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## GLOSSARY

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<tr>
<td>ATSC</td>
<td>Advance Television Systems Committee</td>
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<tr>
<td>Digital Television</td>
<td>Digital Television involves coding video and audio signals and then compressing them into ones and zeros. The format is more robust and uses lower levels of power.</td>
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<td>Digital Switchover</td>
<td>The process of removing the analogue television transmission and replacing it with digital signals</td>
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<td>DVB</td>
<td>Digital Video Broadcasting</td>
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<tr>
<td>DVB-T</td>
<td>Digital Video Broadcasting - Terrestrial</td>
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<tr>
<td>HDTV</td>
<td>High Definition Television</td>
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<tr>
<td>ISDB</td>
<td>Integrated Services Digital Broadcasting</td>
</tr>
<tr>
<td>‘Must Carry’</td>
<td>Rules about the extent to which cable and satellite providers are obliged to relay the services of terrestrial broadcasters</td>
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<tr>
<td>Obligations</td>
<td></td>
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<tr>
<td>Simulcasting</td>
<td>The simultaneous transmission of analogue and digital broadcast signals to allow access for consumers on both platforms</td>
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1.0 Introduction and Overview

This report is on the Digital Switchover Workshop and Adjunct Activities hosted by the Broadcasting Commission of Jamaica in March 2008. The workshop was the second of its kind held by the Commission. The first Workshop on Digital Switchover was held in 2003. This follow up Workshop was delivered over two days:

- **Day 1:** March 3, 2008 – 9:00 am to 5:00 pm: Workshop for Industry Stakeholders
- **Day 2:** March 4, 2008 – 11:00 am to 12:00 pm: Policy-Briefing for Commissioners in the Broadcasting Commission
  
  March 4, 2008 – 2:00 pm to 4:30 pm: Policy-Briefing for Policy Makers, Regulators and Academics

The main presentation on both days, entitled “Digital Television Switchover”, was delivered by Michael Starks, an international expert on the subject. He managed the UK Digital TV Project and planned UK’s switchover strategy which is now underway. Prior to that, he led the BBC’s developmental work on digital television including their initial feasibility study. He was the Founder-Chairman of the Digital TV Group in the UK and is now an associate in Oxford University’s Programme in Comparative Media Law. Mr. Starks is also the author of *Switching to Digital Television* based on a comparative study of digital switchover policies across the globe.

A key part of each day’s events were discussions where questions and comments were invited from the floor on the presentations. Issues raised have been documented herein.

**Summary of Key Questions and Comments Raised and Stakeholders**

1. Why Switchover?
2. Feasibility of Switchover
3. Implications of Switchover, including: what does it mean for stakeholders in terms of cost and who will pay?
4. Global Examples and
5. Executing Switchover

**Key Points of Consensus:**

- Switchover is a necessary consideration in light of spectrum constraints;
- Decisions must be made in tandem with CARICOM neighbours;
• A feasibility study needs to be done to determine the process going forward;

• Best practices globally should be researched, documented and applied to the local context;

• A similar workshop should be held with consumers garnering their views and documenting their concerns;

• Analogue switch-off should be the ultimate goal of the Switchover Policy with a specific date;

• There should be a proper analysis of the drawbacks of Digital Broadcasting.

Main point of debate

• The issue of the technical standards to be selected is a contentious one with cable operators on one side lobbying for the use of DVB technology and with some broadcasters (and the MAJ) on another side lobbying for the ATSC standard. Quite a bit hinges on this decision and it may be the single most significant decision of the switchover policy.
2.0  DAY 1 - Digital Switchover Workshop

Monday, March 3, 2008

Target Group: Industry Stakeholders

2.1 Overview and Programme

The workshop on the first day had ninety (90) participants from a range of entities in broadcasting, subscriber television, telecommunications, regulation and government. This group included CVM Communications Group, RJR Communications Group, Jamaica Association of Community Cable Operators (JACCO), Columbus Communications, Cable and Wireless (C&W), Ministry of Information Culture, Youth and Sports, Spectrum Management Authority (SMA), various cable operators and one representative from the Telecommunications Authority of Trinidad and Tobago (TATT). The full list of participants can be found in Appendix I.

