

**A REPORT TO THE CRTC ON DIGITAL TRANSITION
STRATEGIES IN A NUMBER OF DIFFERENT
COUNTRIES**

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Michael McEwen has prepared the original version of *A Report to the CRTC on Digital Transition Strategies in a Number of Different Countries* which has been translated by a third party.

Ce document est également disponible en français.

INTRODUCTION

This project was commissioned by the CRTC in July with the following mandate:

To Detail Broadcast Digital Transition (including HDTV) Regulations, Policies, and Experiences in a number of Countries Relevant to the Canadian Experience

Countries to Review: United States, Mexico, Australia, United Kingdom, France, and Germany (and any relevant EU Directives).

Questions to be investigated:

1. What are the current policies and regulations in place?
2. What are the issues surrounding these policies and regulations?
3. What is the future of over the air transmitted services in these countries?
4. What is the likelihood of fee for carriage of traditional over the air services by distributors?
5. The Implications for Canada and conclusions

The reader will note that most of the countries under review developed policy, which is rooted in moving analogue free over the air services to the digital platforms and preserving or enhancing existing business models. While some countries considered high definition television (HD) in their digital strategies most focused on moving the broadcast community from analogue to digital standard definition display and left HD as a secondary benefit subject to market place factors (particularly Europe). Over the last six to eight years, these initial strategies are being refined to include HD transmitted services.

Moving a ubiquitous public resource, as free over the air television is, from one platform (which will become redundant) to a new one with enhanced benefits is not an easy task. It is particularly difficult when citizens/viewers face redundancy of their current equipment, a cost to obtain new equipment

and are challenged with a lack of understanding about the most fundamental change in television since its beginning more than half a century ago.

Most broadcast policy and regulation is challenged with easing this transition first for the citizens of their countries and then the broadcasters licensed to serve them. The representative countries in this review all have specific industry histories, economic factors and cultural issues, which require strategies unique to their environment. However, there are many common characteristics to their strategies.

One of the characteristics of these individual strategic initiatives is that all have reasonably well defined legislative/regulatory frameworks with milestones and a projected end date to analogue transmission. All countries under review have set Analogue-Shut-Off (ASO) dates. There are typically three kinds of ASO dates:

- Target: an announced date based on estimates
- Firm: An agreed target set after intensive industry/government consultation usually accompanied by a timetable and strategy.
- Obligatory: an announced date by government and made obligatory by law

All the countries under consideration in this study have either firm or obligatory ASO dates. This seems to be a prerequisite for the creation of successful conditions for digital transition. Many of these same countries had targets in the early days of the digital transition, but in the light of experience have moved to firm or obligatory ASO dates.

As part of enhancing the existing business model for over the air television many countries saw multi channel multiplexes as a way to be more competitive with cable and satellite platforms. This is particularly true of Europe and to a lesser extent the US. Of course, in other circumstances the introduction of HDTV was seen to be the killer application. As these strategies play out it is fair to say that a combination of both strategies may well characterize a mature DTV transition.

Conventional broadcasters have been encouraged to provide enhanced services to go along with their digitization, including electronic program guides (EPG) and program related interactivity. However, pure data services or other related telecom services have not been a factor in financing the

broadcaster transition and are usually subject to the appropriate licenses and fees to the government.

Thus far, the digital benefit for broadcasters comes from enhanced quality and quantity along with revenue opportunities associated with these enhanced services. The broadcast community would argue that these revenue opportunities are less than the cost of the transition but none the less they are making the investments that will situate them firmly on digital platforms within the context of their own country's regulations.

In virtually all countries under review spectrum has been supplied at no cost to the broadcaster and in some cases digital licenses have been extended to give a period of stability to the broadcast business plan.

However, for the most part there has not been direct government subsidy to the broadcaster beyond the spectrum and the usual capital investment tax incentives. The government and the regulator tend to involve themselves in helping to create joint industry government initiatives for consumer education and the promotion of ASO and the new digital platforms. The UK best exemplifies this with a fund close to \$400 million dollars dedicated to moving its citizens to digital services. In this case funding sources include contributions by broadcasters, government and an increase in the BBC license fee dedicating to this activity.

It is interesting to note that aside from the UK and some Lander Media Authorities in Germany there has been little effort to mass market the digital transition or its benefits to the consumer. This situation resident in an industry that is perhaps the most pervasive of all media is an interesting paradox.

While public broadcasters have tended to embrace digital transmission and its potential, major commercial broadcasters have been less enthusiastic to make the investment, again often citing cost with little or no return as the reason. The inevitability of multiple digital platforms and increasingly fragmented markets is gradually changing this equation as well as growing consumer demands for service enhancements, choice, quality, and the format they want. Digital is the only way to exploit opportunities to deal with the challenges including the digitization of the core over the air broadcast service. The industry understands this and with the pressure of ASO before them, the industry is responding accordingly in the countries under review.

As the 1990s drew to a close there was a lot of hype about how fast digital take up would take place and it is probably fair to say that Analogue Shut Off targets were at best wishful thinking. On the other hand, almost a decade has passed since those early predictions and targets and with benefit of this hindsight, most countries involved with the conversion to digital from analogue have learned what it takes and are making changes (and some cases radical changes) to their transition strategies. This review will reflect this maturing strategy.

Given the preceding as context, this report will now look at the six countries under consideration with summarized policy and regulations, key discussion points, the viability of over the air broadcasting and fee for carriage. At the end of this review, the conclusion will focus on Canada and how it is doing with its “Market Place” approach as compared to the six countries under review.

AUSTRALIA

Australia announced its policy in 2000 and began implementing its transition strategy in 2001. Earlier this year it initiated a review and issued a policy update with a Firm ASO date.

The broadcast environment is very favourable to over the air broadcasters with only about 25 to 30% of Australian homes hooked up to cable (which only began in 1994) or satellite services and the over the air broadcasters enjoy strong brand recognition both nationally and within their regional and local communities. It is against this background that the Government’s Digital Policy sought to reinforce this situation and provide a stable framework for the transition.

Key Elements in Place Today:

1. ASO dates targeted for 2010 to 2012, currently over 85% of the population are within reach of a digital over the air signal.
2. Analogue channel duplicated in digital service in both Standard and High Definition display
3. HDTV a key feature of the Australian plan with each network obliged to provide 1040 hours of HD programming annually.
4. Additional channels contemplated for the future

5. Pay and Specialty Channels not part of the digital over the air offering and are yet to consider HD display on cable or satellite.
6. Over the air television is very robust
7. Proposal for joint government/industry association to aggressively promote the transition to consumers.

Policy, Regulation, and Related Issues:

The Policy, as summarized by the Australia Government's Department of Communications, Information Technology, and the Arts in 2000, is as noted below (subject to the author's edits):

- From 1 January 2001 in metropolitan areas and from specified dates before 1 January 2004 in regional areas, broadcasters were required to commence a digital standard definition television (SDTV) broadcast.
- Free-to-air television broadcasters (commercial and public broadcasters), are required to continue their existing analog broadcasts for at least eight years after the start date for digital services in their license/coverage areas. The duration of this simulcast period is to be reviewed by 2006.
- From 1 July 2003 or within two years of the start date for digital television services in each license/coverage area (whichever is the later), and in addition to their analog and SDTV transmissions, free-to-air television broadcasters will be required to provide 1040 hours per year of programs in high definition television (HDTV).
- Broadcasters are required by law to achieve the same level of reception coverage in SDTV format digital transmission as they were achieving with their analog transmissions, as soon as practicable after the start of the simulcast period. This must be completed by the end of the simulcast period.
- In recognition of the high conversion and operating costs of digital, broadcasters are being lent additional spectrum (7 MHz channels) for their digital transmissions. The broadcasters must return the spectrum currently used for their analog services at the end of the simulcast period.
- There is a moratorium on new commercial television licenses until the end of 2006.
- Commercial television broadcasters cannot multi-channel, except in very limited circumstances, such as when certain events including sports matches, extend over time due to circumstances beyond the broadcaster's control, and overlap with a regularly scheduled news program. This will allow viewers the option of continuing to watch the end of the event.
- The national (public) broadcasters (ABC and SBS) are allowed restricted multi-channels, with their additional channels able to show a range of programs including educational programs, regional news and current affairs, science and arts programs, children's programs and occasional dramas. The ABC and SBS may also transmit their radio services through their television channels, extending the reach of these services.
- Broadcasters are allowed to provide digital enhancements to their main simulcast programs, provided they are directly linked to, and contemporaneous, with the

main program. This could take the form of additional camera angles on a sports match, statistics about a player or additional information about a segment in a lifestyle or magazine program. Enhancements cannot amount to a separate multi-channel program.

- Broadcasters will be required to caption all prime time programs (6:00pm to 10:30pm), and all news and current affairs programs outside of prime time, with very limited exceptions.
- The above rules apply to free-to-air television services. Subscription television services are not subject to any requirements to convert to digital.
- Analogue shut off date targeted for December 31, 2008 for large Metropolitan areas

Additional spectrum and a moratorium on competition were considered benefits for the broadcast community and were designed to encourage the take up on transition. Indeed, even multi-channels were considered by the industry as increased fragmentation so the policy on these potential new services was very restrictive. At the same time broadcasters argued that HDTV was a prime motivator for digital take up and they would need all of their allotted 7MHz of spectrum for simultaneous digital SD and HD television releases.

