

## IET response to:

### Ofcom consultation on 'Assessment of future mobile competition and proposals for the award of 800Mhz and 2.6Ghz spectrum and related issues'

#### Preamble

The IET provides answers to selected specific questions below, but wishes to emphasize that we think Ofcom has a crucial opportunity at this time to ride the wave of a major technological change we foresee in convergent wireless and superfast broadband systems. Correct decisions here may vitally affect the UK's position, for both suppliers and users, in years to come. As such, decisions will be required to make a careful balance between providing security for investors and allowing maximum flexibility for future systems and services, including those that may be offered by new players. A portfolio of licence responses across the available spectrum seems sensible.

In view of its importance the IET held a special industry meeting in preparation for this response on 18<sup>th</sup> May to review aspects of this issue. Ofcom staff contributed – the presentations and summary are available.

The key changes we foresee are:

- A shift in the balance of wireless systems towards much larger numbers of much smaller cells with much higher performance ("**Super-High-Density**' wireless). This goes with a shift enhancing the role of '**inside-out**' customer-owned, premises-based systems, like WiFi & femtocells, compared with the more traditional 'outside-in' mobile technologies. Overall this looks the only practical way of delivering the superfast wireless / un-tethered systems that we believe will dominate future communications. This is equally vital to maintain the UK's dominance for content.
- This implies close **integration between the wireless and superfast broadband** infrastructures. This will require some common architecture and Ofcom should encourage **interoperability and standards** between cellular and wifi, and other relevant modes. We are now in a multimode and multi technology world, though Ofcom should not be unduly prescriptive here. Wireless systems of all kinds may face backhaul bottlenecks unless broadband objectives are achieved. There may also be significant changes in operators and ownership patterns.

We also specifically note that:

- Ofcom may be **unduly risk-averse with regard to interference** in digital wireless systems. Failure was predicted for WiFi on interference grounds, as for DSL and in other cases, although this has not materialised. Modelled worst-case scenarios may indeed occur occasionally but may be insignificant for the system as a whole, and increasingly amenable to mitigation by smart infrastructure. Such risks, for example from overlapping high- and low-power spectrum could be effectively passed to licensees who would make their own assessments and probably agree a compromise).
- Ofcom has a duty to **promote innovation** and as part of this needs to try important new ideas, such as overlapping spectrum use, since real-modelling

and small-scale testing can only go so far and clearly have serious limitations. This also applies to measures of % population reached for example.

- **Services competition.** This may be as important as competition for spectrum.
  - There is also some opportunity to promote new business models and players in the more complex '**combinatorial**' environment that new smart terminals will face.
  - Dividing up spectrum in a salami slicing approach may increase competition at the network level, but actually reduce capacity and available speeds. It is therefore more important to SME's, innovation and the economy overall to encourage "services competition" even if there is less (capital intensive ) "network competition".
  
- **Convergences** Many new communications markets and technologies are strongly, and increasingly, interconnected. For example:
  - **Femtocells** in particular – and other wireless developments effectively assume the roll-out of superfast (fibre) broadband. Wireless is getting shorter range in order to drive capacity but this also assumes more fast fibre core. These will increasingly go hand-in-hand since they are not distinct developments but are both part of a converging national infrastructure. It is important that wholesale / backhaul choice, pricing and quality is kept under full review to ensure this does not become the real bottleneck to investment and deployment of broadband infrastructure
  - It is impractical to consider only the UK position here – the **International** dimension is vital.
  - Even within the UK Government appears to be discussing rather separately 4 big **UK infrastructure projects** based in Communications;
    - Rural Broadband
    - Emergency Services Broadband
    - Smart metering and smart grid
    - Transportation/Congestion management

These should be brought together to save money, offer better coverage and resilience.
  
- It is clear that although spectrum usage in specific bands may be close to fundamental Shannon limits, the overall present usage of spectrum is **extremely inefficient** by many measures, both economic and technical. It is important to get the right measure nonetheless. A possible economic measure would be the UK economic benefit obtained per MHz of used

spectrum, noting that this is not the same as auction value and so unlicensed spectrum may be more valuable than licensed.

## **Responses on selected specific Consultation questions**

**Question 4.2: If we were to offer shared access low-power licences in some way, do you have any comments on the appropriate technical licence conditions which would apply for the different options?**

### IET Advice

*The IET supports one option: allowing unlicensed low-power devices to co-exist in a 2x20GHz band with a macro-network, where the macro-network owner has purchased the licence for that band in the full knowledge that such low-power devices may exist in significant numbers. Under such conditions 30dBm EIRP maximum output and 10m antenna height is appropriate with the proviso that such low-power devices 'back off' (as they do now) if they encounter signals from other devices. Whilst it is likely that this will be adequate, it would be useful if provision could be made for the each small cell to be able to declare its location, power output policy and average and peak power output to a nominated service provider.*

### Interests of citizens and consumers

*The technical conditions would enable citizen consumers to enjoy services based on small cells in the widest range of circumstances whilst minimising the effect on the services of others.*

