is the case as the renewal of existing 900 MHz licences, and the assignment of 10 MHz allocations to existing licensees, would be concluded on an agreed basis under this licensing option. The cost of licensing option 3 is therefore very low, being largely the costs associated with implementing the agreed approach through engagement with the licensees [Redacted].

Vodafone notes that as an auction process must occur under each of ComReg's 2 proposed licensing options. Vodafone conservatively assumes that the cost of running this auction, and the costs of all stakeholders participating, would be [Redacted]. An auction is not necessarily required by licensing option 3, although this possibility is not excluded, as the remaining 5 MHz block of unallocated spectrum could also be assigned by administrative assignment, or another transparent allocation process to a new entrant to the 900 MHz band.

Assessment of Net Benefits of the Licensing Options

Vodafone notes that in the case where ComReg's licensing options 1 and 2 were to result in a favourable outcome for all of the existing licensees (with each of the 3 mobile operators currently licensed in the 900 MHz band obtaining 10 MHz of paired spectrum) there would be no material difference between the net benefits to society arising from the implementation of any of the three licensing options considered in this analysis. All 3 licensing options would yield the same benefits in terms of permitting scope for market entry of an additional network operator (estimated by ComReg as a NPV of €206 million) and facilitating the deployment of innovative new services in liberalised 900 MHz spectrum (conservatively estimated by Vodafone as having a NPV of €300 million). The only costs would be those incurred by the regulator in administering, and licence applicants in participating in, the competitive award process or in reaching an industry agreement. The present value of the net benefits of each of the 3 licensing proposals would exceed [Redacted] under each option.

However it is not the case that ComReg's proposed Licensing Options 1 and 2 would lead to such a favourable outcome for all of the existing licensees with any certainty. Indeed as previously outlined there is a considerable risk, given the limited amount of 900 MHz spectrum available and the configuration of existing licensee's spectrum assignments, that one or more of the existing licensees would lose part or all of their current 900 MHz spectrum usage rights as a result of the spectrum auction

processes that would arise under both of ComReg's proposed licensing options. The estimates of the present value of the net benefits from ComReg's proposed licensing options under the 900 MHz spectrum loss scenarios analysed are compared with the present value of the net benefits obtained with certainty under Vodafone's proposed Licensing Option 3 in the table below.

Table 3: Net Benefits of Licensing Options (millions of euros)

[Redacted]

The range of the present value of the net benefits estimated for Licensing Options 1 and 2 relates to the dependence of the final net benefit figure on whether an existing licensee lost part or all of its existing spectrum assignment and on whether either the 1800 MHz or 2100 MHz frequencies were relied on by the existing licensee to provide comparable service as currently to its customers following loss of 900 MHz spectrum usage rights.

In the case where an existing licensee obtained no 900 MHz spectrum as a result of a single auction for the entire 900 MHz band (Option 1) and was compelled to re-engineer its network to maintain equivalent service as before to its customers on the basis of reliance on 2100 MHz spectrum (given the uncertainty around continued availability of 1800 MHz spectrum from 2015) then the net present value of the benefits would be negative. Not only would all of the potential benefits of spectrum liberalisation and any additional market entrant be completely offset, but estimated costs, net of all benefits, with a present value of **[Redacted]** would be imposed on society.

Even in the case where an existing licensee were to lose only 2.2 MHz of their current 7.2 MHz paired allocation of 900 MHz spectrum held under an existing licence as a result of an auction process under either of ComReg's proposed licensing options, the net benefits of both licensing options 1 and 2 would be very substantially lower **[Redacted]** than the estimated **[Redacted]** of net benefits from Vodafone's preferred option that would be achievable without any risk of an adverse auction outcome.

It is essential to highlight that there is also a clear possibility under ComReg's proposed licensing options that more than one existing 900 MHz licensees could lose some (under either Option 1 or 2) or all (under Option 1) of their current spectrum usage rights in the 900 MHz band, leading to costs for operators, consumers, and the wider society that would be **[Redacted]** larger than in the case of a single operator. In this possible adverse outcome of an auction process required under either of ComReg's proposed licensing options, the net benefits of both licensing options 1 and 2 would be negative.