The Programme for the first workshop was as follows:

9:00 am  Welcome – Mr. Cordel Green, Executive Director, Broadcasting Commission

Welcome Address – Dr. Hopeton Dunn, Chairman, Broadcasting Commission

Minister’s Address - The Honourable Olivia Grange, MP, Minister of Information, Culture, Youth and Sports

Feature Presentation - Mr. Michael Starks, Consultant

10:30 am  Questions and Answers

Noon  Lunch

1:00pm  Presentation: Digitalization from the Spectrum Regulator’s Perspective, Mr. Henry Batson, Director of Spectrum Engineering, Spectrum Management Authority and Mrs. Michele Thomas, Director of Policy and Strategic Planning, Spectrum Management Authority

Presentation: Digitalization from the Industry Perspective (1) – Broadcast Media Sector, Dr. David McBean, Executive Member, Media Association of Jamaica (MAJ)

Presentation: Digitalization from the Industry Perspective (2) – Subscriber Television Sector, Mr. Wesley Anderson, Jamaica Association of Community Cable Operators (JACCO)

2:30 pm  Panel Discussion

3:30 pm  Closing Comments - Dr. Hopeton Dunn, Chairman, Broadcasting Commission
3:45 pm  General Adjournment (followed by Technical Session involving a small group of stakeholders)
2.2 Summaries of presentations

2.2.1 Welcome

*Mr. Cordel Green, Executive Director, Broadcasting Commission.*

Mr. Green’s welcome began with an apology for the late start. He then welcomed the participants to a discussion predicated on a worldwide transition towards digital technology. He continued that this context raises a number of complex and pressing policy agenda encompassing the regulation of issues for both broadcasting and telecommunications. He also advised that the workshop builds out of the 2003 Digital Workshop which looked at the ATSC standards. This second workshop is meant to move the process forward understanding there is now some urgency.

He then invited Dr. Dunn to deliver his welcome address.

2.2.2 Welcome Address

*Dr. Hopeton Dunn, Chairman, Broadcasting Commission*

After greeting the workshop participants the Chairman advised the gathering that the Broadcasting Commission was at the start of embarking on digital switchover in the broadcasting and subscriber television sectors. The Commission felt that the best way to frame the process would be through making decisions in a consultative manner, especially in light of the fact that there are issues of technical standards and time tabling, among others, which need to be addressed. Ultimately the crucial time frame of digital switch-on and analogue switch-off must be decided.

Dr. Dunn noted that the beginnings of the transition are under way with the initial phase in the process taking place five years ago in the first digital workshop hosted by the Broadcasting Commission. Otherwise broadcasting and subscriber television providers have already embarked on transitions to digital standards. Continuing this process and creating a digital broadcasting environment will open new opportunities for local cultural products and will expand the reach and capacity of Jamaican programming globally.

The Chairman then made reference to the global environment, including countries such as the United States, United Kingdom, South Africa, Australia and Malaysia, all of which have declared a specific date for digital switchover and related policies. He noted that the US has had many changes in their timetable but that switchover will ultimately take place in February 2009. Similarly, the UK has embarked on a rolling operation with switchover taking place on a phased basis.

The Broadcasting Commission’s position will be to analyze these existing cases as well as other international imperatives from the International Telecommunication Union and similar bodies. This would be the best way to ensure that Jamaica is not to be left behind in the process of digital switchover.
The Chairman advised that there are several possible benefits to digital switchover which should be considered for the Jamaican context. A largely digital media environment will bring new opportunities in technology determination, content creation, distribution and reception in the short term. These benefits would be particularly important to Jamaica as a country which markets its cultural products internally and internationally. In addition, the digital transition would allow for more efficient usage of the spectrum, especially in light of the fact that there is near full utilization of the local FM radio spectrum.

In closing, Dr. Dunn encouraged frankness and active participation as this Workshop would lead to crucial decision making on the way forward.

2.2.3 Minister’s Address
The Honourable Olivia Grange, MP, Minister of Information, Culture, Youth and Sports

Minister Grange opened her speech with greetings to the audience and conveyed her pleasure in delivering the Keynote address at this function taking place at this exciting time in world history.

Min. Grange noted that in the digital age where we speak of the ‘global village’ and of a ‘borderless world’ we must now come together and focus on how we can achieve Universal Access to digital technologies. Digital Switchover represents one of the roads to achieving this.