The Australian regulator enforced a strong timetable for the roll out of digital services and today about 89% of Australians have access to digital over the air signals. However, the consumer has been slow to take up digital equipment. This is changing today and with the “home theatre” phenomenon taking hold viewers are finding that the over the air digital signals look good, particularly HD signals. About 17% of Australian households have over the air digital set top boxes (STBs) and somewhere between 10 to 20% of households have cable or satellite digital boxes. This means that approximately 30% of Australian households have access to a digital signal with probably less than half that getting the HDTV benefit.

The Australian Government undertook its promised review earlier this year and announced a New Media Framework for Australia in the middle of July. This new direction is designed to reinforce the original 1999 plan while setting conditions for Analogue Shut Off. While also dealing with increased Regulator authority, foreign and cross ownership, and other related industry issues the focus was very much on enhancing the digital experience for consumers and forcing the pace of the transition as noted in the announcement by the Minister of Communications, Information Technology, and Arts July 13th (subject to author’s edits);

- Develop a Digital Action Plan to drive the take-up of digital television services and help consumers make the transition from analogue services to the new digital environment;
- Open up two reserved digital channels for new digital services such as mobile television or new in-home services;
- Permit commercial free-to-air television stations to broadcast one standard definition multi-channel from 2009 (in addition to the simulcast of the analogue service), and to allow full multi-channels no later than the time of digital switchover.
- Permit a high definition multi-channel by removing the simulcast requirement (of the analogue channel/digital standard television channels) on high definition television programming;
- Remove the “genre” restrictions on the types of programming which can be shown on ABC and SBS multi-channels.

The specifics of some of the bullet points provide a concrete roadmap for both the conversion and consumer benefits:

Digital Action Plan

- Overseas developments, increasing digital uptake and the costs and inefficiencies of broadcasters running dual analogue and digital broadcasting services (simulcasting) mean that there is a strong imperative for Australia to move to a wholly digital television-broadcasting environment in line with the timeframes being adopted by other like countries.
- There is insufficient digital take-up to meet the current switchover date of 31 December 2008 in metropolitan areas (as noted in the original regulations).
- The Australian Government is therefore committed to the development of a Digital Action Plan (DAP) to proactively drive digital take-up, to bring the current simulcast period to an end and achieve switchover. Accordingly, this date will be reset with a new switchover target to commence in 2010-2012.
- The DAP will require careful planning and close collaboration and cooperation from all stakeholders. It will identify the major tasks, processes, and timeframes necessary to drive digital take-up and will consider whether a dedicated new body, such as the switchover organization created in the UK, will best facilitate the steps required to achieve switchover. The DAP is under development and will be released later in 2006.

This plan is likely to see a firm end dates to analogue services in the next 4 to 6 years and recognizes the need for a major consumer education and promotion plan. It is interesting to note that the policy speaks to nudging the market place along. Consistent with digital as providing more enhancements for consumers while preserving the core broadcast industry the new Media Plan provides for:

New Services on Spare Spectrum

- Consistent with encouraging the emergence of new and innovative digital services for consumers, the Government will allocate two unassigned digital channels throughout Australia for new digital services, rather than allocating this spectrum for a fourth commercial television network.
- Further detail on spectrum planning, marketing and legal aspects of the allocation or auction of these channels, together with the conditions attached to the licenses, is being considered by the Government and an announcement will be made as soon as possible in 2006.
- These channels have the potential to deliver a range of new and innovative services to consumers, which could include up to 30 channels under some uses, and would be an opportunity for industry to expand and respond to the challenges of the digital environment.

Again, choice continues to drive the transition plan update with multi-channel and HDTV changes:

Multi-channels

Commercial Free to Air Television

- legislate to enable commercial free to air television broadcasters to provide one standard definition (SDTV) multi-channel from 1 January 2009;
- legislate to permit broadcasters to run one HDTV multi-channel in advance of switchover, by removing the requirement that high definition television (HDTV) services must be a simulcast of analogue and standard definition digital television (SDTV) services from 1 January 2007;
- retain the current prohibition on full multi-channels by commercial broadcasters until the end of the simulcast period, subject to technical advances or unanticipated delays in achieving switchover, or other matters which may alter the balance in favour of an earlier adjustment;
- Consider arrangements for the regulation of commercial multi-channels prior to commencement.

Although the end of the simulcast period provides a natural point, from both a policy and practical perspective, for further changes to the digital television regulatory settings, the Government considers that there should be some new opportunities made available to broadcasters in the transition to a fully digital television broadcasting environment for those who wish to take up those opportunities.

While the Government recognizes there are a range of views relating to the benefits and impacts of multi-channels, the availability of some new digital services will provide more variety for consumers and further contribute to digital take-up.

Public Broadcasters (ABC and SBS):

- The restrictions on the types of programs permitted on national broadcaster multi-channels will be removed as soon as possible upon the passage of legislation.
- This will give the national broadcasters greater scope to experiment with new digital programming and services and make greater use of their valuable program archives. National broadcasters will thus be better able to serve their audiences and to provide additional attractive channels, which can contribute to digital uptake.

HDTV Quotas

- The current HDTV quota of at least 1040 programming hours per year will be retained until the end of the simulcast period. This is in recognition of the need to provide certainty for viewers and industry during the transition to digital but to provide that, after switchover, broadcasters will be permitted to choose how best to meet their audiences' needs and structure the use of their spectrum between SDTV, HDTV and multi-channels.

Finally, the market place remains stable with no new traditional over the air broadcaster licenses until the end of the transition period and then subject to government rather than regulator decision:

- The Government will not allocate new commercial television licenses within broadcasting services band (BSB) spectrum between the end of the moratorium on new licenses on 31 December 2006 and digital switchover. The allocation of new licenses will be reviewed in accordance with the Digital Action Plan prior to the end of the simulcast period.

To sum up the Australian situation to today the key policy issues have been to encourage the broadcasters to make the transition by restricting competition and providing spectrum. The broadcast and production communities have spent about one billion dollars to date in making the digital transition, including HD programming.

However, up to now the consumer has not been encouraged to take up digital over the air receiving equipment in an environment where cable is underdeveloped and multi channel services restricted. The new initiatives announced in the Media Plan are designed to break that logjam while still preserving a stable non-competitive environment for conventional over the air broadcasters.

The HDTV Benefit:

The requirement for each commercial and public network to supply 1040 hours of HD programming annually has done a great deal to create both an on screen benefit for viewers and a viable HD production element in the domestic production community. The five networks supply 5200 hours of HD programming a year, an average of 100 hours of domestic production in HD displayed on screens each week. The independent production community has supplied much of this product.

Over the last five years the industry has made the necessary infrastructure changes for HD delivery; creating on going shelf life for produced programs, competitive quality of domestic programs with procured foreign HD product and enhanced competitive benefit for Australian produced programs on the international market. In addition, many of the broadcasters have made HD investments for in studio production and editing. The independent production facility suppliers have made similar investments.

While this transition was certainly a challenge at the beginning, because HD production was a milestone in the transition plan all the industry players worked to realize the targets. The result is that most high quality and legacy product including; drama, variety, nature and high profile documentaries, specials, events, sports and even some studio based talk programming all enjoy HD production in Australia and the initial increased costs have now been amortized over time.

The Future of Over the Air Broadcast Services:

Australia has a very rich over the air media environment with three strong commercial networks, two public networks and several community based services, which supply a very broad and high quality range of programming much of it rooted in the communities and regions they serve.

At the same time cable/satellite services are expensive and in some areas unavailable. As noted earlier cable has only a little over a decade of experience in Australia and finds it expensive to build out to the large geography and widely spread population centers. Over the air broadcasting remains the cheapest and most efficient way of delivering services. It is neither politically feasible nor economic to deny viewers over the air service in favor of expensive satellite alternatives or the potential of cable build out (subscription TV is targeted at 50% over the mid term future).

Eventually TV viewing may be via fibre pipes or high capacity wireless but that is far away in the future. In the end this may be only viable in a few large Metropolitan areas where the population is such that broadcast services may be supported on other platforms than over the air. Australians are regionalized in their interests and value their local services whether in a State capital or in a sparsely populated community and will demand some form of universal delivery of these services and for the near future that is over the air.

In the recent government announcements multi channels and new TV-like services (mobile TV) will likely enhance the notion of free over the air services and help Australia broadcasters maintain their present strong and viable broadcast system.

Fee for Carriage:

Fee for carriage is subject to negotiation between the broadcaster and distributor and to date distributors have not been able to get agreement to carry all of the broadcast services. The fees paid tend to be “in kind services” rather than cash to the broadcasters bottom line. These services include costs of broadcaster feeds to distributor head ends. The broadcaster gets to claim fee for carriage and the distributor gets the rights to display the service.

