

DIGITAL TELEVISION: THE PRINCIPLES FOR SPECTRUM PLANNING

RESPONSE OF CHANNEL 4 TO THE CONSULTATION PAPER

Channel 4 welcomes this consultation on spectrum planning and is pleased that detailed work is now being undertaken on the ways in which digital switchover will be achieved. Such work will greatly help the forward planning of all broadcasters, as investment and business plans are increasingly dependent on resolving the spectrum planning issues set out in this paper. As Channel 4 has argued before, greater clarity about the digital destination and the route to be taken to it will encourage more travellers to embark enthusiastically on the next stages of the journey.

But Channel 4 is concerned that recent developments – specifically doubts about the future of ITV Digital and the Cave report on Spectrum Management – make the future less certain and impede the channel's ability to plan ahead with confidence or to make a confident input into the present consultation.

Channel 4 has already made a considerable investment in digital television generally – through our high profile digital channels E4 and FilmFour - and in digital terrestrial television in particular, through our roll-out with ITV of the Digital 3 and 4 network. The channel is planning to invest £80 million in E4 and £66 million in FilmFour, and has committed £120 million (£10 million per year over 12 years) to Digital 3and4, in addition to the costs of its analogue transmission.

It has been government policy to encourage Channel 4 and other broadcasters to make such investments in DTT and digital services. The 1997 decision to end the funding formula, under which Channel 4 had had to make payments of almost £90 million each year to ITV, was clearly linked to the channel's investment in DTT infrastructure and content. The BBC licence fee has been increased considerably to help fund its digital investments (and unlike ITV and Channel 4, the BBC has had the advantage of being able to retain the proceeds from the sale of its transmitter network). ITV is awarded a 'digital dividend' linked to digital take-up, which has been estimated at no less than £500 million to date. These financial arrangements have enabled the industry to spend nearly £2billion so far on DTT and their digital services.

Channel 4's desire to invest further in the infrastructure to deliver digital terrestrial television will be conditioned by the strength of the government's commitment (and that of the rest of the industry) to the future of the platform and the financial costs involved in investing in it. But because Channel 4 is commercially funded, it needs to evaluate its digital investments on a commercial basis; this becomes increasingly difficult the higher the level of uncertainty about the future of DTT and hence of the prospects for analogue switch off.

Channel 4 has been actively involved in preparing the response of The Digital Network (TDN) to the consultation paper and believes it represents the consensus view of those broadcasters involved in DTT.

The present context

Channel 4 wants to see a vibrant digital terrestrial platform, and wishes to play its part in helping the Digital Action Plan be implemented. The channel recognises that this is likely to be made more difficult if ITV Digital were to close and there was no pay element or only a reduced pay-TV element within the platform.

But even greater uncertainty is raised by the Cave report's recommendations for spectrum pricing. The Cave proposals would mean levying a charge on the channel that would have a direct effect on its programme budget and harm its ability to invest further in digital transmission networks. At the same time, Cave's objective – more efficient use of spectrum – would not be brought any closer, as Channel 4 has no direct influence on how much spectrum it uses. Channel 4 is allocated spectrum by the spectrum planners, and is obliged to deliver a service to the whole of the UK (outside Wales). The channel has no freedom of manoeuvre to reduce the burden of a spectrum charge by using less spectrum.

Furthermore, the Cave report's suggestion that charging for analogue spectrum will give broadcasters an incentive to speed the pace of switchover to digital is wholly misplaced. Such charges would take money away from investment in digital, thereby slowing rather than encouraging digital. And they would exert no leverage on the people who will take the most important decisions about the switch to digital – the consumers who need to buy digital receivers and the government, which will make the decision about the timing of switchover.

Cave's suggestion that DTT multiplex holders should pay a spectrum price from the date of the renewal of their licences in 2009 or 2010 would also have the effect of slowing up the drive towards digital. If multiplex holders have to pay for their licences, then that will leave them with less money to spend on transmission networks or the services that are likely to drive digital take-up. The measure that would do most to encourage DTT investment would be an early commitment to renewing the multiplex licences for their second 12 year terms at nil cost, combined with an undertaking to offer the licence holders the option of a third term of equal length. Such an undertaking would provide the long-term stability that could underpin further investment in the digital network.

Channel 4 will be responding in full to the Cave report. But at this stage it is clear that unless and until the report's ill-thought-out proposals for pricing the broadcast spectrum are rejected, they will act as a serious deterrent to future investment in DTT. Channel 4, like other broadcasters, requires a degree of certainty about what tomorrow holds in order to commit resources today.