It is clear from Vodafone's assessment of the net benefits of the licensing options that while licensing options 1 and 2 as proposed by ComReg entail significant risks of imposing potentially enormous costs on mobile operators and their customers, the costs of Option 3 would be minimal. This is reflected in the much lower estimated net benefits of ComReg's proposed licensing options (and under some scenarios negative net benefits) relative to the large net benefits realisable without significant risk under Vodafone's preferred licensing approach (Licensing Option 3).

The spectrum loss scenarios analysed above are, of course, not certain to occur as a result of ComReg's two new proposed licensing options, and it may even be the case (although it is difficult to determine in the absence for example of clarification of the auction format that would be used) that there is only a modest probability of adverse auction outcomes for existing 900 MHz licensees being realised. However given the limited amount of 900 MHz spectrum available, and the current configuration of existing licensees' spectrum assignments, the risk of negative outcomes certainly exists and is non-negligible.

Given the enormous costs to operators and consumers in terms of increased costs of provision of existing services, reduced service quality or possible service disruption, and delayed or inhibited innovation that would result from adverse auction outcomes however, there is no justification whatever for ComReg to propose licensing options that pose even a modest risk of such outcomes occurring. This is particularly the case when there are no unique benefits from ComReg's new licensing proposals relative to Vodafone's preferred option to offset the costs of adverse auction outcomes, and when the costs of Vodafone's preferred approach would be modest.

In the context where there are no incremental benefits of options 1 and 2 relative to licensing option 3 that would justify the risks of substantial costs to operators, consumers, and the wider society associated with them, it is evident that there is no economic welfare rationale for their implementation. Vodafone submits that Licensing option 3 is clearly the optimal approach to the future licensing of the 900 MHz band and should be selected by ComReg on foot of this assessment.

Hutchison 3G Ireland - Request for correspondence between ComReg and Telefonica O2 as cited on Telefonica O2's response to 09/14 (dated July 21 2009)

Hutchison 3G Ireland Limited
3rd Floor,
6-10 Suffolk Street,
Dublin 2



Mr Samuel Ritchie
Commission for Communications Regulation
Irish Life Centre
Lower Abbey Street
Dublin 1
BY REGISTERED POST AND EMAIL: Samuel.ritchie@comreg.ie

21 July 2009

Dear Samuel

COMREG DOC. NO. 09/14

I refer to the response of Telefonica O2 Ireland ("O2") to ComReg Doc. No. 09/14 and in particular, the following paragraphs:

1. "In its response and second consultation, O2 believes ComReg has based its position on a number of invalid assumptions, however as the consultation process seems to have "moved on" and some of these seem to no longer have a serious implication for ComReg's decision making, O2 has not responded or commented specifically on all of these points in this document, however O2 reserves the right to comment further on any and all of these points if they again become relevant. In addition, there are several aspects to ComReg's current proposals and options that are either undecided yet or are unclear from the consultation document. **O2 has sought clarification from ComReg in relation to a number of these issues during the consultation, unfortunately the response provided little clarity or additional information, which has made it difficult to consider the proposals thoroughly.** O2 may need to make further comments, or vary its response to this consultation as the relevant details are clarified by ComReg."¹
2. "O2 is extremely concerned that ComReg's proposed method for setting the licence fee for any extended licence could make this option unviable. **Clarification on specifically how ComReg is minded to determine the fees for an extension was sought during the consultation, however ComReg was unable to provide any additional information.** ..."²

Hutchison 3G Ireland Limited hereby requests that ComReg provide it with a copy of all relevant correspondence between ComReg and O2.

Yours sincerely


MARK HUGHES
Head of Regulatory

¹ Page 2 of O2's response.

² Page 9 of O2's response.