Since cable/satellite distribution is still relatively new to Australia with only about a quarter of households subscribing, broadcasters are in an exceptionally strong position to withhold their signal for carriage and currently three networks are withholding their digital signals (including HD programming). Local analogue signals are carried by cable and national signals by satellite according to current regulation. Currently digital carriage is not subject to the same regulatory direction giving broadcasters a chance to demand payment for HD and other digital services, at very least to recover their costs of delivery to distributor head end.

There is recognition by broadcasters that they should be on all platforms both existing and new over the air ones like Mobile TV. Given the power of their brand, in the digital world the broadcasters should be able to access all platforms at a price while keeping their over the air signal for commercial leverage. Clearly had the development of distributed services happened

earlier in Australia the broadcast community would not have had such an opportunity, as they seem to have today.

Conclusion on Australia:

This report has spent considerable time on the Australia policy and regulatory process since it has undergone considerable evolution over the last 6 years and appears to be reacting appropriately to the market place conditions of both Australia and the experiences of other countries who have undertaken the digital transition. While no transition is without its flaws the experiences of Australia may have some useful resonance in Canada despite the differences in both the market and distribution infrastructure.

FRANCE

France began the planning for digital terrestrial transmission (DTT) in the late 1990s and this planning included extensive industry consultation and frequency planning. The French market has close to 25 million households broken out by viewing share:

- 39% viewing to Public Broadcasters
- 49% viewing to commercial broadcasters
- the remaining to pay channels

France has an extensive transmitter analogue system, which can serve as a basis for DTT infrastructure. Distributors provide some over the air pay analogue services as well as cable (33% pass-by) and two competing satellite pay services (national). There is about 36% penetration of French households of pay TV services but as noted above over the air services receive strong viewer support no matter the platform. It has been noted by commentators that the French market remains receptive to the additional benefits of multi channel DTT free to air services as well as DTT pay services.

Key Elements in Place Today:

1. ASO target date of 2012 subject to Regulator confirmation
2. Multi channel multiplex offering; 18 channels free to air available and ten pay services.

3. Digital coverage presently at about 65% of the country and projected to rise to 85% by 2007.
4. No HD available and none presently planned for immediate over the air distribution.
5. Robust over the air broadcast system in analogue and being enhanced by digital offering.

Policy, Regulation and Related Issues: (summarized from a study by the European Broadcast Union on digital transitions and analogue shut off dates in Europe)

- August 2000 France establishes DTT framework
- 2001/02/03 The French Regulator, Conseil Supérieur de l'Audiovisuel (CSA), tenders and selects licenses for DTT multiplexes. Broadcasters select multiplex operators (Transmission Companies) and CSA authorizations operators and allocate frequencies.
- Spectrum is available for all existing analogue licenses holders. Digital licenses for 10 years from operational commencement
- 2004 the Government confirms MPEG-2 technology for free to air services and MPEG-4 for pay DTT services (important distinction because an early decision will provide for easy launch of DTT receivers with the right technology available)
- 2005 Launch of free to air services
- September 2006 18 free to air services available six of which are simulcast analogue public and private networks and some are new services specific to the DTT offering. Regional services will be added to the appropriate multiplex(es) over time) to 65% of the population. Ten pay services are also available via DTT service.
- 2007 planned coverage to rise to 85%. It will be difficult to progress from this point since industry will resist the high infrastructure cost for the small population covered. Mobile and HDTV are also a potential offerings (yet to be decided) on a dedicated multiplex utilizing MPEG-4 technology
- March 31, 2010 planned Analogue Shut Off. This targeted date is subject to change by the CSA and observers speculate that it is likely to change because of market circumstances.

Digital television had a difficult and slow beginning in France with a small constituency (public broadcasters), outright opposition from private broadcasters, and political opposition from other entrenched interests.

However, the inevitability of the need to make the transition took hold with the regulator making commitments and politicians understanding the potential benefits to the French viewer/consumer. The experience of other jurisdictions, particularly the Freeview experience in the UK gave all the players a great deal of confidence in the transition plan. The push to make the 85% coverage target by 2007 is as much political as it is economic since the politicians would like it in place before the elections that year.

Even with a strong competitive DTH market and a far more modest cable market, most French households receive their service from over the air transmitters, which makes free to air DTT very attractive. In a year of operations, more than 2 million digital receivers were sold (this will dramatically increase with built in tuners coming to market), which confirms the attractive offering of more free services on the digital platform. The market is still in the early stages of growth and the impact of pay services on the digital terrestrial platform needs to be assessed.

This quick take up of digital services would seem to ensure the 2010 Analogue-Shut-Off date would be achievable but there is real concern about how to go the last 15% of coverage and discussions focusing on this issue have already begun. One is a terrestrial solution but would require a firm analogue shutdown to free up spectrum and the other would be a free DTH delivered digital service, which is opposed by some private interests with cross ownership issues. It is likely a terrestrial solution is the preferred option by the CSA and government but the process will be difficult and may not be resolved for a few years.

The viability of the new free to air digital only services will also be another area of future assessment. They will have to create new advertising revenues or take away revenue from existing players in an already highly competitive conventional market. While it would appear a quick take up of DTT would benefit them as coverage extends the transmission companies charge the broadcaster more for their spectrum on the multiplex.

These kinds of contradictions in establishing a quick roll out and firm analogue shut off provide an ongoing dynamic to any country's transition plan and need to be assessed on an on going basis. Public funding help for the "last mile" of digital transmission coverage is being discussed in France as well as other countries to create the conditions for ASO.

Finally, the transition plan encourages an industry/government organization to manage the issues, educate and promote DTT services.

HDTV in France:

From the beginning of their transition planning HD was not a factor in spectrum allocation or a considered benefit for consumers in making the switch to digital over the air service. The focus was on providing more services and efficient spectrum management. Largely, that focus remains intact today in France and most other European countries. Given their geography, population and the resultant scarce spectrum this should be no surprise to observers of European broadcast development.

However with the success of HD in North America, Japan, Korea and even in some European experiences, HD has become a bit of the “elephant in the room”. This has necessitated planners, broadcasters and transmission companies to consider HD. As noted earlier plans are being made to carry a modest amount of HD programming, utilizing MPEG-4 technology on future multiplex developments, beginning in 2007.

A more likely scenario for any volume of HD services will probably be satellite in both France and Europe because there simply is not enough terrestrial spectrum available for a substantial HD commitment, particularly if the current strategies of additional services continue to characterize the DTT offerings.

It is interesting to note that France has made a huge commitment to D-Cinema programming, which tends to use High Definition electronic production standards as defined by the International Telecommunications Union (the same standard used by producers of HD around the world). This product would certainly translate well to TV displays.

There is no question that HD will be part of France’s media landscape. It will likely be slow to start and serve niche markets for some years before developing a mass-market appeal, as observed in the United States. It is unlikely to be much of a factor in the roll out of digital over the air services in France.

The Future of Over the Air Broadcasting:

In short the future of over the air services in France is robust. With relatively low distributor penetration of cable/satellite services and new multiplexes offering a considerably enhanced over the air service this trend is expected to continue.

Pay services supplied over the air and via cable/satellite will continue to enjoy support and may even grow but not to the detriment of over the air broadcasting. The challenge to current conventional analogue broadcasters may be found in the additional free to air services in the digital offering. This kind of market fragmentation was resisted by the commercial broadcasters but now they are adjusting their strategies to occupy more of the bandwidth with new services and even contemplating moving some of their pay services to free offering.

France is a highly regulated structured market where public policy has encouraged over the air services central to their as central to their system. This policy inclination remains in the legislation and regulatory framework of the digital transition and is well accepted by the French consumer as evidenced by the strong market share of conventional broadcasters.

Fee for Carriage:

There is no sanctioned fee for service for conventional over the air channels. Fees are paid for thematic (specialty) channels as in North America. There is must carry for local services on cable and a negotiation for carriage on satellite or national services on local cable but broadcasters are not obliged to supply these services (and in some cases don't). However distributors usually choose to carry popular branded national conventional broadcasters and increasingly in the fragmented market broadcasters are seeking carriage on all platforms.

Fee for carriage of conventional broadcast services will not be a factor in the digital transition roll out.

Conclusions on France:

Most DTV homes in France come from DTH satellite service, with cable increasingly investing in infrastructure improvements and making a modest contribution to DTV households. However France is still a market with 65%

of household's analogue only. There is a considerable migration challenge and a short mandated period to make it.

However France is a European leader in IPTV with many service providers and a growing market. They also are a country that is distributing multi mode set top boxes (Sat/DTT and Sat/DSL) with both MPEG-2 and MPEG-4 platforms. This makes the tools friendly to the consumer and consistent with their existing market in the conventional world.

The initial take up of Digital terrestrial receivers, the strength of the conventional broadcast market, the well-defined roll out plan and rigorous regulatory framework should guarantee a successful transition even with "the last mile" issues.

GERMANY

Germany is the largest television market in Europe. It also has very few over the air viewers. Over 95% of Germany's 36 million TV households receive their primary reception from cable or satellite. Less than 5% rely on terrestrial signals and even factoring in second household TV sets that figure rises only to about 12%. In the analogue world, this terrestrial reach continues to shrink because of lack of choice (no private broadcasters are currently broadcasting an analogue signal leaving only public broadcasting on analogue).

