

**DIGITAL TELEVISION :
THE PRINCIPLES FOR SPECTRUM PLANNING**

Response by BSkyB

1. Sky welcomes the opportunity to respond to Government's consultation on the principles for spectrum planning.
2. As Government is aware Sky has already made a very substantial contribution towards Government's objective of migrating UK consumers to digital television and making the UK the most dynamic and competitive market for digital TV in the G7. Some 5.7m homes, or 15m people, in the UK obtain digital television services by subscribing to Sky Digital. Combined with free-to-air digital satellite, digital terrestrial and digital cable, approximately 37% of homes in the UK have access to digital television.
3. Digital television is a UK success story which has largely been driven by the commercial sector. Further progress will be made. Analysts predict that digital television will be in 70% of homes by 2006 ¹.
4. Free-to-view digital television, and digital terrestrial television generally, has, however, been less successful in attracting consumers to digital television. In large measure, consumers who have adopted digital television have opted for the vastly greater choice of linear, enhanced and interactive services available on digital satellite (or the 'triple play' offered by cable). Relatively few had chosen to switch to digital television for the free-to-view services alone or for the comparatively limited increase in choice and interactivity available from pay DTT. Whether this changes with the introduction of free-to-air cheap set-top boxes remains to be seen.
5. Sky acknowledges that there will be some in the UK who are disinclined or unable to join in the digital revolution. Sky agrees that such people should not be disenfranchised or excluded from receiving the existing analogue terrestrial public service channels (i.e., BBC 1, BBC 2, ITV, Channel 4/S4C and Channel 5) if or when analogue terrestrial transmission is switched off. Sky considers, therefore, that Government's principles for spectrum planning should focus on whether and how to deliver those channels to this group of people, i.e., the homes who do not voluntarily migrate to digital television.

¹ Merrill Lynch Media Handbook January 2002

6. In relation to those who convert themselves to digital television the question of how to ensure that everyone who currently receives free-to-view analogue TV channels receives those channels digitally does not arise. Those channels are available in those homes, with continued carriage after switch-off also guaranteed on all platforms either through the imposition of must carry obligations on cable operators ² or through conditional access regulation.
7. Against this background Sky's response addresses the following matters:
- the role of satellite in achieving analogue terrestrial switch-off and measures which must be taken to facilitate satellite's role; and
 - Sky's suggested digital terrestrial spectrum planning option for delivering the public service broadcasting channels.

Sky's response to the questions set out in the consultation document is in Annex 1 and detailed comments on parts of the document are in Annex 2.

The Role of Satellite in Achieving Analogue Terrestrial Switch-Off.

8. The principal and uncontested public policy concern is that everyone should have access after switch-off to the digital versions of BBC1 and 2, ITV, Channel 4 and S4C, and Channel 5. This can be achieved by enabling satellite delivery.
9. Government is aware that research commissioned by the ITC has shown that satellite coverage from Astra reaches between 96% and 98% of UK homes ³. In fact, the practical experience of both Sky and the installation industry indicates that satellite service availability is at, or even exceeds, the upper limit found in the Rutherford study (99.5%) ⁴.
10. Thus, satellite is capable of being the mechanism for ensuring universal access to digital versions of the analogue public service channels. Consequently, from a coverage perspective there is no need to extend the DTT transmitter network beyond the current 80 sites. As the consultation

² Sky assumes that these obligations would apply to DSL also since DSL operators require local delivery (LDS) licences.

³ Rutherford Appleton Laboratory: "UK Satellite Coverage Prediction Study", June 2001.

⁴ Sky Sample, August 2000

document shows ⁵ this would avoid the need for further expenditure of £200m on DTT transmitters. Likewise, there is no need to set a 'DTT minimum reach' for the PSB services.

11. Sky is concerned that Government is not yet persuaded that the economically rational successor to analogue terrestrial is a mix of digital terrestrial, cable and satellite. Sky notes in this context Government's commitment to enabling competition between platforms ⁶ and that, consumers should have a choice of platform. Sky agrees that nothing should be done by Government to favour any particular platform becoming the official platform of choice for those who do not voluntarily migrate to digital. Such households will wish to continue receiving the existing analogue public service channels and are likely to be indifferent as to which platform they use to receive those services, particularly if the costs of receiving equipment are broadly comparable as between platforms. Sky continues to review the price of the satellite box and is willing to discuss with Government the options for migrating such people to digital television.