Canning Fok, British
Susan Chow, British
Frank Sivt, Canadian
Edith Shah, British
Robert Finnegan, Irish
Kevin Russell, British

A Hutchison whampoa company

Registered Office:
3rd Floor, 6-10 Suffolk Street,
Dublin 2, Ireland
Registered Number:
316982
Place of Registration:
Republic of Ireland

**ComReg - Reply to Hutchison 3G Ireland correspondence of
July 21 (dated July 23 2009)**



Commission for
Communications Regulation

23 July 2009

Mr Mark Hughes
Head of Regulatory
Hutchinson 3G Ireland Ltd
6-10 Suffolk St
Dublin 2

Dear Mr Hughes

COMREG DOC. NO. 09/14

I refer to your letter of 21 July 2009 in which Hutchison 3G Ireland Limited (H3GI) requests a copy of all relevant correspondence between the Commission for Communications Regulation (ComReg) and Telefonica O2 Ireland pertaining to the matters set out in paragraphs 1 and 2 of your letter.

As you are aware, the Freedom of Information Act, 1997, as amended, provides a mechanism by which the public can gain access to information held by ComReg that is generally otherwise not available.

In these circumstances, you might wish to consider making such an application.

Yours sincerely

Samuel Ritchie
Manger Spectrum Operations

**ComReg - Acknowledgement of Vodafone Ireland
correspondence of August 25 (dated August 28 2009)**



Commission for
Communications Regulation

28 August 2009

Mr Gerry Fahy
Strategy Director
Vodafone Ireland Limited
Mountainview
Leopardstown
Dublin 18

Re: ComReg's Consultation No 09/14

Dear Mr Fahy

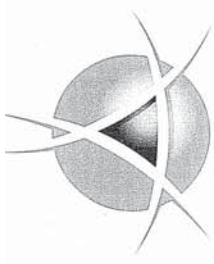
On behalf of Commissioner Alex Chisholm of the Commission for Communications Regulation, I refer to your letter of 25 August 2009 in relation to the above.

We will consider your response to the questions raised and we will get back to you in due course

Yours sincerely

Susan Coyle
Commissioner's Office

ComReg - Reply to Vodafone Ireland correspondence of 25 August (dated September 2 2009)



Commission for
Communications Regulation

2 September 2009

Mr Gerry Fahy
Strategy Director
Vodafone Ireland Limited
Mountain View
Leopardstown
Dublin 18

Re: Vodafone's follow up letter concerning issues discussed during the bilateral meeting of 9 July.

Dear Mr Fahy

Thank you for your letter of 25 August 2009, which was submitted to the Commission for Communications Regulation (ComReg) as a follow-up to the bilateral meeting between ComReg and Vodafone Ireland Limited (Vodafone) held on 9 July regarding ComReg's on-going GSM liberalisation consultation.

As your letter addresses a number of issues raised by ComReg during this bilateral meeting, ComReg considers that your letter forms part of Vodafone's presentation in connection with this meeting.

In accordance with the basis on which this bilateral meeting was held, as set out in ComReg's letter to Vodafone dated 19 June 2009, and in the interests of transparent decision-making more generally, ComReg intends to publish a non-confidential version of your 25 August letter. Accordingly, I would be grateful if you would furnish a non-confidential version of your 25 August letter within seven (7) days of receipt of this letter.

As noted in ComReg's letter of 19 June, ComReg's further response to consultation will take into account, amongst other things, your letter of 25 August.

In the mean-time, and as a preliminary observation, ComReg staff would query the appropriateness and validity of the cost and service implication analysis submitted in your letter of 25 August without reference to 1800 MHz spectrum use, particularly in circumstances where Vodafone's 1800 MHz spectrum rights of use extends to December 2014.