The policy and regulatory environment is complicated to say the least with spectrum responsibility residing federally but media and content the responsibility of the Lander (provincial) states. Without getting bogged down in the intricacies of the process required to make policy and regulation for digital transition and ASO suffice to say that cooperative agreements, formal inter state treaties, industry/government transition/platform groups (both Federally and in each State) and a general framework provided by the Federal government has provided for a relatively straight forward transition. It should be noted that the committee work and consultation was prodigious to achieve the results to date.

Key Elements in Place Today:

1. ASO planned for 2010, likely to be earlier.

2. Current over the air digital coverage at 60% of German households
3. Up to 30 standard definition services on each multiplex, no pay services
4. No over the air HD offering and to date no plans for HD.
5. Viewing to over the air services (analogue and digital) less than 5%; cable and satellite delivery vehicles of consumer choice.
6. There has been some modest government subsidy to private broadcasters and consumers in the early part of the transition. The EC has ruled these illegal but authorities continue to try and find

Policy, Regulation, and Related Issues: (notes in part from a study by the European Broadcast Union on digital transitions and analogue shut off dates in Europe)

- 1998: Federal Government decision to switch from analogue to digital terrestrial signals with ASO set for 2010.
- The rationale included:
 1. Wider choice of channels
 2. Better reception quality
 3. Opportunities for improved portable and mobile reception
 4. Potential for new services and interactive services
 5. To open a creative alternative to cable in densely populated areas where satellite is often less effective
 6. Spectrum scarce and demands short simulcast periods and a phased launch of services.
 7. An intention that private and public broadcasters share a 50/50 status in the digital roll out and multiplex participation.
 8. That costs in the digital transmission should not be greater than those of analogue
 9. Standard definition will be the adopted standard for digital television on the basis of cost and early adoption; creating a competitive environment with cable and satellite
 10. Set Top Boxes should be affordable.
 11. ASO and switch-over should be achieved with little disruption
- 1999/2000; development and announcement of a launch plan using the “island by island” strategy, building multiplexes beginning in large urban environments and spreading out from these centers to less densely population areas and rural Germany. This approach differs full national or even full state launch.

- Licensing of spectrum is federal and the assignment of that spectrum for content is a Lander Media Authority responsibility. The network/transmission operator has little or no flexibility about how to allocate the licensed spectrum. Therefore the tendency has been to give all existing spectrum to current conventional broadcasting; private and public including conventional and thematic channels assuming they were analogue services.
- 2002/03; Launch of digital in Berlin Brandenburg and successful ASO in less than one year. Subsidies to private broadcasters and some viewers were challenged to the European Commission and were upheld but nonetheless the transition was a success with little viewer angst.
- 2003/06 Launch of DTT services in other German Lander on the “island to island” concept. Today there are no commercial broadcasters still broadcasting an analogue signal but there remains a great deal of the country yet to receive digital broadcasts and if the commercial broadcasters decide not to participate in these multiplexes (they are not obliged by law) the public services themselves may not been enough of a motivator for consumers to buy digital receivers.
- 2010 proposed full ASO. This may be possible sooner since everyone agrees there is no value in remaining with over the air analogue signals.

Today most urban centers have digital only terrestrial services but most of the bandwidth has been filled with conventional broadcast services leaving a challenge for future interactive services, mobile services, and HD. While the public broadcasters are still broadcasting in analogue/digital simulcast, they are challenged regarding the affordability of building out the digital terrestrial infrastructure without the private sector participating. This issue needs resolution to complete the transition. The notion of viewers losing analogue services after ASO is not pleasant for the German industry to contemplate.

Set-top boxes and digital receivers now exceed two and a half million and with eventual built in set tuners the potential to increase viewing to terrestrial systems is evident. Set-top box cost began at close to 200 euros but has dropped to the 50 euros range and likely will continue to drop to 20 or 25 euros over the next year or two.

There has been a very modest increase to terrestrial viewing since the DTT launch but cable and satellite is still omnipresent. All German households pay a license fee of 16 euros a month, and cable subscribers pay 12 to 15 euros a month giving those subscribers about 30 channels of choice (many of those subscribers pay the bill in their monthly apartment rentals). It is unlikely that satellite will lose substantial markets to over the air digital multiplexes. However, cable infrastructure is old and only capable of delivering about 30 channels at best. To the degree these terrestrial digital multiplexes can duplicate that choice, provide quality video and sound, and provide enhanced services, the viewer may come to see terrestrial digital TV as a better option than paying a cable distributor an extra 12 to 15 euros a month for the same service.

Today about 60% of German viewers can access digital signals and notwithstanding the previously noted challenges Germany is on track for complete ASO by 2010 and perhaps a year or two earlier. Generally viewers can access 24 free to air services provide by commercial and public broadcasters. Completing “the last mile” over the next few years will not be easy but it will be done. The question remains whether commercial broadcasters will be part of the remaining multiplexes up to 90 to 95% coverage.

HDTV in Germany:

In short, the future of over the air terrestrial HD does not look bright for Germany. There is simply not the spectrum at this stage to carry such services. Even after complete analogue shut off it is unlikely that there will be the bandwidth available to carry a meaningful amount of HD programming. This is particularly true when the priorities of mobile television, interactive services, and new services are competing for what scarce spectrum will be made available. These priorities are high on various Lander Media Authorities. The introduction of MPEG-4 technology may change this equation but it implies a next generation of transition to both tuners and displays.

HD on satellite is the most likely scenario as it is throughout Europe. Large conventional broadcasters and media companies will develop specific HD services for delivery. In theory they could produce their main terrestrial service in HD and down convert for terrestrial distribution, and then use the same signal for satellite. Many schemes may be considered but it is not a

high priority for German broadcasters today. Cable in Germany has done little to upgrade their analogue delivery to digital capacity (although this seems likely to change) and therefore does not have the capacity for HD delivery yet.

The German digital transition is based on choice not HD programming. When German HD becomes a reality it will be a Satellite delivered service in the first instance with other platforms as a secondary delivery mode; as capacity exists to handle the HD bandwidth requirements.

The Future of Over the Air Broadcasting:

Given the report on Germany to date it is obvious that over the air broadcasting in Germany has diminished almost to the point of irrelevance as a delivery mode. There are indications that digital broadcasting will improve the efficacy of these over the air signals to viewers because of increased channel choice at no charge. However, this is unlikely to change the reality that cable and satellite delivery will continue to provide services to 95% of the primary sets in German households. The brand of conventional broadcasters both private and public in the German system is still very strong and a cornerstone of cable and satellite delivered services.

The delivery of terrestrial signals by public broadcasters is an act of policy in the German Republic and there is no intention of abandoning this method of signal distribution to viewers. The commercial sector has been a full partner in digital multiplexes in large metropolitan areas. But, they have indicated a reluctance to be a partner in a full coverage plan encompassing less densely populated and rural areas. They are not required to do so by law. While the commercial sector will be pressured to be full partners on all multiplexes they seem unlikely to do so, and they will depend on existing satellite and cable delivery to reach their markets. The burden will fall to public broadcasters to ensure services are available to viewers all across the country.

It is probably fair to note that as modest as digital terrestrial transmission is in the general delivery of broadcast services to the viewer this initiative has the potential of future relevance for over the air delivered services in Germany. It will take time to see how the market adjusts to this new technology and potential new services choices and convergence enhancements.

Fee for Carriage:

While there is the full range of pay services, particularly on satellite there is not a regime for fee for carriage of conventional broadcast services. There is a complicated and somewhat convoluted series of must carry rules in the individual Lander as authorized by the media authorities. This ensures delivery of national and localized versions of national services to local viewers. These services are called free-to-air-TV and are the core of the cable service delivery and growing on satellite. Free-to-air in this case means paying a fee for delivery but not for the individual services.

The Pay TV market is a modest one in Germany compared with the rest of Europe, about 10% of the market. The conventional broadcast services want payment for carriage of their digital signal and the commercial broadcasters have actually tried to stop retransmission, but must carry rules tend to force carriage. This is an issue in discussion but, as yet, no resolution. The difficulty for the broadcaster is the reach of the distributor; the challenge for the distributor is they need the broadcast services for a competitive offering. The Media Authority wants the widest distribution of conventional services as part of the public service remit. And given the realities of the distribution system in Germany one can imagine that there will be a lot of on going disagreement amongst the industry interests.

Conclusion on Germany:

Digital switch over has worked well in Germany and was enormously aided by the natural advantage of Germany having a small terrestrial audience of less than 5%. Even so the planning, consultation, and phased approach has worked well. The transition has proceeded more quickly than expected with less consumer backlash and a higher than expected digital receiver uptake including second household sets.

Germany will likely achieve full ASO by an earlier date than 2010. However, challenges remain including whether commercial broadcasters will be a part of the rest of the digital build out to sparser population areas, bandwidth management, and availability for new and attractive services, and subsidies to address some of the transition costs of the participants.