12. If Government considers that the best course involves favouring the DTT platform then Government must be fully aware of the costs and benefits of pursuing a policy which is not platform neutral. Sky acknowledges that Government intends to conduct a cost-benefit analysis as part of the Digital Television Action Plan ⁷ and agrees that Government should be aware of the cost of consumers having a choice of platform⁸.

14. In Sky's view the key elements of the proposed cost-benefit analysis must be:
 - the gains in terms of economic efficiency from the re-use of cleared spectrum;
 - the gains in terms of efficiency from digital television transmission;
 - the gains in terms of efficiency from the delivery of Government e-services via digital television;
 - the gains in terms of consumer welfare from the additional choice, etc. available via digital television;
 - the costs to consumers who are unwilling or unable to switch to digital TV of obtaining digital television receiving equipment (antennae, set-top boxes, idTVs); and
 - the cost to consumers of the incremental BBC licence fee required to fund new BBC digital services.

⁵ Consultation document, para 3.2

⁶ Consultation Document, para 1.12

⁷ Digital Television Action Plan, item 2.4.

⁸ Consultation Document, para 3.7.

15. Additionally, if Government wishes to emphasise digital terrestrial coverage as the successor to analogue terrestrial it must assess the following:

- the loss in terms of economic efficiency from the reduced spectrum available for re-use (as a consequence of using more spectrum to achieve universal coverage);
- the incremental digital terrestrial transmitter costs (relative to the cost of satellite, cable or DSL transmission);
- the incremental costs to consumers of acquiring receiving DTT equipment (relative to other reception means);
- the incremental loss in terms of consumer welfare resulting from restricted accessibility (as a result of DTT capacity constraints) to Government e-services, interactivity, etc.; and
- the incremental loss in terms of consumer welfare arising from less choice of FTA services and digital radio services (compared to what is available on other platforms)⁹.

16. Sky recognises that the question of the value of cleared spectrum in alternative uses is not easy to assess in the absence of a digital terrestrial spectrum plan which will identify how many, and which, frequency channels will be cleared. However, as the consultation paper notes the ITC's Genesis Report has identified a number of possibilities. Sky considers that this could provide the basis for analysing the benefits of spectrum use. As part of this analysis Sky believes that Government should (if it has not already done so) discuss with potential users whether there is a latent demand for such spectrum. In Sky's view a cost benefit analysis which ignores this will be misleading and meaningless.

17. More generally, Sky is concerned that Government might seek to reach decisions on spectrum planning ¹⁰ before the findings of that cost-benefit analysis can be assimilated. Sky considers that Government must be fully appraised of the costs and benefits of all the options which are available before it reaches decisions on digital terrestrial spectrum.

Measures to Improve Satellite Availability

⁹ Although consumers may be interested in only the PSB channels, they are likely to make some use of the additional services which are available.

¹⁰ and to implement a number of measures under the Digital Television Action Plan.

18. Landlord restrictions and planning regulations operate to constrain the availability of satellite as an option for consumers choosing digital television. These are obstacles which Government can remove and Sky urges Government to do so as a matter of urgency.
19. For example, consistently with Government's desire for consumers to have a choice of platform, Government should encourage the installation of an integrated reception system (IRS) in multiple occupancy residential developments. This would also extend the reach of DTT (which, currently, will not be capable of being received through the vast majority of existing TV aerial networks in apartment buildings), as well as satellite.
20. Where landlords impose restrictions for perceived aesthetic or environmental reasons, the approach described above would overcome such concerns. Sky, therefore, urges Government to adopt policies such that, unless they take steps to install IRS systems, landlords should not be allowed in relation to both new and existing buildings to prohibit the installation of TV antennae (whether terrestrial or satellite).
21. Other restrictions stem from planning regulations. In Sky's view, these regulations are seriously outdated and ignore totally advances in satellite dish technology which have reduced the size of the dish. Sky would argue that, in many cases, satellite dishes are now environmentally and architecturally more sympathetic than terrestrial aerials.
22. Sky urges Government to consult (and to encourage the devolved authorities to do likewise) on changes to the current planning regulations and to reach conclusions before deciding on its spectrum planning principles. Any hesitancy in so doing will only slow down the migration to digital - and could lead to conclusions on spectrum planning which are likely to represent an inefficient outcome. Insofar as the existing planning rules increase reliance on digital terrestrial television as the migration path, Sky considers that Government must be very aware of the costs and benefits of its inactions ¹¹.
23. Given that universal coverage of satellite is available, once these restrictions are removed Sky considers that there is no reason to extend DTT coverage beyond that provided by the existing 80 transmitters. Indeed, Sky believes that it is

¹¹ Sky considers that Government is under some compulsion to remove both landlord and planning restrictions in the light of the EC Communication on the Application of the General Principles of Free Movement of Goods and Services concerning the Use of Satellite Dishes, July 2001.

economically and commercially irrational to do so. It would simply create redundancy in digital terrestrial coverage.