### Supporting Evidence

*The evidence for this position has already been presented in the report by Real Wireless ("Low-power shared access to spectrum for mobile broadband Ofcom Project MC/073"). The IET considers that the likelihood of interference between small cells and between small cells and the macro network is minimal and that the benefits of choice, competition and potential innovation outweigh any cost arising from degradation of the macro-based service sharing the same band. If the macro-network operator is aware of this, then they should be able to plan their auction bid, and, if successful, their macro-network network accordingly.*

*Furthermore evidence suggests that although there were many predictions of interference from WiFi, the actual outcomes were nothing like as bad (see for example "Estimating the Utilisation of Key Licence-Exempt Spectrum Bands, Mass Consultants for Ofcom, May 2009"). The protocols associated with small cells make such interference much less likely to cause problems.*

**Question 5.2: Do you agree there is a material risk of a significant reduction in the competitive pressures, at least to provide higher quality data services, in retail and wholesale markets without measures in the auction to promote competition? Please state the reasons for your views.**

IET Advice

*The IET agrees there is a material risk a significant reduction in the competitive pressures and suggests that it would be better to have one 2x20GHz band for a macro-network, where the macro-network owner has purchased the licence for that band in the full knowledge that low-power devices may exist in significant numbers in the same band.*

Interests of citizens and consumers

*It is in the interest of the citizens and consumers that all measures are taken to maximise competition.*

Supporting Evidence

*It is in the interests of the established mobile network operators to acquire more spectrum and the auction runs too high a risk of further entrenching their position. The auction provides an opportunity to create a new kind of market: one where the competition does not depend on ownership of spectrum, and in doing so will provide fresh impetus for innovation.*

**Question 5.3: Do you agree there is a risk of potentially beneficial sub-national RAN uses not developing without measures to promote competition? Please state the reasons for your views.**

*Answer as for 5.2.*

**Question 5.6: Given the measures we propose to take to ensure four holders of spectrum portfolios sufficient credibly to provide higher speed data services, do you agree that it would not be appropriate or proportionate to introduce a regulated access condition into the mobile spectrum licences to be awarded in the combined award?**

IET Advice

*Ofcom should take reserve powers now in the combined award to introduce a regulated access condition under the circumstances where the UK market is failing to deliver an effective choice of broadband mobile coverage and/or quality of data speed or coverage is balkanising to the detriment of citizens and consumers*

Interests of citizens and consumers

*Ofcom cannot discharge its duties to citizens and consumers if they lack the regulatory tools.*

Supporting Evidence

*Competition at the network infrastructure level is trending in the wrong direction and whilst the measures Ofcom are proposing may lead to a helpful slowing down of this adverse trend there is a high probability Ofcom are winning the battles but losing the war. Ofcom will then*

*have step in to redress competitive under-performance. One of Ofcom's major weaknesses is that its powers often do not match its duties. It must be in Ofcom's interest to take every opportunity open to acquire new regulatory tools. A regulated access condition is one such tool Ofcom will need, In which case, it is fairer to the industry to make this explicit now. We do not believe that this will discourage investment or innovation and the evidence for this is the tsunami of data demand hitting the mobile phone networks which will drive them to acquire and use all the internationally harmonised spectrum that they can lay their hands on.*

**Question 5.7: Do you consider that we should take measures to design the auction to assist low-power shared use of 2.6 GHz? If so, what specific measures do you consider we should take?**

**Mobile coverage and related issues**

#### IET Advice

*The IET supports one option: allowing unlicensed low-power devices to co-exist in a 2x20GHz band with a macro-network, where the macro-network owner has purchased the licence for that band in the full knowledge that such low-power devices may exist in significant numbers. Ofcom needs to ensure that service providers offering interconnection between such small cells and mobile and fixed networks are able to do so on fair and reasonable terms and to actively police this and take rapid action if such terms are not observed.*

#### Interests of citizens and consumers

*The interests of the citizens consumers are best served if there is the maximum competition, diversity of supply and of business model to provide services. All these criteria would best be met by allowing citizen consumers maximum choice over installing their own small cell and choosing a service provider without being tied to one operator*

#### Supporting Evidence

*Allowing unlicensed low-power devices is supported by a report commissioned by Ofcom from Indepen, Aegis and Ovum (December 2006) which showed that the economic value per MHz of unlicensed spectrum was in general far higher than that of licensed; this is likely to be due to the greater scope for innovation in technology and business models which results from unlicensed access. The IET has also been made aware of a private communication from Smarter Mobile Limited which sets out the reasons why DECT guard bands have not been exploited commercially and the difficulties which they have encountered; this communication makes it clear that both terms for interconnection and the absence of a 'use it or lose it' clause have been instrumental in damaging competition.*

**Question 6.1: Do you have any comments on the proposal to include in one of the 800 MHz licences an obligation to serve by the end of 2017 an area in which 95% of the UK population lives, while providing a sustained downlink speed of 2Mbps with a 90% probability of indoor reception? Do you think there is another way of specifying a coverage obligation that would be preferable?**