MEXICO

Mexico published its digital transition plan in 2005 entitled the “Politica de Transicion a la Television Digital Terrestre en Mexico”. Mexico has a long transition strategy beginning this year and ending in 15 years, 2021. It is seen as a straight replacement technology for the existing services. It stresses HD as the primary consumer benefit and of course spectrum efficiency as the public benefit. This is a both an ambitious plan and cautious at the same time recognizing the realities of the economic and social needs of Mexicans and at the same time recognizing that the industry cannot fall behind their North American counterparts in distribution and production of HD programming. It is of note that Mexico is the largest exporter of Spanish language programming in the world and as wide screen HD markets open up they want to be there.

Key Elements in Place Today:

1. ASO projected for 2021 subject to Government confirmation
2. Planned services to begin phased in approach end of 2006.
3. HD the prime benefit to consumers with digital simulcast of analogue with 80% HD content (initially a lot of up-converted programming).
No multi channel offerings.
4. No pay digital over the air planned at this time. Cable carries 5 HD services, mostly foreign origination.
5. Over the air services enjoys the majority of Mexican viewing.
6. No subsidies and no cross industry association for promotion.

Policy, Regulation, and Related Issues:

- Adoption of the ATSC standard
- Assignment of a second channel for DTV services (simultaneous transmission of analogue & digital services)
- Establishes the launch date for the different cities according to the population and location. Beginning with 9 cities by the end of 2006(Mexico, Guadalajara, Monterrey and 6 located along the border)
- Defines a timetable for the introduction of DTV and names 2021 as the likely date to finish the transition. It is not the defined date for the end of the analog transmissions but a target subject to evaluation.

- Every broadcaster who commits to begin DTV transmission in accordance to the agreed timetable receives a license term until the year 2021.
- The broadcaster may begin DTV transmission based on low power operation (coverage 20% of the service area)
- The DTV plan will be reviewed every two years and the timetable may be modified according to a number of factors; penetration of DTV receivers, economics of the transition and the industry, and political realities surrounding the transition, etc.
- The plan provides convergence opportunities for the broadcaster, who may offer not only audio & video, but also data and interactivity into its allotted 6 MHz bandwidth.

This plan is the result of a great deal of industry consultation and discussion and the broadcasters have all signed off on the plan and agreed to work within its parameters. A faster roll out is permitted. If a broadcaster fails to live up to their agreed plan then their digital licenses may be cancelled.

Mexico is dominated by two private networks and their affiliated stations. There are a few small public broadcasters but they are little of consequence in moving the market to a digital platform. The transition plan calls for the public broadcasters to begin broadcasting digital services 3 years after the commercial networks begin their transmissions (2009).

The transition plan calls for introducing digital coverage in a phased manner and it will be 2012 before the main networks achieve 80% of the population, 2015 for secondary networks and 2021 before regional and local stations reach close to 100% penetration. It is clear the Mexicans want to protect their border markets by beginning digital transition in the 6 large border communities by the end of 2006.

The Government has not made the harvesting and subsequent auction or reallocation of analogue spectrum a key plank of the transition plan but spectrum recovery is one of the eventual results of the plan and has been noted for future reference.

Since the transition plan is over a long period of time the assumption being made is that Mexican consumers will be able to purchase affordable wide screen HD sets with the built in digital tuner. There is no plan, at this stage, to push set top boxes or to have a mass marketing promotion or campaign to

move the market to digital. This will evolve as the plan unfolds and will be subject to review and action as part of the regular two-year reviews.

While broadcasters can exploit all aspects of their spectrum for digital audiovisual enhancements and program related material like an EPG, pure data delivery of a non-program nature requires a license and a fee to government, and there is no subscription services planned for the bandwidth. Traditional advertising and sponsorship remains the model for the transition. This may be enhanced by ITV and program related data downloads at a future date.

Cable and satellite do not play a major role in the Mexican market. Much of these delivery systems have broadcaster involvement with cross ownership. Currently cable is carrying up to 7 HD channels where the infrastructure permits and DTH is currently not carrying HD but has plans in a couple of year's time. Carriage of local Mexican content is not an issue.

HDTV in Mexico:

The Mexican transition plan is designed to supply HD service as the principal benefit. The target is 80% of the broadcast day in HD. This is very ambitious and probably initially means a lot of up converted standard video. But clearly HD is the goal.

At this point multi-channel TV is not a contemplated strategy. The view of the Mexican industry is that as conversion takes place it is sensible to change the production standards to HD at the same time as they build the necessary transmission structure. As noted earlier the Mexican production industry is formidable with exports key to their success. HD production and display figure very strongly in maintaining that business model.

The Future of Over the Air Broadcasting:

Little needs to be said about this issue in Mexico. Given the social and economic realities of the country over the air television is the most efficient and effective means to deliver services to viewers. Cable and DTH have made and continue to make a modest advance but more as a compliment to over the air television, rather than a threat. The future of over the air television is both robust and economically viable.

Fee for Carriage:

This is not an issue in the Mexican environment. While conventional broadcasters can negotiate a fee from distributors the strength of both cable and DTH markets preclude any meaningful payments. Like other jurisdictions, usually in kind services like channel promotion and local carriage dominate the benefits for broadcasters for retransmission considerations. This is not likely to change for many years.

Conclusion on Mexico:

Some observers are surprised that Mexico has embraced DTV and have chosen to go with HDTV as the main driver of the transition because of the social, economic, and political environment of the country. Mexico has a very robust broadcasting environment, highly profitable and of on going value to Mexican viewers. The broadcasters and government wish to protect their border markets with the US and at the same time make sure their flourishing production industry remains competitive and dominant in the international market.

Given the length of the transition plan all the stakeholders believe the transition can be done with economy and afforded by viewers.

UNITED KINGDOM

The UK has a very successful DTV transition underway and a very intricate plan involving stakeholders which include broadcasters, Government, the Regulator and transmission companies. This has spawned an amazing amount of coordination between the interests with over 8 committees and project groups providing on going management and direction of the transition. A feature of the plan is public communication.

The UK transition began in 1998 with the launch of Independent Television's ONDigital a pay digital terrestrial transmission service that failed miserably and ended in 2002. The license responsibility for the digital multiplexes to other players including the BBC, BSkyB, and National Grid Wireless resulted in a re-launch of DTT called Freeview at the end of 2002 with free services on multiplexes providing 30 TV channels and more than 40 program windows. The take up of Freeview in the last couple of years has

been remarkable, with digital receivers purchased now exceeding more than 2 million annually.

The UK has about 25 million households, of which 7.5 million are digital satellite, 2.5 million digital cable, and an amazing 5 million plus digital over the air homes. DTV homes now make up about 65% to 70% of UK households and while satellite and cable provide the majority of this number, it is clear that free to air digital services are now enjoying a tremendous up take. This is in a context that still sees the majority of UK viewers receiving their services over the air on yet to be converted analogue television and the new DTT services.

It is important to note that because of scarce spectrum and low power transmission the Digital coverage area probably will not grow to more than 75% of a region before ASO. There will be a month of simulcast, a shutdown of analogue service full power of digital transmission and moving the remaining 25% to DTT service in that brief one-month window. Not easy.

It is not particularly useful to look at the ins and outs of policy and regulation before Freeview began in late 2002.

Key Elements in Place Today:

1. Firm analogue shut off date is 2012.
2. Current digital multiplex coverage is 65% and will rise to 98.5% by ASO
3. Up to 30 services provided in free over the air multiplexes. Will include pay services.
4. No HD is presently available may be part of a future multiplex
5. Over the Air is extremely robust in the UK with viewing to digital and analogue services at more than 60%
6. Industry/government association jointly financed to promote ASO.

Policy, Regulation, and Related Issues:

- October 2002; Freeview Launch
- September 2003; Government commits to Digital Switchover policy
- July 2004; Ofcom (the UK Regulator) announces ASO will take place beginning in 2008 and ending 2012. In 2005 Ofcom confirms a regional transition approach with Manchester as the first large urban

- community planned for 2009 ASO and London the last large urban community planned for 2012.
- December 2004; completion of the Government's Digital TV Action Plan.
 - December 2004: Ofcom completes licensing of public service broadcasters (in the UK context includes conventional over the air commercial broadcasters) for digital transmission. Multiplex Operator Licenses for 12 years with an automatic renewal of another 12 years, designed to recognize the investment in digital programming are licensed by Ofcom. BBC licenses are part of their Charter and issued directly by the Department of Culture Media and Sports. A three tier licensing process jurisdictional under Ofcom:
 1. Transmission Operator must be subcontracted by the multiplex operator and basically provide the technical transmission operation
 2. Multiplex Operator; holds a key role in defining content on the multiplex (a multiplex operator may also be a conventional Broadcaster or television channel operator and in fact BBC, ITV and Channel 4 are all multiplex operators)
 3. Television Channel operator (license for each individual service are for 5 years with 5 year renewal possible)
 - 2005: Digital UK announced as the Industry group charged with promotion and education of ASO.
 - September 2005: Government announces approval of terrestrial analogue shutdown phased in over 2008 to 2012 as proposed by Ofcom.

The principle that all existing analogue license holders have access to a digital multiplex is embedded in the plan. To make the transition is simply not an option. As in other countries private broadcasters were initially worried about fragmentation in a DTT world but these concerns have largely been put aside in favor of getting as much shelf space on Freeview as possible for existing analogue services and spin offs of the core brand.