The Minister reminded the gathering of how world news was delivered in the 1960s physically coming in a bag from Biznews in London. By this method, Jamaicans were provided with details of world events at least one day old. This was contrasted with the immediacy of the Internet and mobile technology in the 21st century which deliver data and images anywhere in real-time, even allowing Jamaicans overseas to know of local happenings before those at home. Giving Jamaicans the ability to access these steady streams of information, would be one of the goals of Digital Switchover.

In acknowledging that there are many challenges that Jamaica may face in the transition, the Information Minister stated that discussion and debate on the central matters will serve to improve the lives of Jamaicans through education, entertainment and business opportunities. In light of the creation of the Single Market and new international rules of trade that will come with it, Jamaica needs to leverage the advantage of the creative industries in the digital age. The Minister advised that the Information Ministry is in an advanced stage in the policy process needed for issuing of another islandwide cable licence using wireless technology. With these considerations, there would be wide scope for development of creative industries locally.

The Minister commended the Broadcasting Commission for initiating dialogue with stakeholders who were well represented at the event. She encouraged the industry stakeholders to face the realities of doing business in the digital age head-on especially considering the financial gains possible and the benefits to the consumer. Such benefits for the consumer include:

- The introduction of video-on-demand and pay-per-view
- More digital channels
• Greater interactivity and choice in media services
• High Definition (HD) services
• Non-Television services
• Parental control of the programming children can access

The Minister also touched on the likely benefits for industry players including:

• Greater exportability of content created
• Greater opportunities for performance artists such as dramatists and talented youth
• Mitigating the problem of limited FM frequencies

For countries who have timetabled switchover, Minister Grange noted, switchover dates are scheduled between 2008 and 2012. Jamaica needs to determine its own timetable noting that all the unique challenges must be considered. This is why consultative workshops such as this one are so important.

The Minister apologized for having to leave in order to attend Cabinet later that morning. She closed by inviting the workshop participants to begin the process through open discussion in the workshop.

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1 The Minister was provided with a detailed briefing session on March 4, 2008 about the events of the Workshop.
2.2.4 Feature Presentation
Mr. Michael Starks, Consultant

Mr. Starks stated that he felt privileged to share his insights on the digital switchover issue. He prefaced his presentation by saying his experience is that every country is different and there is no one size fits all solution.

Introduction of Concepts

Digital television codes and compresses broadcasting signals making them more robust and allowing greater capacity with the potential for interactive services, mobile TV, HDTV and spectrum savings among other possibilities.

Digital Switchover is building out the transmission of digital television and then, after a period, the ceasing of analogue transmissions. This would require new digital equipment for receiving and sending digital signals. It does not necessarily mean buying a new television, but it could mean acquiring a set-top box that converts the signal to digital for the time being.

Developing a Switchover Policy

Countries need to decide if a switchover policy is necessary. The government could just do nothing and let the market take its course, however this approach may rule out early benefits of spectrum savings. The transition to digital television is inevitable and it and will change broadcasting services. To that end, planning in a coordinated way is important. A switchover policy would allow for that type of planned transformation of the television sector with benefits to consumers and cultural industries.

Policy elements as detailed by Mr. Starks were:

- Encouraging voluntary take-up of digital television by consumers;
- Giving analogue broadcasters digital spectrum to begin their transition;
- Simulcasting – the delivery of broadcasting signals by both analogue and digital means for a time until it is possible to switch off analogue transmission completely; and
- End Phase – the time for compulsory switch-off.

Coordinated switchover to Digital Radio may not be deemed practical due to the large number of existing radio sets and stations. A solution would be to have digital radio co-exist with analogue AM/FM Radio.

Global Cases in Digital Switchover

Mr. Starks mentioned a number of countries which are considered ‘pioneers’ in digital switchover including the Netherlands that switched over completely in 2006 and other including the US, France and Japan who all plan to be switched over before 2012.
Some common principles when developing and executing a Digital Switchover Policy include:

- Implementing digital terrestrial as a stage in switchover as the easiest way to transition analogue transmitters;
- Stakeholder collaboration can be used to reduce risks;
- Use of subsidies and incentives, being mindful of not giving unfair advantage to some industry players; and
- Ultimately, analogue switch-off is the goal

The challenges faced by countries that have started the transition include bankrupt commercial broadcasters, slow take-up by consumers and repeated postponement of the switch-off date, which can affect credibility and buy-in. In addition, systems need to be in place to deal with the disabled and the aging that may not be able to afford the necessary equipment to receive digital signals.