*IET Advice*

*1. The value of a coverage obligation is best measured by the improvement it brings about at the core infrastructure level in the areas where the last 5% of the population live. This broadly equates to the number of new base stations with broadband back-haul that it creates.*

*2. The IET offers Ofcom a straw-man figure of 1400 new base stations at an approximate cost of £250m*

*3. The IET suggests that new thinking might be useful in how to best implement this coverage improvement for example as an alternative to the old way of a licence condition based upon a % of the population - Ofcom might retain a sum of money from the auction proceeds from one of the 800 MHz licences and run a reverse auction to select the mobile operator(s) to deliver the rural coverage up-grade.*

*4. The IET does have reservations on the proposed coverage definition itself. It is inordinately complex, has made a number of arguable assumptions and may generate more problems than it solves.*

*Interests of citizens and consumers*

*“Coverage” is one of the main attributes of a mobile infrastructure and one that that citizens and consumers attach a high importance to. It has been trending in the wrong direction for the past 10 years. The switch of consumer interest to mobile access to the Internet will raise a whole new class of coverage issue around inadequate access speeds.*

*Supporting Evidence*

*A pure market oriented approach to delivering the coverage citizens and consumers seek has clearly failed. Basic voice coverage issues that existed 10 years ago still exist today as a result of Mobile Operators switching their priorities to rolling out 3G. The speed of 3G roll out was disappointing with coverage today still patchy in places where coverage maps show a more favourable picture. This in part has occurred as mobile operators have been conflicted between investing in more capacity in the existing 3G coverage area and extending/improving that coverage. Underlining this is a worrying trend of capacity improving at the expense of coverage shrinking for higher mobile access speeds.*

**Question 6.4: Do you have any comments on our proposal not to use the combined award to address existing not-spots?**

IET Advice

1) Ofcom are to be congratulated in coming up with an imaginative new approach to addressing coverage not spots. Providing they can convince the Treasury to allow the scale of resources that match the scale of the problem. Including poorly covered rail links, there is no reason of principal why these problems should also be solved by the combined award.

2) Whilst we understand that the coverage “not spots” have to be addressed with the spectrum and technology in use today, rather than the new spectrum, it is important that any new base station sites brought about by this alternative mechanism have a provision for the later up-grading of those sites to 800 MHz LTE.

Interests of citizens and consumers

The “coverage not spots” are a significant aggravation to very large numbers of people both living in the “coverage not spots” or passing through them. It must make sense for the relatively small incremental cost for the solution to these coverage not spots to be within the framework of a road map that brings very fast “narrower band” whilst bringing full mobile broadband coverage over a suitable time period.

Supporting Evidence

Ofcom no doubt already have a quite full archive of mobile coverage complaints to justify the action they are proposing.

**Question 6.5: Do you have any comments on our proposal not to impose ‘use it or sell it’ obligations but to consider including an additional power to revoke during the initial term of the licences?**

IET Advice

The IET suggests that there is an alternative to a “use it or sell it” option and we point to the housing market and the way long standing empty properties are addressed. Here a local authority can impose a tenant on the owner of an empty property without removing the property rights of that owner. Thus a better approach might be to begin with the same “use it or...” trigger but the sanction is for Ofcom to find a rent paying sub-tenant for that idle spectrum.

Interests of citizens and consumers

There is no doubt that the performance of LTE networks can be considerably enhanced with wider radio channel widths and rural communities in particular would benefit with much improved access speeds.

### Supporting Evidence

*There are pockets of spectrum across many frequency bands in remote rural areas that are unused and likely to remain so. A mobile operator is unlikely to respond positively to the idea of their spectrum being used in these pockets by somebody else since there is always a fear that it may prevent something the mobile operator might want to do in the future. The economic rent for that spectrum in rural areas is too low to overcome this reluctance.*

**Question 7.3: We welcome views on the merits of the proposed approach to information provision, in particular concerning the type of information that may be helpful and any impacts that publication of information might have both on licence holders and the wider spectrum market.**

### IET Advice

*The IET agree with the approach of providing information to facilitate optimal spectrum use. In addition to the types of data suggested by Ofcom we would note that small cells should be able to declare location, power output policy and average and peak power output to a nominated service provider and that these should be made available in anonymised and aggregate form to any co-existing macro-network operator. The IET also recommends that some form of spectrum monitoring be used to check usage on a long term basis.*

### Interests of citizens and consumers

*The interests of citizens and consumers are best served by the maximum amount of information being available to the market, thus ensuring efficient competition.*

### Supporting Evidence

*Efficient markets require good information. Declaration of use based on administrative records is a good first step, but their interpretation depends on spectrum planning models predicting outcomes. Having measurement data – in the form of declarations by small cells and long term monitoring of the use of spectrum would greatly assist in making the correct investment and purchasing decisions.*

**Question 8.2: Are there other factors that we should consider to develop our approach to packaging? If so which ones and why?**

*See answer to Q5.7*

**End of submission**