A government directive demands that technical DTT coverage reach 98.5% of the coverage area before analogue switch off can take place. Within that area it is the responsibility of Digital UK to inform, educate, and facilitate UK viewers to the new digital platform. Budgeted at over \$400 million Canadian with funding from the industry and principal leadership and funding from the BBC (a proposed increase in the license fee to cover the

costs) this group will be held responsible for meeting ASO targets with a minimum of viewer disruption. This is important to note because in most European situations and Australia, industry groups charged with mounting public campaigns and dealing with consumer issues is considered critical to reaching ASO with a minimum of dislocation. The UK initiative is the best developed and financed of all of these efforts.

It is worth noting the specific mandate of this group:

- Co-ordinate the roll out of Digital television across the country according to the government approved plan.
- Communicate with the public so they understand what is happening and know what they need to know in a timely manner.
- Liaise with equipment manufacturers, retailers, digital platform operators, and consumer groups to ensure understanding and support for the digital switchover program.

Broadcasters sit on the UK Board and it has strong links with government and the regulator. An impressive tool to manage the transition.

There are a number of other groups, government, and institutional bodies who are charged with responsibilities in making a successful transition to DTT. They all play a role and all coordinate their activities with one another with cross organization working groups focusing on technical, commercial, economic, competitive, quality, diversity, and social issues associated with the roll out. In any examination of a transition plan that appears to be working a detailed review about how these groups divide up their responsibilities and co-ordinate their over-lap is worth review.

One issue worth noting is the enormous technical work associated with a transition of this magnitude and time frame (this is true of other countries as well). It strains availability of trained transmitter engineers and technicians as well as though that must deal with plant and production facility changes. The work is both exacting and of an artificial volume that it must be carefully managed within the phased approach to ensure that all targets are met.

It is clear that choice is what is driving the DTT roll out and the up take of digital receivers. Freeview gives the old analogue viewer at least six times the number of services available (30 channels) and with a smart card access in the future access to pay services at modest cost. This enhances the value

of the over the air license and has been the leverage for the DTT plan over the last three years. The difficulty is that most of the 6 available multiplexes are filled or close to it. This leaves little or no room for new services like Mobile TV and HD.

Apparently two additional multiplexes will be made available over the next few years and it will be interesting to see whether Mobile TV and HD make their way to the consumer as a Freeview service or whether they will join the list of pay TV services that are lining up for licensing.

HDTV in the UK:

As in other European countries HD has not figured prominently in the UK DTT plan. It is all about more choice, a quality SDTV signal, and perhaps enhanced sound. Given the scarce spectrum and the desire to enhance the value of over the air service HD was not considered a major consumer benefit as it has in North America.

BBC is currently running some HD terrestrial and Satellite trials but there is, as yet, no plan for the introduction of regular over the air HD service. BSkyB the DTH provider is providing some HD offerings but they are modest in scope and penetration is low. MPEG-4 technology on the two new multiplexes planned for the future may well make HD over the air more viable than currently contemplated.

Having noted the above, most UK production that is contemplated for North America or Asia (Japan and Korea) is being produced in HD, or delivered in HD. The production community has well understood the importance of future proofing. BBC has a goal of a full HD service but as yet no announcements about how and when it will be broadcast, but they are gathering the necessary equipment and expertise to make the transition. It is assumed if the BBC goes down this road then Independent Television, Channel 4, and Channel 5 will probably go as well. These will join the existing movie and theme HD channels already being made available by Sky.

For the most part consumer TV sets sold in the UK are wide screen but in the European PAL standard television format. (This is true for most European countries). Many of these sets have built in Digital tuners and while the debate goes on in the industry between built in tuners and set top boxes the fact that there are so many sets coming to market with built in tuners seems to preclude a quick take up of HD or other enhanced services

for some time. HD displays and set top boxes are yet to make a major market impact, but they are becoming more widely available. As services become available consumers will want to future proof themselves with HD displays.

HDTV is part of the UK future. The BBC commitment towards HD production and distribution, international markets, future HD markets, and shelf life for the UK market will create momentum. HD trials will turn to HD service over the next couple of years and drive the rest of the UK market. Over the air carriage may play a modest role in HD distribution but like France and Germany, Satellite delivery of HD services appears to be the most efficient and effective way of reaching consumers within the availability of scarce terrestrial spectrum. The deployment of MPEG-4 technology will have a major role in enabling HD becoming viable on all digital platforms.

HD will not be a major factor in the DTT transition or in analogue shutdown in the UK in five years time.

The Future of Over the Air:

Clearly, with more than 60% of UK households receiving only over the air signals, over the air television seems to be in a healthy position for a robust future. Observers have noted that satellite television seems to have peaked or close to peaking in the UK market (it has been a very good business for BSkyB with about a 30% share of UK households) and cable to date has been a modest market factor in the competition for over the air viewers.

The value of over the air services seems to only likely to increase with digital terrestrial Freeview winning quick adoption amongst viewers. All broadcasters to maintain their market position are exploiting many more choice in channels and other potential value down the road. This is also supported by Legislative and Regulatory policy designed to ensure the quick and timely transition to digital terrestrial and analogue shutdown.

The BBC charter will be renewed at the end of the year with increases designed to give them more money to lead the digital transition and the commercial broadcasters are all getting behind the transition providing more free to air services. The large commercial broadcaster, ITV, has committed to the Freeview Digital terrestrial service and notes potential new profitable opportunities. They are also partners with the BBC in bringing free to air

Digital satellite services. UK broadcasters may always have the terrestrial over the air platform as their core but they are reaching out to be part of any platform available to them whether for commercial or public service reasons.

A strong over the air core gives the UK broadcaster the competitive heft for a multi platform strategy as well as a multi channel strategy. This will be enhanced by the introduction of ITV, Mobile TV, and HDTV on the newly available two multiplexes for the UK. The future may be considered as very positive for over the air broadcasting.

Fee for Carriage:

Most of the core conventional broadcast services are carried by cable but do not have a fee for carriage. There are no must carry rules mandated by Ofcom. A carriage fee for satellite may be negotiated but for the most part any fee is modest and not a key revenue builder for broadcasters.

Theme channels (Pay and Specialty) obviously have a subscription base that is subject to negotiation and payment. In some cases, Sky Satellite attempts to charge a fee for their carriage of the conventional broadcast service and other services that form part of the Freeview package. BBC in partnership with ITV is pursuing a free to air Satellite package which they will offer directly to viewers and Sky now offers a free service of some 200 channels (with the obvious strategy of moving subscribers to the pay tiers).

The distributors are now becoming concerned that the Freeview services are becoming so competitive they may lose market share to Freeview from their subscriber base. The issue of fee for carriage is murky at best and extremely subject to market pressure. Conventional services are popular and pervasive and distributor offering that does not provide easy access is likely to find a constrained market. The whole fee for carriage issue is in a state of flux (as it is for all of Europe). It will be subject to the availability of multi-channel conventional over the air platforms and the desire from broadcasters and service providers to maximize their distribution on every available platform possible; some subscription supported, some on fee for carriage and others supported by advertising. The balance of the business model is yet to shake out.

Conclusion on the UK:

The expectation is that the UK transition and ASO will proceed within the time frames noted. There are two concerns:

1. The availability of digital equipment in retail outlets and the ability of retail to cope with a huge demand as ASO approaches and is in the final phase
2. Can UK Digital maintain the industry support required to meet its commitment of effective communication and a smooth transition from analogue to digital?

Manchester switch off in 2009 will be the key UK test. There does seem to be an industry consensus to make this transition happen. Ofcom has received no opposition to the current plans. More importantly “political will” seems to be in place to see analogue switch off through to successful completion, making delays less likely to be tolerated.

UNITED STATES

Canadians are familiar with the US transition strategy and the development of HD based on the over the air DTV transmission standard. Nonetheless, it is instructive in any review of national digital transition strategies to note the key elements of the US plan, their milestones, and the projected end of their transition.

The development of DTV began in the late nineteen eighties with broadcasters and key industry manufacturers trying to find a spectrum efficient method for HD and an enhanced value for the over the air signal. Out of that came the development of the American Television System Committee (ATSC) transmission standard and the eventual DTV transition plan approved by the US Congress and managed by the FCC in late 1997. Interestingly this plan called for the conversion of analogue to digital but did not specify HD as the primary application. A reader would note that the legislation called for a DTV transmission of the analogue service as Standard definition but allowed for HD or multi-channel applications and enhanced services. HD became the application of choice by most broadcasters as the key consumer benefit and even today, there are few multi channel services (but there is some considerable experimentation underway.

In the late eighties broadcasters still had direct viewing to over the air services in the 40 to 50% range. Today that number has shrunk to around 15% with continued steady growth of cable subscription and the tremendous growth of digital satellite over the last decade. It was the hope of the broadcasters that digital terrestrial television would enhance the value of the quality of their signal in both video and audio forms and thereby increase the value of over the air broadcasting. In fact, while qualitative improvements have occurred with HD and surround sound, most viewers receive the digital signal retransmitted on cable and satellite despite the fact that 98% of the population has access to an over the air signal.