**Feasibility Study**

Mr. Starks purported that in any jurisdiction a feasibility study is recommended in order to assess the best way forward in relation to the unique context of that country. This would be essential research into:

- who will be affected;
- what are the costs and benefits; and
- what is the best proposition to the consumer that will motivate take-up?

In terms of the selected standards of digital television to be employed, a country must decide which technology is the best for its technical and commercial interests whether DVB (European), ATSC (US) or ISDB (Japanese). In this regard dialogue with stakeholders in a feasibility study is important to determine the best decision for Jamaica.

Other questions to be answered by the study would include:

- What is the best cost for set-top boxes?
- What do the consumers want?
- Where will subsidies or incentives be necessary (if at all)?
- Will there be ‘must-carry’ obligations?
- When should analogue be switched off?

The ultimate role of the government in the process is to persuade the public and gain buy-in from both consumers and industry players.
The First Steps

In getting started Mr. Starks advised that the necessary steps include stakeholder collaboration and the effective documenting of the Jamaican situation in relation to the topic. As such the following are the first steps in the process:

- Convene a gathering of stakeholders
- Understand the subject
- Answer the question: Do we need a policy?
- Publish an explanatory paper – Work in Progress
- Digest consultation responses
- Research the matter
- Embark on a feasibility study

The consultant concluded by noting that although every national market is different, political risk is normally mitigated where uptake is voluntary and stakeholder collaboration is usually necessary to develop an effective and relevant policy.
2.3 Comments and Questions from Opening Session

The following is a summary of the questions and concerns raised.

**Why Switchover?**

- What is the great benefit to switchover from analogue to digital in our situation?
- Is there any country that thought that digital switchover was not necessary?
- Can our disposition to the switchover be informed by the view that there may be a certain amount of inevitability to this switchover and at some point it may become normal?

**Feasibility of Switchover**

- In the Caribbean, resources are key issues, and particularly in terms of the spectrum, what model can be used to introduce digital transmission where the spectrum is already limited?
- Digital feeds are more delicate than analogue feeds, how delicate will the transition be?
- What if the Broadcasting Commission decided that it is not feasible for the country as a whole but individual companies could choose to switchover?

**Implications of Switchover**

- How much is the varying cost to the consumer?
- These issues involve very complex legal and cost issues. This could mean a total overhaul of media industry at all levels, including the man who sells TV antennas on the street. How feasible is it for Jamaica to undertake this in the near future?
- What are the environmental issues that may be connected to this transition?

**Global Examples**

- Is there any way that technical information sharing across the region can allow for economies of scale, is there a possibility of cost reduction?
- Is there any knowledge of what has happened in countries similar to ours?
- In the US the transition is immediate but in UK it is phased. Which model is Jamaica likely to adopt?
- Are smaller firms are being gobbled up by larger companies in relation to switchover policy?

**Executing Switchover**

- In terms of spectrum allocations for digital signals, is the spectrum regulator looking at channels that could not be assigned due to the limited space?
• What are the benefits for public service and community broadcasting?
• Will switchover have an impact on elimination of interference?
• What would be the impact of digital switchover on archives?
2.4 Summary of Responses (mainly by Michael Starks)

- Jamaica ultimately must find its own answer to what the benefits will be and what the best timetable for the switchover is. This would include whether there actually are benefits for switchover in this market and what services Jamaicans want. This would be done through further consultations, collaborations and the feasibility study.

- In the event that transmitters need to be replaced it may be best to go digital at that point in time. The market for analogue transmitters will soon die out and so because of underlying economic reasons Jamaicans may want to switchover incrementally in this way.

- The right answers on the matter of spectrum availability and interference will depend on Jamaica’s unique situation. Even where the spectrum space is limited sometimes it is possible to find spaces in between to allow for digital transmission.

- Regarding the extent to which digital signals are ‘delicate’, there is a need to be careful around the edges as although ghosting and fading will be eliminated, freezing instead will be the concern and so that is a consideration with switchover to digital transmissions.

- **The Chairman:** The Broadcasting Commission would not likely decide to leave switchover up to specific companies based on global trends. But any decision on this score would depend heavily on outcomes of consultation with service providers.

- On the matter of cost to the consumer, there could be a range depending on the needs of that consumer and the type of service desired. In terms of set-top boxes, the higher the uptake the lower the costs will be. The average in the US is about US$40.00. If the uptake is high the cost could be comparable here.