Principles of Spectrum Planning

Channel 4 is concerned that sufficient spectrum be available in future to allow both widespread coverage at a reasonable cost – and for there to be enough ‘elbow room’ for digital television to grow in the future. Channel 4 is already experiencing constraints on its ability to deliver the digital services to which it is currently committed. A redrawing of the spectrum map that seeks to maximise the amount of spectrum to be released for other purposes can limit the future vitality and even viability of the digital terrestrial platform.

The answers to several of the questions within the consultation paper are dependent on the decisions that are reached on others. The required coverage for the terrestrial network can be delivered by a certain number of transmitters - but the maximum power allowed at each transmitter site will depend on the available spectrum. Thus the coverage from each site will depend on the amount of released spectrum and this will in turn affect the total coverage available for a fixed number of sites. Each of these variables will influence the investments that broadcasters will be expected to make.

Decisions need to be taken on the coverage required of both free to view and pay services and the amount of spectrum that will be available to implement the planned coverage. There also needs to be an agreed plan about the levels of coverage that need to be achieved prior to switchover and about exactly how switchover will take place. And the plan for switchover itself needs to be agreed well in advance. Only then can broadcasters plan ahead in the knowledge of what road they are on.

Channel 4 believes that the plan for transition to switchover needs to be developed with the protection of commercial income in mind. It would be disastrous if commercially-funded broadcasters were to develop at considerable cost the digital transmission infrastructure - only to find they could not achieve the savings from switching off the duplicate analogue system because of the revenue loss which might arise from consumers able to receive the digital signal having not actually obtained or returned the necessary equipment.

Channel 4 believes the transition plan should be carried out on a region by region basis using existing DTT sites, along the following lines. At each main site and at each of its dependent transmitters the equipment necessary to deliver the new service at up to final power levels would need to be installed. Then the analogue BBC 2 transmitter would be turned off at the main site and this frequency converted to carry the BBC multiplex signal. This signal would then be turned on at the dependent transmitters (assuming they are radio fed). When the take up of DTT equipment is judged to have reached acceptable levels, the analogue BBC 1 service should be converted to carry the Digital 3and4 service. Turning off ITV, Channel 4 and Channel 5 analogue services would then follow over a period.

Clearly there needs to be a lot of detailed planning to develop this scenario into a workable plan. Such an approach is likely to be an iterative process, as there may well be power and frequency changes to be carried out at both main sites and dependent transmitters as the final network comes together. But Channel 4 believes such a scenario could form the basis of an effective switchover plan to which commercially funded broadcasters could agree.

Responses to the Consultation Paper's Questions

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?

The government's aim is "for the UK to have the most dynamic and competitive market for digital television in the G7" (para 1.3). To achieve this aim, the digital terrestrial platform has to have the capacity to fulfil everything that is required of it at present and to expand in the future. But currently broadcasters are finding it difficult to do everything that is expected and required of them within the available bandwidth. Relatively straightforward developments, such as the more effective Electronic Programme Guide (EPG) for the DTT platform advocated by the Viewers' Panel, will require extra bandwidth. If there is no room for expansion, then the ability of the platform to adapt to new challenges and to adopt new (as yet unknown) technologies will be extremely limited.

Channel 4 has a number of demands placed on it, all of which consume bandwidth available to it:

- The channel is required to simulcast its main service on the digital platform.
- New digital channels have been launched, at the behest of government (when it abolished the funding formula in 1997). Subscription film channel FilmFour and entertainment-based channel E4 are already established. The joint-venture *attheraces* channel is about to be launched, with an option to occupy the hours that FilmFour is not on air.
- Channel 4 is busy developing the new interactivity technology for use on its digital channels, where it can help both enhance viewers' enjoyment of programmes and contribute to advertising revenues.
- The channel has an obligation to deliver good picture quality on all its services. The technology used for digital services delivers variable and limited quality dependent on picture content. Consumer take-up of new display technologies such as plasma, projection TVs and thin film transistors will demonstrate current limitations more clearly than cathode ray tube displays, and may lead to future consumer demands for enhanced quality that will require additional spectrum.
- Channel 4 has statutory responsibilities to deliver audio-description and signing services that will increase in the years ahead.

Each of these activities requires bandwidth, and it is questionable whether all can be delivered fully within the present constraints of the Digital 3and4 multiplex.