Government felt the digital benefit lay in both the enhanced value in the digital signal and the improved spectrum efficiencies allowing them to harvest the analogue spectrum for future wireless and emergency services.

Beginning in 1998 the US began their digital transition and while the path has not been without tumult they have now confirmed a firm analogue shut off date of February 2009 and have every likelihood of succeeding.

Some of the US milestones noted, began with legislation and regulation in 1996 and 1997, and were constantly added too or amended, with the last major piece of legislation January 2006.

Key Elements in Place Today:

1. Legislated ASO for February 2009
2. Current digital over the air coverage with 5 or more services is 98%
3. Digital simulcast of analogue channel
4. HD is the prime benefit of the digital offering with networks providing prime time, sports, events and some studio HD productions. Multi channels are allowed but for the most part not taken up by broadcasters.
5. Many Pay and Specialty channels providing HD programming delivered by cable and satellite (not required by law but a market decision)
6. Over the air broadcasting as a very modest share of viewers to the over the air signal, about 15 to 20%. Cable and satellite carries conventional services.
7. A 1.4 billion dollar subsidy is available in the form of \$40 coupons for consumers to purchase a digital set top box receiver.

Policy, Regulation, and Related Issues:

- 1996: Telecommunications Act approved by Congress makes Spectrum available for all current analogue license holders and a simulcast period with ASO proposed for 2006. FCC develops a regulatory framework and milestone plan. Analogue shutdown set for 2006 with a threshold of 85% US households having a DTV receiver.
- 1998 US broadcasters begin digital broadcasts in top ten markets
- 1998 to 2005 broadcasters complete digital transmission build out according to set milestones, initially through low power transmissions and today implementing full power transmissions (to approximate full analogue coverage contours). There was considerable angst and debate over the transmission standard itself combined with doubts about transition framework, timetable, and viability. However the US Congress remained resolute about the plan and the FCC managed the regulatory process in a manner that was considered even and fair handed by most parties
- 2003 a tuner mandate was announced by the FCC that gave details on built in digital tuners on sets in decreasing order of size beginning with those over 36 inches in 2004 and phased in so that by March 2007 all tuner television sets must be digital along with other receiving devices like VCRs, DVDs, set top boxes, etc.
- 2003/04 Plug and Play facilitated by the FCC, and an agreement with the National Cable Association and Consumer Electronic Industry featuring a built in cable tuner in the display, usually activated by a smart card to view digital cable signals including HD programming from conventional and pay broadcasters.
- 2005/06 Congress debated ASO and related issues. Congress passed legislation setting firm ASO date of February 2009. A subsidy for digital tuners was set at \$40 per coupon, two coupons per household if required (definitions included). A \$1.4 billion dollar fund has been set aside for tuner subsidy.
- The proposed harvested spectrum is in the process of being auctioned off or set aside for public safety and related matters. The money from auction will all be in the US treasury by 2007. Most auctioned spectrum will be used for mobile services and data.

The result of this broad outline of actions is that the conventional broadcast industry has virtually completed the transition to over the air transmitted digital signals. (Some 100 plus stations are not on the air but have building

licenses, frequency conflicts, or similar administrative reasons). Most American viewers have access to at least five DTV over the air signals and in some markets ten or more.

Cable and Satellite are equally making the transition to digital with HD capacity and both systems are providing a full array of over the air, pay, and specialty channel HD signals. Most US markets have access to over 30 HD signals from over the air, cable, and satellite sources providing hundreds of hours of HD programming. Most conventional networks are HD in prime time, sports, events and some studio based programming. Major news programs are expected to go HD over the coming year. While multi-channel services have not been a major feature of conventional broadcasting offers, PBS is a noticeable exception with multi channels characterizing their daytime programming and HD their evening offerings. Some commercial broadcasters are beginning to experiment in multi channel programming but to date the offerings have been modest.

To date there have been more than 40 million DTV television displays (most HD capable) sold to US households out of a market of about 110 million households. This number is expected to rise to the 90 to 100 million range by ASO. Increasingly DTV tuners are making their way into the market with almost 2 million set top boxes sold last year and, as noted earlier, built in tuners will be a fact in virtually all sets by March of 2007. Unfortunately, to date hook ups to HD with over the air tuners, satellite and cable fall well short of the number of displays sold with less than 35% of those sold hooked up to HD service. This number is improving rapidly but the deficiency in hook ups still represents a challenge to the industry.

While set penetration appears not be a problem, hook ups and tuners for DTV is becoming a worry for the FCC and some industry insiders as the ASO date approaches. There is a lot of information on digital television and HD in the US market place but there has been little effort for mass consumer education and marketing. Only \$5 million has been set aside by government for this promotion and it is recognized that government and the industry will have to become proactive as the ASO date nears.

ASO is a concept that consumers simply are not conscious of and do not appreciate. They simply don't understand what will happen with their existing analogue equipment when the time comes for the analogue switch to be shut off. An industry effort like UK Digital is something that the US will

have to consider. It is interesting to note that the industry seems somewhat sanguine about ASO, many believing that it will not happen or it will “all work out”.

As ASO approaches this complacency will change since there is very little likelihood of the analogue shut off date being delayed. The auction of the spectrum, the new services expecting to occupy this spectrum demanding access and the political realities surrounding analogue shut off will force a campaign of public education. It is ironic to note that an industry that will spend millions promoting itself and make billions more in advertising revenue is reluctant to promote the biggest change in the television industry since its invention. It will happen, however because in the end they will have no choice.

HDTV in the US:

From the very beginning of the digital transition, HD has been seen as the prime consumer benefit of over the air digital transmission. It has been cited by government, the regulator and the industry as the “gold standard” for over the air digital service. It has been an unlegislated benefit of the transition. This “informal” consensus that HD should be the main driver of DTV in the US has resulted in services as ubiquitous and easily accessible as old analogue TV used to be.

While initial costs were cited as a challenge, the economics of the industry allowed the large broadcast networks and groups to make the change, as well as pay and specialty services. Smaller independent broadcasters and small cable are still challenged with making the necessary upgrades for a full range of HD delivery but by ASO they are expected to be fully HD capable. Since much of the US production industry uses 35 mm film as their standard of choice, converting to HD either electronically or in finishing and delivery was not the challenge that other jurisdictions face. The blurring of production values between film and television production can clearly be seen on the television screens across the US today; better pictures, better effects, better sound and better production values.

It is probably not too strong a statement to say that the over the air digital transition in the US has been as much about HD as it has been about digital. This is not to say that all day parts and all services will be in HD but any TV

programming of value, high audience target and sales, and seeking shelf life and legacy will be produced in high definition.

The Future of Over the Air:

As noted earlier the share of viewing to over the air television from transmitted signals continues to drop in favor of cable and satellite. Yet, it is difficult to find a US broadcaster who would be willing to give up their spectrum in favor of distributed services. The business model for over the air television is still producing revenues much as it has for more than 50 years, even given all the fragmentation of the last 15 or 20 years.

Broadcasters appear to be very conservative in how they tamper with a business model that has been so profitable for so long. HD is just one example of how this community wanted to breathe continued life into an old model.

Advertising revenues seem to have peaked for the major four networks in the US and the fragmented market is demanding more services on more platforms to maintain and enhance those revenue streams. This search to maximize revenue is causing a focus to return on how to maximize the benefits of the over the air signal. New compression technology like MPEG-4 is being explored as a vehicle where the 6 MHz of broadcast spectrum could be stretched to provide not only HD service but also multi channels, interactive and streaming data for Download and Store technology.

It is amazing to consider that in a media world, which is becoming non-linear, television is still essentially a linear system despite initiatives like TIVO technology. This linear world will probably be a consistent feature for the foreseeable future but the industry growth will come from Download and Store technology and the industry in the US has begun to explore this in earnest. This exploration includes content; how to present it, deliver it, store it and view it. It will need the combined resources of content makers, broadcasters and the electronic industry to realize this new television world. The result could be the use of broadcaster spectrum in ways yet to be conceived and new life for an old business model.

This is not “blue sky” thinking but work that has actually begun in groups like the ATSC standards body. Some call it the second digital revolution in television and some call it the natural evolution of an old business model.

Whatever it is called there is likely to be a profound impact on traditional over the air television.

Fee for Carriage:

Fee for carriage has been a much sought after benefit by conventional broadcasters, which for the most part has never been realized. FCC must-carry rules have taken some negotiating ability away from broadcasters and the history of the industry has not provided for a model.

Broadcasters hoped that HD would be a benefit, which could see a fee for carriage, but despite the best efforts of the broadcast industry the need for distributor carriage to reach their markets demanded the need for carriage; fee or no fee.

It is interesting to note that the Plug and Play cable tuner built into sets probably reinforced cable's relationship with the viewer and helped drive viewers to cable for their HD hook up rather than getting the signal off air. The consumer is used to that method of delivery and if the broadcaster wants the market they need to make their signal available.

Satellite does pay a modest retransmission fee but it is not large and with the increasing popularity of satellite delivery broadcasters want their signal as part of their bouquet.

The future of fee for carriage for conventional broadcast services is not a likely source of future revenue for broadcasters.