Proposals for Spectrum Planning

26. Given Government's target that 99.4% of homes should be able to receive digital versions of BBC 1 and 2, ITV, Channel 4/S4C and Channel 5 and the ubiquity of satellite coverage Sky sees no need for spectrum to be planned so that digital terrestrial coverage is increased. In other words, digital terrestrial coverage should remain at 90% of homes based on 80 transmitter sites. It is self-evident from the consultation document ¹² that the extension of the DTT transmitter network involves very significant costs for rapidly diminishing extra coverage.
27. Sky notes that Government attaches some significance to digital terrestrial television as the means of providing digital reception to portable sets, sets with set-top aerials and second and subsequent sets in the home. Sky would remind Government that other solutions to multiple in-home TV sets such as 'TV Link' ¹³, already exist -and cost effective wireless digital in-home networking solutions, that can be used with any platform, are likely to become available in the near term due in large part to developments already taking place within the PC industry in response to consumer demand. Consequently, Sky suggests that Government does not give emphasis to the need to deliver digital services to portable sets in its spectrum planning principles.
28. Even if Government is not persuaded by the arguments above then Sky suggests that DTT spectrum planning policy should be driven solely by the need to enhance DTT coverage for the existing analogue PSB channels, rather than any initiative to extend the reach of the entire DTT platform. Sky believes that this could be best facilitated by re-arranging the existing DTT multiplex arrangements such that a single multiplex carries BBC1, BBC2, ITV, C4/S4C and Channel 5 and that the transmitter network is replanned such that only this multiplex has its coverage enhanced. Consideration should also be given to the use of a single frequency network to achieve this objective which could provide enhanced coverage whilst at the same time allow more, rather than less, spectrum to be released for other purposes.
29. Beyond that Sky considers that the status quo should prevail. Sky believes that free-to-view services are unlikely

¹² Consultation Document, paras 3.2 and 3.4

¹³ TV Link is a low cost system that allows satellite receivers to be connected to two or more TV sets and for full remote control of the satellite receiver's operation to be available at each TV set location.

to be significant drivers of digital television ¹⁴ and, hence, allocating more capacity to public service channels ¹⁵ is likely to be inefficient and wasteful.

30. Sky would argue also that it would be inappropriate for Government now to give additional multiplex capacity to commercial DTT operators. As Government recognises ¹⁶ this would be at the cost of alternative uses of the spectrum and may be inefficient.
31. More fundamentally, however, Government will be aware that the estimated coverage of the commercial DTT multiplexes was between 69% (licence D) and 90% (licence A) when the licences were advertised by the ITC. Accordingly, the scope of commercial DTT was defined; and in the light of that, Sky made its substantial investment in digital satellite. Sky has, therefore, a legitimate expectation that commercial DTT coverage and capacity will not be extended beyond that made available at the time multiplex licences were advertised. Government's spectrum planning must not undermine that legitimate expectation.
32. Additionally, Sky questions why Government proposes that "the four multiplexes carrying predominately pay TV services should be allocated sufficient spectrum to support coverage of 90% of households, but that the level of coverage should be a matter for the commercial judgement for the operators" ¹⁷. Such spectrum is a scarce resource and, in Sky's view, it is contrary to the pursuit of economic efficiency if such operators are allowed to warehouse the resource. Moreover, this would create additional uncertainty for the investment planning for competing platform operators, who would potentially be under perpetual doubt about whether this capacity would be exploited.

¹⁴ Sky notes also that the existing analogue channels, other than the BBC, have limited incentive to promote digital television.