Yours sincerely

Samuel Ritchie
Manager Spectrum Operations

An Coimisiún um Rialáil Cumarsáide

Commission for Communications Regulation

Abbey Court Irish Life Centre Lower Abbey Street Dublin 1 Ireland
Telephone +353 1 804 9600 Fax +353 1 804 9665 Email info@comreg.ie Web www.comreg.ie

**ComReg - Further follow up correspondence concerning
bilateral meeting with Vodafone Ireland on July 6 (dated
September 14 2009)**

14 September 2009

Mr Samuel Ritchie
Manager Spectrum Operations
Commission for Communications Regulation
Irish Life Centre
Lower Abbey Street
Dublin 1,

Re: Vodafone's follow up letter concerning issues discussed during bilateral meeting of 9 July

Dear Samuel,

Thank you for your response to Vodafone's letter following up on issues discussed at the 9 July bilateral meeting in relation to ComReg's ongoing 900 MHz and 1800 MHz spectrum consultation.

Vodafone has separately provided a non-confidential version of our letter of 25 August as requested and appreciates that the points raised in this correspondence will be taken into account in ComReg's further response to consultation.

With regard to ComReg's preliminary observation regarding the role of 1800 MHz spectrum use in the cost and service implication analysis, Vodafone acknowledges that our existing 1800 MHz spectrum rights of use are not due to expire until the end of 2014. However we consider that it would not be appropriate to plan on utilisation of our existing 1800 MHz spectrum rights of use to compensate for a reduced 900 MHz spectrum allocation. This is because the remaining period to expiry of the existing 1800 MHz usage rights is too short and there is no visibility around whether Vodafone will continue to have access to 1800 MHz spectrum from 2015.

Currently Vodafone's spectrum licence in the 2.1 GHz band confers the only rights to use frequencies that are available to us with certainty over the longer term (with an initial expiry date of 2021). If Vodafone were to proceed to accommodate a reduced 900 MHz spectrum allocation using 1800 MHz spectrum rather than 2.1 GHz spectrum then we would face a significant risk of having to engage in a further substantial and costly implementation programme within the next 3-4 years in the event that we were to fail to obtain renewal of our existing 1800 MHz spectrum usage rights. This would not be consistent either with efficient business planning or with the promotion of the welfare of our customers.

Yours Sincerely,

Gerry Fahy
Strategy Director

Vodafone Ireland Limited

MountainView, Leopardstown, Dublin 18, Ireland
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Registered Office: MountainView, Leopardstown, Dublin 18. Registered in Ireland No. 326967
Directors: Charles Butterworth (CEO) (UK), Gerard Fahy, Alfred Kane, John Kent (UK), Daniel Maher, John Otty (UK), Brian Patterson (Chairman).

Your ref:
Our ref:
M
T
F

Intel Corporation - Correspondence concerning stakeholder statements regarding 2.3 GHz equipment availability (dated September 29 2009)

From: Gibson, Peter [mailto:[redacted]]
Sent: 29 September 2009 14:56
To: Jim Connolly; Tara Kavanagh; Samuel Ritchie
Cc: Kevin Kennedy; Arefi, Reza; Gibson, Peter
Subject: 2.3 GHz status in APT

Dear All,

I attach for your information the work of APT who intend responding to the ITU-R WP5D on the issue of channel arrangements for the 2300 – 2400 MHz band. You will note that there is good support for TDD and on a channelisation that we have intimated to you in the past, i.e. 5 MHz blocks starting at 2300 MHz up to the top of the band, the Malaysian example shows it well.

[redacted]

I would also like to raise an issue relating to the recently published meeting notes on the future use of the 900 and 1800 MHz from Meteor. I feel compelled to set the record straight on the following comments made by Meteor with respect to the 2.3 GHz band.

“Consultation on potential award in advance of ITU plan – extreme caution required”

The attached document outlines very well the proposal from region 3 and it is fully aligned with the support for a TDD channel arrangement and the use of 5 MHz blocks across the full 100 MHz of the band.

“Meteor noted it is highly probable that equipment will be available to support advanced mobile services in the 1800MHz band in advance of the 2300MHz band which has been identified internationally for mobile expansion. ComReg is currently consulting on the potential release of spectrum in the 2300MHz band and Meteor urged that a cautious approach be taken to ensure that strategic mobile spectrum resources in Ireland are not inadvertently critically constrained.”