- Regarding environmental issues, there may be an enormous amount of old TVs that may pose a problem of waste disposal and damaging environmental effects. This is where the role of the set top box is important because it would eliminate the need for consumers to throw out their TVs.

In terms of energy consumption it was found in the UK that the additional electricity used due to the set-top box when aggregated was not negligible. However, with switching to a digital television there will be cost saving as it uses less power.

- **The Chairman added:** Also, we need to be wary of the possible dumping of analogue TV sets from markets that no longer need them.

- It is possible for countries as small as this one to use economies of scale? For example, New Zealand used new compression standards from France for cost-effective delivery of HDTV services in spite of their small population.

- **The Chairman added:** In the regional context the real decision will be about the standards and that will drive how we cooperate and collaborate. We are already
establishing collective regional approaches as we are working along with Trinidad and Tobago in particular on that score.

- To use the UK as an example there were no special problems for small businesses; on the contrary, there are now more opportunities in the market for smaller companies.

- Public broadcasting plays a leading part in every country. For example, digital TV offers these stations more opportunities to provide wider range of services. BBC has introduced several new channels with a variety of new targeted programming. Similarly, communities will benefit from new spectrum opportunities.

  o **The Chairman added:** In terms of the cost of the transition to industry players, it is believed that, like the transition from black-and-white to colour televisions, the capacity does exist in this country to confront these challenges, so in consultation we will manage.

- Digital TV represents an opportunity for the use of archives that could be capitalized on similarly to what the BBC has done in introducing archives on their channels. However, cost is a significant factor as it relates to negotiating rights agreements.
2.5 Panel Discussion – Summary of Presentations

2.5.1 Presentation: Digitalization from the Spectrum Regulator’s Perspective

Mr. Henry Batson, Director of Spectrum Engineering, Spectrum Management Authority and Mrs. Michele Thomas, Director of Policy and Strategic Planning, Spectrum Management Authority

Digital TV

Mr. Batson led the presentation from the SMA. He began by speaking to the existing inefficiencies in analogue TV. Digital TV (DTV) was regarded as more efficient in terms of use of power and sensitivity to interference with much sharper image and sound quality. With DTV snowing, noise and ghosting are eliminated. DTV can offer a variety of information services for new business opportunities as well as for social needs (such as health and education).

There are three competing standards in DTV: DVB-T, ATSC and ISDB-T of which Jamaica needs to choose the most efficient for its needs. Within the context that 76% of the television spectrum is available, existing broadcasters could be assigned further spectrum to offer DTV.

Why close analogue?

Mr. Batson purported that analogue TV should be closed for the following reasons:

- To release spectrum for other uses/users
- To enable greater coverage for digital service
- To allow for more digital services
- To reduce transmission costs (due to lower power, replacement of aging equipment and reduced relevance of terrestrial services).

DTV offers exciting opportunities including more channels, new players and increased competition in delivery. However, he noted that switchoff must be a clear focus to succeed. Issues that must be addressed before proceeding would include:

- Choice of Technology and Standard
- Cost to broadcasters and consumers to convert to the new technology platform
- A new TV channel numbering system
**Digital Radio**

Digital Radio is another concern when speaking to the issue of Digital Switchover. Eighty-six (86) per cent of the FM spectrum is utilized and ten (10) per cent of the AM spectrum. Some companies are branded using FM assignments which could lead to marketing problems if the spectrum has to be re-allocated or if more than one player is assigned to that band.

The competing standards in digital radio are IBOC (HD Radio) which uses the current AM and FM spectrum and EUREKA-147 which is branded as DAB (Digital Audio Broadcasting). The advantage of IBOC would be that persons with HD radio sets will be able to tune in to both HD radio signals and current analogue signals. The advantage of DAB is that it uses the L Band (which is 95% unassigned) as well as the VHF Band.

As with DTV, the opportunities with Digital Radio are many. Similarly a clear focus on Switchoff is required for the switchover policy to be successful.

**Regulatory Issues**

Following on her colleague’s presentation, Mrs. Thomas re-iterated that digitalization offers improved efficiencies in the use of broadcast spectrum. These are referred to as “Digital Dividends”.

The present policy, legislative and regulatory framework is highly fragmented as the SMA does not issue licences but authorizations for use of spectrum to which no fees are attached. Various challenges are raised therefore in terms of spectrum fees and use of the resources of the Authority. Digitalization in the converged environment would require a less fragmented approach in favour of a single regulator.