Furthermore, Channel 4 is already providing services on other platforms (such as the further three FilmFour channels and increased interactivity available on digital satellite) that cannot be provided on DTT. Channel 4 is confident that it will be able to develop new services of value to viewers in the years ahead – but the channel's ability to make them available to DTT viewers (without dropping existing services) will be nil if the channel has to continue to function within existing bandwidth constraints.

If DTT is to maintain a pay element, then Channel 4 believes there are good arguments for it to obtain more multiplex capacity. This would enable the channel to move some of its pay services on to a multiplex with reach commensurate with other pay channels and thereby free up capacity on Digital 3and4. The channel could either lease multiplex capacity from another licensee or be allowed to operate some or all of any new multiplex that became available. However, any firm decision by the channel on taking up such new capacity would depend on certainty about the future of the pay element of the platform, and about the possibility or extent of any spectrum charges. Channel 4 could not plan for increased investment in the DTT platform while the current uncertainty continues.

Channel 4 has worked closely with ITV to develop the Digital 3and4 multiplex – believed to be the most complex multiplex in the world. Sharing a multiplex, coping with ITV's requirements for regionality, and providing obligatory space for teletext, inevitably involves more technical difficulties than would sole ownership. The channel is committed to continuing Digital 3and4.

The suggestion that all the public service channels should be available on a single free-to-view multiplex (paragraph 2.3) should be rejected. Each of the public service broadcasters has been encouraged to develop new services in order to help roll-out digital television, and has invested heavily in them. Channel 4 is currently set to invest some £169 million in its non-simulcast digital channels over seven years. These services are making a valuable contribution to digital take-up and in time will help Channel 4 consolidate its appeal and purpose. To force all public service broadcasters onto one multiplex would be a serious reversal of government policy and would deprive the public service broadcasters of a major incentive to develop new services, to no apparent gain.

Channel 4 is sceptical whether switchover can be achieved in the sort of timescale outlined in paragraph 1.5. The complexity of the transmission plan, the number of sites involved, the need to negotiate international clearances, the availability of capital and the scarcity of transmission engineers are all factors likely to mean transition will take longer.

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?

Channel 4 does not believe it would be sensible to abandon the current basis for network configuration in favour of a 'greenfield' approach that may not deliver as great an improvement in spectrum efficiency as suggested in the paper. Such an approach would involve writing off hundreds of millions of pounds of investment that has already been made in DTT transmitters.

But more importantly it would involve much greater disruption for consumers than is likely under current plans. Those consumers who so far have been reluctant to adopt digital television will need to be persuaded of its merits over the years ahead. This is going to prove considerably more difficult if a large number of roof-top aerials are going to need to be redirected or replaced.

The Genesis II project commissioned by TDN demonstrates how it is possible to develop an interleaved system of spectrum planning by building on the present system.

Another major factor is the cost to the transmission providers of decommissioning transmitters no longer required. The costs of this (removing aerial masts, demolishing buildings, clearing sites before handing back to their owners) are considerable, and are likely to prove substantial under current switchover scenarios. Reconfiguring the network altogether, and therefore re-siting several and possibly many transmitters, would drive this cost even higher.

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

Regional broadcasting is an important part of the public service broadcasting mix. The BBC and in particular ITV have obligations to provide regional programming. Although Channel 4 does not split its programme signal, it needs to divide its signal during commercial breaks in order to earn advertising revenue efficiently. Therefore Channel 4 believes that broadcast spectrum should continue to be planned on the basis of regional services

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

Channel 4 believes that priority has to be given to defining and providing the spectrum needs of the main national multiplexes. Providing mini-muxes that can allow for the development of RSLs should be a subsidiary aim once that has been achieved.

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

Although the technology exists to deliver services effectively to mobile receivers, there is no proven commercial model at present that can deliver them. However, it is likely that such services will become commercially feasible in the course of the next few years.

Channel 4 believes that mobile services need to be seen as separate from broadcasting and planned separately. Planning spectrum provision for them should be secondary to setting out the plan for broadcasting as a whole.

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?

Channel 4 has already invested extensively in the Digital 3and4 transmitter network. As argued above, the current uncertainties about the Cave report and the future of the DTT platform rule out present expansion of the transmitter network. If the government wants to see expansion of the DTT network, then it will need to both remove some of these uncertainties and be clear how this investment is to be paid for.

Channel 4 does not believe that the financial figures outlined in the consultation paper adequately reflect the costs to broadcasters of extending the transmitter networks and carrying out analogue conversions. Most significantly, the figures represent estimates of the capital costs involved and do not take any account of the revenue costs of running and maintaining a larger (or smaller) transmitter network.