¹⁵ Consultation Document, para 2.6

¹⁶ *ibid*

¹⁷ Consultation Document, para 3.9

**DIGITAL TELEVISION : SPECTRUM PLANNING CONSULTATION
QUESTIONS FOR ANSWER
RESPONSE BY BSKYB**

Q1. Our working assumption is that planning will continue for six multiplexes, as today. However we would also be interested in views on the costs and benefits of a more radical re-planning. This could be either reducing or increasing the number of multiplexes by one. Do you have views on this?

Sky agrees that a more radical re-planning exercise should be undertaken to assess the opportunity cost of the existing multiplexes versus the benefits they bring to the public and to the Exchequer. The use of a single multiplex to deliver all current public service broadcasts is, in principle, a good way of maximising public service broadcast availability over DTT, but will not be necessary if the combined coverage of digital terrestrial, cable and satellite is taken into account.

Q2. What do you see as the costs and the benefits of maintaining the current basis for network configuration compared with those for adopting a configuration using fewer frequency channels?

Planning for closure of terrestrial analogue broadcasts provides an opportunity which may not occur again for decades to re-visit many of the assumptions made during previous analyses and decisions, particularly where there are now technological advances which will aid efficient use of spectrum. For example the current modulation method for DTT (COFDM 2k) was chosen on the basis of availability of silicon at the time. COFDM 8k can now be considered which would offer the possibility to run single frequency network (SFN) configuration on some or all multiplexes with consequent improved spectrum efficiency. Such a decision would have an impact on the existing base of DTT receiver equipment as well as the modulators already deployed and Government will have to address whether this is manageable and worthwhile. Use of COFDM 8k would also make the broadcasts more resilient to interference and more consistent with standards used elsewhere in Europe.

Q3. Do you agree that we should continue to plan on an interleaved basis to support regional services?

There is clearly public demand for some regionally-oriented programming and services and due account should be made of such demand and the spectrum cost of meeting this demand. If this demand is in some way met, continuation of regional broadcasting on DTT will lead to an ongoing need for planning on an interleaved basis for at least one multiplex. However if COFDM 8k is introduced (see answer to Q2) the amount of interleaved

planning and broadcasting could be drastically reduced, freeing up a significant quantity of spectrum.

Q4: To what extent should the future planning of this spectrum take account of the provision of local services?

Local services are popular in some communities and the same considerations should apply as in the answer to Q3.

Q5. What factors would have to be taken into account in order to plan to support mobile broadcasting services?

Realistic assessment of need, market demand, opportunity cost of the spectrum and benefits from such use.

Q6. Does this analysis of coverage potential and associated costs adequately inform those taking decisions about the level of coverage by terrestrial means that should be required for public service broadcasters?

Analysis of coverage potential which takes full account of a combination of terrestrial and satellite coverage will provide the best opportunity for an efficient solution to the problem of continued access to the existing analogue PSB channels after analogue terrestrial closure. Terrestrial spectrum is a scarce resource; the use of which is not maximised when applied to broadcasting. As such its allocation to broadcasting should only be made in the light of clearly identified benefits which outweigh the costs.

Q7. Our working assumption is that the public service broadcasters should be required to reach a certain minimum percentage of households by the terrestrial platform. However, we would like your views on whether it is right to require a minimum, what that might be and the associated costs and benefits?

Sky's view is that any targets for public service coverage should be set in terms of reception via any available medium which is acceptable to the consumer. Reception targets should not be constrained to "the terrestrial platform".

Q8. Do you agree that the level of coverage provided by the networks supporting the four multiplexes carrying predominantly pay-tv services should be left to the commercial judgement of the operators?

Sky believes that it would be inefficient to plan for spectrum allocation where there is no obligation for the allocation to be utilised.

Q9. Which channels are cleared will depend on the costs and benefits of different replanning options. For example clearing 5 channels at the top and bottom of the frequency range is less disruptive to consumers and has lower switching costs than clearing ten at the top end. The benefits, though, will depend on the use to which such freed up spectrum can be put. We would like your views on the costs and benefits of different options.

Sky would argue again, as previously mentioned at Q2, that terrestrial analogue closure is a once in a lifetime opportunity to take a fresh look at UHF spectrum allocation with a view to

maximising efficiency of the bandwidth used for terrestrial TV broadcasting.

Q10. Which frequency channels should we clear?

The demand for and value of cleared spectrum is not clear at this time and the flexibility to re-allocate spectrum at either end of the UHF band should be retained. However, the impact on the cost of aerial upgrades should be allowed for on account of the grouping characteristic of many aerials in the installed base.