Meteor are incorrect to state that equipment for the 2300 MHz band is currently unavailable and the two examples in South Korea and Malaysia demonstrate a very strong eco-system supporting devices in this band for WiMAX technology. Over 50% of the S.Korea population is currently covered by WiMAX with >250K subscribers. In Malaysia the main operator deploying WiMAX is Packet One who will announce next month the 100K subscriber landmark. They continue to aggressively deploy their network across Malaysia.

Intel would of course suggest that strategically the release of spectrum suitable for commercially available technologies today should not be unnecessarily delayed.

I would be happy to provide any further evidence/information you may require?

Regards

Peter

Peter Gibson

**Intel Corporation
EMEA Communications Policy Team
Global Public Policy**

**Hutchison 3G Ireland - Correspondence concerning Vodafone
Ireland's proposal published in redacted bilateral minutes
09/73 (dated October 8 2009)**



Mr Alex Chisholm, Commissioner
Commission for Communications Regulation
Irish Life Centre
Lower Abbey Street
Dublin 1
BY REGISTERED POST AND EMAIL: alex.chisholm@comreg.ie

8 October 2009

Dear Alex

LIBERALISING THE FUTURE USE OF THE 900 MHZ AND 1800 MHZ SPECTRUM BANDS AND SPECTRUM RELEASE OPTIONS

I refer to ComReg Doc. No. 09/73 "*Liberalising the Future use of the 900 MHz and 1800 MHz Spectrum bands & Spectrum Release Options – Publication of the non-confidential minutes of bilateral meetings*" and in particular, Vodafone's alternative licensing proposal (Attached). In summary, Vodafone proposes:

1. The existing licensees each obtain rollover of one block of 5 MHz for at least 15 years (3 blocks);
2. A new band entrant obtains one block of 5 MHz for the same period;
3. Existing licensees obtain an additional 2.8 MHz. The existing licensees hold this together with the 2.2 MHz the existing licensees already hold (ie three blocks of 5 MHz) until 2015;
4. In 2013, ComReg auctions the 3 blocks held until 2015 together with all of the 1800 MHz spectrum and the Digital Dividend (800 MHz);
5. All spectrum in the 900 MHz band is fully liberalized at the outset; and
6. Access fees for the proposed extensions (7.2 MHz) are determined by a transparent methodology, clearly defined prior to the auction for currently unallocated spectrum, where the information on market valuations of the spectrum realised from the auction of the unallocated 5 MHz of spectrum in the band in 2009 or 2010 would be the key data input.

Vodafone's proposal is anti-competitive and an attempt to pre-determine the future shape of the retail mobile communications market in Ireland. It prevents Hutchison 3G Ireland Limited ("H3GI") from acquiring 2 x 10 MHz of 900 MHz spectrum until 2015. It is illegal and contrary to, *inter alia*: (i) sections 12 (1), 12 (2) and 12 (3) of the Communications Regulation Act, 2002, as amended; (ii) regulation 23 (1) of the European Communities (Electronic Communications Networks and Services)(Framework) Regulations, 2003, as amended; (iii) European Community

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State Aid law; and (iv) ComReg's stated position in respect of licence renewal, licence retention and spectrum liberalisation.¹ H3GI will strenuously oppose any such proposal.

Yours sincerely


MARK HUGHES
Head of Regulatory

Encl.

¹ At pages 34, 35 and 37 of ComReg Doc. No. 09/14, "*Liberalising the Future Use of the 900 MHz and 1800 MHz Spectrum Bands & Spectrum Release Options – Response to Consultation 08/57 & Further Consultation*".