It is difficult to identify exact costs ahead of detailed planning work that specifies exactly how many transmitters need to be provided, using how many channels and what power levels, to reach how many households. On the other hand, there is a 'chicken and egg' aspect to this; until some broad assumptions are made, the detailed planning cannot be done.

Channel 4 broadly agrees that the **capital** cost of converting the existing 80 main transmitters to allow **one** multiplex to be broadcast in one ex-analogue frequency would be of the order of £50 million, and that the cost of providing 120 sites would be around £70 million. However, we believe the cost of converting 1100 sites would be between £165 million and £225 million, while the cost of converting 700 sites would be in the range of £125 million to £180 million.

The **revenue costs** to support this level of investment and run the network would increase with the number of transmitters. At present it costs Channel 4 around £10 million annually to half fund run the Digital 3and4 multiplex, using 80 transmitters. If the network comprised 120 transmitters, the annual running costs to Channel 4 would be of the order of £13 million. But for a 700 transmitter network, the costs would be comparable to the £21 million it currently costs Channel 4 to service its analogue network. The annual cost of paying for an 1100 strong transmitter network would most likely be above £25 million.

The figures in the consultation paper also fail to take account of the transitional costs of building the present DTT network in order firstly to achieve the high levels of coverage that may be necessary to make switchover politically and commercially feasible and then of moving the leading multiplexes into the vacated analogue frequencies. The greater the levels of DTT coverage required prior to switchover, the higher the levels of investment broadcasters will be expected to make, and increase the chances that a high proportion of this investment will need to be written off following switchover.

The conversion process is likely to take some years. During this time the current analogue broadcasters will be required to maintain the analogue service whilst 'ramping up' the digital service to the point where the analogue transmitters can be turned off. During this transitional period the *net* cost to the current analogue broadcasters will rise very significantly. This period could take six or even ten years.

The more spectrum that can be retained for DTT use, the fewer transmitters will be required for a specified level of coverage and thus the lower the cost of implementation for the broadcasters and the shorter the implementation period.

As far as coverage is concerned, the second phase of the Genesis II project suggests that post-switchover the three main multiplexes with 80 DTT transmitters would provide coverage of just over 94%. However, this coverage is not uniform across the United Kingdom; coverage in England would be 95.8%, but in Scotland only 89.7%, in Northern Ireland only 89.7% and in Wales a mere 78%.

More detailed work will have to be done in order to estimate levels of coverage achievable by any given number of transmitters. A broad guess at this stage would be that between 200 and 750 transmitters would be needed to get close to near-universal coverage. Coverage of slightly less than 99% could be achieved with around 700 transmitters, which would be close to analogue levels of coverage but still leave several tens of thousands of households not receiving a digital signal; only by fully duplicating the 1100 analogue transmitters could they be guaranteed to be reached.

The number of transmitters likely to be needed to deliver a specified level of coverage will become better known when the results of the higher power trials currently underway at two DTT sites are known, and when the new UK planning model is verified and in use.

Channel 4 is pleased that the consultation paper assumes that converting the present analogue frequencies to digital is the best way to maximise digital coverage.

As argued above, the time and cost involved in achieving switchover should not be underestimated. One way to reduce costs that Channel 4 is actively exploring at the moment is a re-arrangement of broadcaster/transmission company relationships. At present Channel 4 contracts solely with ntl to provide its transmission service, which ntl does either directly with those sites it owns or by contracting with Crown Castle for using its sites. Channel 4 is considering the merits of contracting directly with both ntl and Crown Castle to provide a service in respect of the sites owned by each. This could provide modest efficiencies in capital expenditure and in the time involved in carrying out conversions. Other broadcasters could have similar dual contracts. However, there may be competition concerns about one transmitter company being a monopoly provider from each of its sites, which would need to be considered before this change could be introduced.

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?

Channel 4 believes there are clear public advantages in providing digital terrestrial television on the same sort of near-universal basis as analogue is currently provided. It could make free-to-air services available to all, provide minimum disruption to consumers at the time of switchover, help resolve the problem of converting to digital second and subsequent sets, and not be dependent on proprietary technology or transmission systems based outside the UK. And if DTT is a truly national platform it will be more attractive commercially as well as in public service terms.

However, the costs of providing digital terrestrial on this sort of basis are expensive (as outlined above), and there are sharply increasing marginal costs in extending coverage to each last percentile of the population. At the same time there are alternative technologies that can provide television services that were not available when the analogue network was rolled out.