Conclusion on the US:

The US transition is proceeding and will meet its analogue shut down date of 2009. Conventional broadcasters still enjoy a large market presence and the introduction of digital providing the ability to present HD within existing spectrum has helped preserve the business model.

In what is the largest and most competitive media market in the world the industry still required a government sponsored plan and direction to make the transition. Left to themselves the US broadcasters would have been very slow to make the transition. Given the present marketplace conditions the question of whether the industry can move forward to develop future benefits and dividends from digitally based services without a government

framework will be a challenge to the future relevancy of over the air television.

EUROPEAN UNION

The digital transition for terrestrial television has been given a European framework from the European Commission. The EC has not taken leadership in this but rather has framed their comments in light of Member States actions to date. In summary here are some of the key comments:

- Digital transition will encourage innovation and growth of the consumer equipment market
- For consumers the digital benefit is improved picture quality, better sound, more channels, enhanced services, and better portable and mobile reception.
- With analogue shutdown an economic benefit will be freed up broadcast spectrum, which may be reallocated to convergent services and pan-European electronic communications systems.
- It is recognized that transitional initiatives reside with national governments but increased national and pan-European benefits are realized by short transition periods.
- In light of the above **the Commission proposes a European analogue shut off date in early 2012**. Those Member States who have not begun switchover strategies and set ASO dates in conformity to 2012 are encouraged to do so. All states that have yet to set strategies and targets should be embarked on their transition by 2010 with switch off set for 2012.

Currently six states in Europe have set shut off dates for 2010 or earlier including the Nordic countries, Germany, Italy and Austria, (this is in keeping with the US, Japan and Korean planned shutdowns of 2009/10) six other countries including the UK have set 2012 as their ASO. France while targeting 2012 has not confirmed a firm date. Most of Western Europe is likely to meet the 2012 proposed ASO, but much of the newer Members of the EU from the old Eastern Europe still have a great deal of work to do if they are to realize that date.

It is clear that the Commission recognized both the need to create a critical mass of consumers to realize the success of a new technology, which then

depends on a large installed base receiving the benefits. It also clearly realizes that neither the full impact of saving or reallocating valuable analogue spectrum can happen unless there is a pan-European transition strategy; coordinated from the various national strategies. Their challenge lies in matching the pace of the transition in those countries now embarked and the slowest of the Member States.

The EU will do its best to facilitate Member States' transition strategies and fairness of access to digital spectrum for all players. The availability of the spectrum dividend at the EU level will focus on pan-European services and applications. It is interesting to note that the Commission is content neutral except encouraging choice but no specific HD direction.

CONCLUSIONS

Given this report it may be useful to make some observation in reference to the Canadian digital transition.

The Canadian digital transition strategy has been termed a “market place” approach with no deadlines or milestones. A few points outline the Canadian situation:

- 1997 Task Force on the Implementation for Digital Television in Canada presented to the Government with a comprehensive transition plan. No action was taken on the plan except for spectrum related issues for over the air broadcasters.
- September 1998. An all industry association, Canadian Digital Television, was mandated by the industry to manage the transition to digital television in an efficient and effective manner. The association was disbanded in 2006.
- 1998/99 ATSC digital transmission standard was accepted for Canada and spectrum is assigned by Industry Canada for all existing analogue license holders.
- CRTC provided a digital licensing framework for conventional over the air broadcasters in June of 2002 and for pay and specialty services in 2006. These decisions encouraged the display of High Definition programming but carry no mandatory adoption of digital licenses and are voluntary as to whether the industry chooses to make the transition or not. The business models and carriage circumstances of the

- analogue world have also been protected to the degree possible in the licensing of digital (HD) services.
- Aside from these basic developments there has been no concrete policy, legislative, economic or social initiatives to move the conventional broadcast industry to digital over the air services. Similarly, the Canadian production industry has not had any incentives to provide training and HD financing beyond the marketplace, which up to a year ago had been sending mixed messages about the production of Canadian HD programming.

Canada's market place approach has had some benefits. The industry decided a two-year lag behind the US roll out would save a great deal in early adoption cost for broadcast, production and consumer equipment. In fact this has happened and Canada has enjoyed the benefits of that decision. This plan always assumed that when the Americans became operationally viable with their digital over the air transmission services that the Canadian transition would begin in earnest. Regrettably Canada has fallen further and further behind the US and the two-year lag has turned into at least 4 years and maybe more.

As the US and other countries focuses on analogue shutdown as early as 2009 through to 2012, Canada only has transmitted limited digital over the air services in Toronto, Montreal and Vancouver (with Ottawa and Quebec City due for CBC/SRC service this year). Canada's pay and specialty services have made a modest beginning with HD services but nothing in terms of volume compared to their US counterparts.

Finally, Canada's production community is now beginning to embrace digital HD production but still the production of HD programs only represents between 5 to 7% of all produced programming. Canada has missed an opportunity to create shelf life for product produced over the last 7 or 8 years.

The reasons for this situation are rooted in Canada's broadcast legislation, regulation and the broadcast business model. Broadcasters have said repeatedly they do not see the value of building out digital transmission facilities across the country and going through the expense of simultaneous carriage of analogue and digital systems, particularly when most of their markets are delivered by cable and to a lesser extent satellite. The CBC seems willing to build out digital transmitted service, but only if they are

given additional funding for full coverage. The private sector would probably agree with that view if it applied to them.

Up until the last couple of years broadcasters have not insisted on HD delivery of independently produced programs. In addition, for the most part, broadcasters have not explored the potential of multi channel services on their digital spectrum allocations opting for HD programs, mostly procured from US sources.

To be fair commissioning of prime time drama programs, made for TV movies, and in particular the production of sporting events has increased a great deal over the last two years and there is a visible effect on the screen. The challenge is to make a definable viewing experience for Canadian HD in the sea of US product; ever the Canadian challenge.

While Canada is challenged by the media colossus to the south it does have a regulatory framework, which protects Canadian broadcasters from competing foreign digital services. This situation may be a disincentive for broadcasters to embrace the digital transition compared to the other countries reviewed in this paper. There also is not the same kind of spectrum challenge in Canada as found in Europe or the same pressing need for analogue broadcast spectrum for other services (although this latter point is now being challenged by service providers interested in supplying mobile and convergent services). In short, Canada has not had the same kind of market pressure as other countries to make the transition to digital whether HD or not, in an efficient and effective manner.

It is interesting to note that digital HD displays have had a take-up in Canada similar to that of the United States. Close to 3 million displays will have been sold in Canada by the end of 2006 with growth trends in sales similar to the US. Projected through to 2011, Canadian households should all have HD displays - many of them with built in over the air tuners and the cable plug and play capacity (currently not available from cable providers). However, hook ups to available HD services have been slow with only about 400,000 HD hook ups to cable and satellite with virtually no over the air viewing. This will change gradually as consumers understand what is available and how to get it. The availability of more Canadian services and better promotion by the broadcast community will drive consumers to these new services. As in the US there is a hook up lag and for the most part the

better wide screen picture as displayed by DVDs have pushed the market along.

Government has, to date, shown no inclination to make any change in its policy of a market driven approach. This in the context of the mounting evidence of successful European, Asian and American transition strategies, which have specific milestones, firm ASO targets, and legislation to back the plans up. To be blunt there seems to be no political will to take the necessary actions to create an effective digital take-up in the over the air spectrum for conventional broadcasters.

If this were to change there are some things the policy makers and the regulator should consider:

- A focused industry consultation on the future role of over the air conventional television and the viability of over the air signals as part of the broadcast business model.
- If the desire to maintain over the air services remains for both public policy and commercial reasons then a proper roll out plan should be negotiated and published with hard milestones, economic incentives if required, and a firm analogue shut off date.
- If the over the air system is to be compromised or reduced in scope for digital delivery then innovative solutions will have to be found on distributed services for the carriage of local, conventional broadcast services. A fee for carriage of conventional services may be considered as a part of this new regime
- The government will need to rationalize the need for analogue spectrum for new mobile and convergent services and the current stalemate on broadcast digital build out
- A strategy will be required for the production community to convert to HD production capacity.
- A government-mandated body like UK Digital or other successful platform groups will be required to manage the issues surrounding meeting the milestones, analogue shut off and consumer education and problem solving. Money and promotion will be required for this work from industry and public sources.

It seems inconceivable that Canada would be left behind a global transition to digital production and over the air distribution. While HD programming

does not have a universal reach in the countries adopting digital transition strategies, in the context of North America it will be critical to ongoing competitiveness for viewers. For foreign markets, the HD production standard is the internationally recognized standard for program exchange (sales) and may be down-converted to any lesser display standard easily. It will also be the standard of choice for multiple platform distribution since a down converted HD picture brings a much better resolution and picture clarity to a medium with less bandwidth.

Canada is once again at the crossroads of the television industry future. Decisions made about the transition to digital over the air services over the next couple of year will have a lasting effect on the business viability and cultural mandate of Canada's conventional broadcast system. Not to make a decision about the digital transition and eventual analogue shut off is in fact making a decision that may have irrevocable negative impacts on public policy and the industry and viewers that the current policy, legislation, and regulation supports.

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