Canning Fok, British
Susan Chow, British
Frank Sixt, Canadian
Edith Shih, British
Robert Finnegan, Irish
Kevin Russell, British

A Proposed 900 MHz Licensing Approach Consistent With Effective GSM Migration

This approach would have the following elements:

1. Existing licensees would obtain rollover of 2 X 5 MHz of their current 2 X 7.2 MHz assignments in the 900 MHz frequency band for a period of at least 15 years.
2. All existing 900 MHz licensees would also be allocated an assignment of an additional 2 X 2.8 MHz of 900 MHz, contiguous with their current spectrum allocation. This spectrum, together with the other 2 X 2.2 MHz of spectrum in their existing spectrum assignment not covered under the minimum 10 year extension proposed at point 1, would be held by the existing licensees until a date corresponding with the current expiry date of Meteor's license i.e. mid 2015.
3. In mid 2015, each of the existing licensees would relinquish the 2 X 5 MHz of spectrum usage rights in the 900 MHz band held by them on the basis of the short term extension. This 2 X 15 MHz of spectrum would become available for re-assignment at this stage as a result of the outcome of a competitive award process.
4. All spectrum in the 900 MHz band would be fully liberalised at the outset so as to allow the deployment of UMTS technology in the band. This would also permit the most efficient use of the total of 2 X 10 MHz of spectrum assigned to each existing licensee for the purposes of providing both GSM and UMTS 900 services in parallel for an extended transition period.
5. As part of this approach, the remaining currently unallocated 2 X 5 MHz of 900 MHz spectrum in this band not included within the rollover and assignment measures previously mentioned would be allocated by ComReg to a new entrant to the band by means of an auction in 2009 or 2010. The term of this license would coincide with the 2 X 5 MHz granted on a rollover basis to the existing 900 MHz licence holders for a minimum period of 15 years.
6. All existing 900 MHz licence holders would at the outset sign a binding Memorandum of Understanding/agreement consenting to facilitate contiguous spectrum blocks through retuning/realignment of frequencies as appropriate as a condition of being assigned an additional 2 X 2.8 MHz of spectrum and being granted the extension to their existing spectrum licences.
7. In 2013, two years prior to the current expiry date of Meteors licence in May 2015, ComReg would auction 2 X 15 MHz of spectrum in the band. This auction should also include all an award process for all the spectrum in the 1800 MHz band (both currently unallocated and that held by existing licensees whose usage rights are currently due to expire from 2015) and the Digital Dividend spectrum in the UHF band

that will be freed up by digital switchover of the terrestrial broadcasters.

8. As part of this auction, a 10 MHz per operator overall spectrum cap for 900 MHz spectrum would be in place, but existing licensees would not be prevented from participating in the auction.
9. Following the auction, spectrum usage rights held under licences would be re-aligned as necessary in order to give all operators blocks of contiguous spectrum. The re-alignment would be carried out in accordance with the principle of achieving this outcome while minimising the extent of the re-alignment required for all licensees.
10. Access fees to be paid for the proposed extensions of spectrum usage rights retained under the licences held by the existing 900 MHz licensees (2 X 7.2 MHz of spectrum for each operator) would be determined by a transparent methodology, clearly defined prior to the auction for currently unallocated spectrum, where the information on market valuations of the spectrum realised from the auction of the unallocated 5 MHz of spectrum in the band in 2009 or 2010 would be the key data input. Existing licensees would have to pre-commit to paying the price determined as an outcome of this process as a condition of the extension of their existing licences.

This spectrum allocation approach set out above is dependent on the existing licensees consenting to the proposed amendment to the duration and nature of their spectrum usage rights and signing the proposed Memorandum of Understanding. Vodafone considers that the likelihood of securing agreement across the existing 900 MHz licensees to adopt this approach is very good as there are strong incentives for existing licensees to support an approach that assures them of certainty around the availability of at least their current allocation of spectrum to maintain existing services to their customers, while also providing them with the opportunity to acquire additional spectrum up to a 10 MHz limit to enable them to deploy UMTS in the band. ComReg should therefore seek agreement from the existing licensees on such an approach.

Advantages of the proposed approach

1. Compliant with ComReg's objectives. This option has considerable merit when assessed against ComReg's statutory regulatory objectives under the 2002 Communications Regulation Act and other relevant public policy criteria.
2. Regulatory certainty. The renewal of existing 900 MHz licences (with an additional 2.8 MHz included within these assignments) without an auction until at least 2015 ensures a necessary level of regulatory certainty.
3. Business certainty. It enables existing 900 MHz licensees to plan and invest for the long term since a minimum of 5 MHz is guaranteed until 2025 with the possibility of a further 5 MHz being made available through an auction.
4. Minimises disruption. This proposed approach avoids the serious risks of disruption, and the substantial costs for operators and end users as described

in Vodafone's submission to ComReg's initial 900 MHz licensing consultation (ComReg document 08/57) and in Vodafone's Impact Assessment.