There are therefore considerable advantages in relying on digital satellite to provide services to those households not easily reached by DTT. But there are also actual and hidden costs. Firstly, there is likely to be consumer resistance to having to acquire a receiving dish rather than rely on a traditional aerial. Then there is the cost of receiving apparatus and Conditional Access charges; non-pay consumers may argue with some justification that they should not have to pay for these in order to replace an aerial that received a perfectly reasonable analogue signal; in which case they would need to be paid from another source. The costs of providing such equipment and charges (now several times higher than the £100 per dish indicated in the consultation paper) would presumably have to be offset against the proceeds that the government may obtain from the sale of any released spectrum. Channel 4 would not be willing to contribute towards funding such costs.

BSkyB claims that its signal has 99%+ reach across the UK. However, detailed planning would need to be carried out to discover which areas cannot receive it. The far north of Scotland, where the undulations of the terrain combined with the lower angle of incidence, is one area where satellite penetration is likely to be more limited. Such areas, although thinly populated and difficult to reach through a terrestrial network, may be ones where DTT is the only viable delivery platform. Such considerations will affect the extensiveness of a DTT network.

Channel 4 believes that there are clear public policy advantages to developing a national DTT network. But on purely commercial grounds it might be more economical to provide a more limited DTT network of 120+ sites, if digital satellite can provide access to television services to those households unable to receive the DTT signal. There would need to be a detailed discussion about the costs involved and how they would be borne, before Channel 4 was prepared to commit to a near-universal DTT network. Even within such a network there would probably be a number of households which currently receive a terrestrial signal that would be outside the coverage area and able to receive neither satellite or cable instead.

Channel 4 does not believe it can commit to any extension of its transmitter network until the issues regarding the Cave report and the extension of the Digital 3and4 licence outlined earlier in this response are resolved.

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?

Channel 4 believes that it is in the interests of the DTT platform to offer as broad a service as possible (within the constraints outlined above). The more quality services that are available, the more people are likely to choose it and the more viable and commercially successful it is likely to be.

However, Channel 4 does not believe that the commercial judgements of the pay multiplex operators should be second-guessed. As an operator of pay-TV channels itself, Channel 4 understands the return on investment analysis that underpins consideration of extending DTT coverage of pay channels and believes such judgements should remain the responsibilities of the pay multiplex operators.

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.

See answer to Question 10.

Q10. Which frequency channels should we clear?

It has become the established view that digital switchover will allow for the release of a substantial amount of spectrum for other purposes. However, without detailed spectrum planning it is far from clear exactly how much spectrum it will be possible to release.

The question of how much spectrum could be released is very dependent on the coverage requirement, and cannot be fully answered until that is determined. Less available spectrum will imply more sites with attendant higher costs - the fewer channels that are available, the lower power per site (because of DTT on DTT interference), thus necessitating more transmitters in order to maintain any specified level of coverage.

Genesis II - based on clearing just two channels (35 and 37) while planning for six multiplexes using 80 transmitters and all of the rest of the currently available spectrum - would result in 94% coverage for the top three multiplexes. To both increase coverage and make use of fewer channels in the process would mean a considerable increase in transmitter numbers and costs.

Channel 4 believes that DTT needs room for expansion, and that, as part of this, consideration should be given to providing Channel 4 with greater multiplex capacity. This would require further spectrum. It is both sensible and more efficient for decisions to be taken about these issues now, so that planning can go ahead on this basis rather than allocating more capacity to broadcasting once the spectrum map has been drawn up.

Conclusion

Channel 4 was encouraged by the government to invest in digital terrestrial television, and has played a full part in rolling-out services that are attractive to viewers and in building a parallel transmission network. The channel wants to see a successful digital terrestrial platform, and hopes that it will continue to have a pay element to it. But without certainty and clarity about the future, it will not be sensible for Channel 4 to invest further in the digital terrestrial network.

Channel 4 believes the government must come to some firm conclusions about spectrum pricing and the future of the multiplex licences, about the level of spectrum release and about the future extent and viability of DTT. Does the government want to introduce spectrum pricing as advocated by Cave and thereby impose a financial burden and greater uncertainty on the industry? Does the government want to maximise the amount of spectrum to be released for other uses? Or does the government want to see a strong and viable digital terrestrial platform? Channel 4 believes that government cannot be fully in favour of all three and must choose where its priorities lie.

Channel Four Television Corporation

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