DIGITAL TELEVISION : THE PRINCIPLES FOR SPECTRUM PLANNING
Supplementary Comments by BSkyB

1. The comments below relate to the relevant paragraph in the consultation document.
2. para 1.2: The document gives a single example of a potential use for cost savings from switch-off of analogue transmission - that they could go into "higher quality programming" - whereas many, particularly in the broadcast community, feel that too much has already been spent in supporting the new BBC digital services which were introduced at TV licence payer expense in a bid to try to make switching over to digital reception more attractive. When savings from transmission efficiency after terrestrial analogue closure are available, a licence fee reduction to redress the balance to licence payers may be a more appropriate use of the savings rather than another increase in spending on programmes which may further distort the broadcasting environment.
3. para 1.7: Sky understands that since the C5 re-tuning exercise, a significant number of new VCRs sold have their modulator output factory set to channel 60. Prior to this exercise, the channel range of RF modulators was often 32 to 42; consequently, there are many units still in the area of 36 to 38. Also, Sky's understanding is that ITV digital STBs are set to channel 21 as a factory default (whereas Sky's STBs are set to channel 68). One or more of these STB / VCR generated frequencies are often distributed internally around the household. Safeguards and provisions should be built-in to spectrum re-use plans to support viewers in re-configuring their equipment in the case of interference from new services. The promotion of suitable products which isolate the received signal at the antenna from the local distribution would help in allowing local re-use of UHF spectrum.
4. para 1.15.1: Terrestrial aerial issues are not limited to "old or poorly adjusted". It is Sky's understanding that there are other significant issues with the aerial type (group and gain) and aerial location (because of susceptibility to interference). Hence, viewers who have recently had an aerial correctly installed for analogue terrestrial reception may still need to replace or re-site it in order to secure digital terrestrial reception, where coverage is available. This will add significantly to the cost of switching to digital terrestrial.

5. para 1.15.2: The consultation states that "terrestrial customers should find that digital reception on portable sets using a set-top aerial should be at least as good as for current analogue reception if the digital services can make use of the converted analogue frequencies". This statement would encourage viewers to obtain individual set-top converters or new digital portable TVs (if/when such items become available) whereas the principles for analogue and digital reception are different and they may not work reliably. The 'TV Link' option already provides a solution for digital satellite viewing by means of a simple and inexpensive upgrade.
6. para 1.15.3: Satellite customers are not faced with a "choice of specialist cabling" to "distribute the signal to additional [TV] sets, with each [TV] set requiring its own set top box...." Sky installers are very familiar with the cabling required to provide service to additional TV sets around the home and ordinary cable types can be used with a single STB able to be controlled from multiple locations via 'TV Link'.
7. para 1.15.4: The "conversion of VCRs" is not necessary for digital satellite viewers because all new VCRs have SCART connectors and are therefore capable of making good quality recordings of programmes. Additionally, the Sky STB has the capability to control compatible VCRs by means of pin 8 control functionality which simplifies considerably the task of advance programming a recording. Furthermore, advances in STB technology are persuading consumers to switch to more advanced types of recording equipment (for example, the Sky plus product) which have the built-in capability to record one programme while a viewer watches another.
8. para 2.3: Sky questions the assertion that extra "free-to-view public services" (paid for out of licence fees) beyond the current five services distributed in analogue, will be a "key driver in the take-up of digital television", when their contribution so far in this respect has been very small in comparison to those seeking to subscribe to pay TV.
9. para 2.7: Sky infers from the text that there will be a period of time when up to 20% of viewers will potentially have no access to digital terrestrial signals at analogue terrestrial switch-off. Sky believes viewers should be provided with options for continuity of service.
10. para 3.2: It is important to note when reviewing the cost of converting analogue terrestrial transmitters in the context of homes potentially served, that approaching half of UK homes already receive digital television broadcasts.

11. para 3.3: Refer to section 1.15.2 for comments.

12. para 3.5: As mentioned at 7 above, the "Sky plus" box allows viewing / playback while recording, and can also be controlled from other locations in the household via TV Link. Products such as this will become more widely available in the coming years and will make the digital satellite service even more convenient and efficient.

13. para 4.2: It should be noted that whereas terrestrial reception of the correct regional broadcast is subject to local terrain, no such restrictions apply to regionally controlled broadcasts on digital satellite.