5. Smooths transfer to next generation services. The liberalisation of all 2 X 10MHz of spectrum assignments allocated to existing licensees will facilitate a timely and efficient migration to enhanced services and more ubiquitous broadband coverage, driven by customer demand.
6. Additional Spectrum availability. The extension of usage rights until 2015 is further justified since it can be reasonably expected that additional spectrum in other bands (UHF band, 1800 MHz) will become available at this time, coinciding with the needs of existing licensees and possible new entrants. In 2015, spectrum is foreseen to be available from the following sources;
 - a. 2 X 15 MHz of 900 MHz spectrum handed back by current GSM licensees.
 - b. 1800 MHz spectrum available following the expiry of the current licences
 - c. Currently unallocated 1800 MHz spectrum
 - d. A minimum of 2 X 72 MHz of spectrum in 790-862 MHz sub-band (analogue switch-off due in September 2012).
7. Increased competition. Guarantees an immediate new entrant to liberalised 900 MHz band (assuming successful auction outcome). Subsequently a new entrant to the band would be able to participate in an auction to obtain additional 900 MHz spectrum if they wished to do so.
8. Incentivises innovation. Since all of the 2 X 10 MHz of spectrum allocated to existing 900 MHz licensees is liberalised (and priced accordingly), operators are incentivised to maximise value by delivering enhanced services to their customers.

Disadvantages of the proposed approach

1. Uncertainty around 900 MHz spectrum holdings in long term. No certainty that existing operators would have more than 2 X 5 MHz allocation of 900 MHz spectrum from 2015. Risk that if aggressive targets for migration of existing GSM customers to UMTS are not achieved then some issues of disruption to provision of legacy services after 2015 will remain. Availability of alternative spectrum at this point will mitigate but not eliminate this risk. Some provision for continued provision of a legacy service by at least one operator in the 900 MHz band may have to be made.
2. Requires broad industry agreement. Broad agreement is likely from existing licensees given incentives to avoid disruption and achieve maximum regulatory certainty. However there is a risk of disagreement/legal challenge by a party or parties that are not current licensees in the band. This could be addressed through open and transparent public consultation on the proposals by ComReg.
3. Uncertainty around pricing of spectrum usage rights. This approach envisages that the price paid for extensions to the duration of, and the additional spectrum granted to, existing 900 MHz licences would be derived

from the outcome of the auction for the single unallocated 2 X 5 MHz spectrum lot in 2009 or 2010. As the outcome of the process would not be known prior to the finalisation of this licensing approach however, existing licensees would be required to make open-ended commitments to pay a price related to the outcome of that auction. It is possible that this price could exceed their economic valuation of the spectrum. This disadvantage can be mitigated through a transparent pricing methodology with the minimum complexity which is known from the outset.

**ComReg - Reply to Hutchison 3G Ireland correspondence of
October 8 (dated October 9 2009)**



Commission for
Communications Regulation

9 October 2009

Mr Mark Hughes
Head of Regulatory
Hutchison 3G Ireland Limited
3rd Floor
6-10 Suffolk Street
Dublin 2

Dear Mr Hughes,

**Re: Liberalising the future use of the 900 MHz and 1800 MHz spectrum
bands and spectrum release options**

I refer to your letter of 8 October 2009 to Commissioner Chisholm regarding Vodafone's alternative licensing proposal.

The Commission for Communications Regulation's further response to consultation will take into account, amongst other things, the matters set out in your letter.

In this regard, I note that you have not identified any part of your letter as being confidential in nature. Accordingly, ComReg proposes to publish your letter in its entirety with its further response to consultation.

Yours sincerely,

Samuel Ritchie
Manager Spectrum Operations