Emerging regulatory issues have to do with:

- Convergence of technologies changing the way the spectrum is utilized
- “Freed-up” broadcast spectrum could be used for other services including broadband
- Reconsideration of the present licensing regimes, terms and conditions of licensing and spectrum pricing
- The fair treatment of incumbents as against new entrants

On the side of implementation, Mrs. Thomas suggested a phased approach to switchover that would take into consideration the interests of local businesses and consumers within the framework of regional and global contexts.
2.5.2 Presentation: Digitalization from the Industry Perspective (1) – Broadcast Media Sector

Dr. David McBean, Executive Member, Media Association of Jamaica, Broadcast Media Sector

Dr. McBean prefaced his presentation with the question as to why there is a ‘hard rush’ on Digital Television and not Digital Radio. He advised that research showed that broadcasters are using valuable spectrum, i.e. channels 52 to 69 on the UHF band. These bands are wanted for telecommunication use. Projections for auction of spectrum in that band are US$30-40 million and this could be the reason for the focus on Digital Television as opposed to Digital Radio.

**Why digital?** It allows for more efficient spectrum use as well as value added features, for example, selecting camera angles, interactive overlay graphics, pay per view and HDTV. While the benefits of digital broadcasting are numerous, one of the drawbacks is that there is either good or bad signal, hardly any in-between.

In terms of Digital Radio, DAB seems to be the dominant standard globally, but it is not compatible with broadcasting or user equipment in Jamaica. There are about 3 to 4 million radios in the market, so digital audio switchover would represent a significant change for many people. We need to ask: what is the size of the possible market for these services and what would the consumer be willing to pay for this transition if at all? These are the stakeholder and Cost Benefit analyses we need to do.

For Digital TV, the commercial reality is that we live in the shadow of the US. That is where we get most of our equipment and it is the primary source for technical support. The US’s transition in 2009 will have an effect on the local market with analogue equipment being phased out. But the broadcaster switching over due to these imperatives will not be beneficial if the consumer cannot receive digital signals.

The question we have to ask is who should pay the cost of the transition: broadcaster, end user, government or a combination? Would the government provide subsidies for converters, which cost about US$50.00 to US$70.00 dollars?

Speaking on behalf of the MAJ, he conceded that Europeans and Japanese are doing a better job than Americans at developing the technologies but we have to realize that we live in a certain sphere of influence controlled by the US.

On the matter of Digital TV, standards selection is the key and the US standards make most sense. We need to think about the additional costs that would be incurred if we used other standards in terms of getting equipment and technical support, especially in light of language barrier issues.

As a country we need to look at whether competition has begun to be destructive. There are small radio stations that are now struggling to stay alive due to the competition. We should ask ourselves whether there really needs to be more competition there, as a priority. Also, we need to see where any transition to Digital Television can enhance the preservation of our cultural content, and what the role of public broadcasting is.
Finally, we should be careful how we compare ourselves to the North as a country with 2.6 million people and a GDP per capita of approximately US$3,500.00 as opposed to a much larger population in the US with a GDP per capita of US$30,000.00. Considering this we need to be on the leading edge and not the “bleeding edge” by doing adoptions at a stage when things have settled down so that investments can be recuperated because we do have small economies. Regardless of the decisions made in this process, the policy must be shaped so that Jamaica and the Jamaican consumer is the ultimate winner.

2.5.3 Presentation: Digitalization from the Industry Perspective (2) – Subscriber Television Sector

Mr. Wesley Anderson, Jamaica Association of Community Cable Operators

Mr. Anderson’s position was that the issues are clear cut. It is not about reinventing the wheel, but about clarity and expertise to have a smooth switchover. He applauded Broadcasting Commission for providing the opportunity to benefit from the expertise of Mr. Starks and noted the importance of this issue to the STV sector.

Mr. Anderson then related the ‘story’ of subscriber TV development in Jamaica. This began with some persons acquiring satellite dishes and offering links to neighbours as a business opportunity. There were fulfilling the need of Jamaicans who love to watch television and provided that service at a low cost. The industry evolved later when cable operations replaced the need for large, unsightly satellite dishes. These cable operators later became licensed and legal now operating in a regulated environment.

The story is still unfolding and this workshop is a new chapter in that story. As small operators, Mr. Anderson notes, they are expected to offer services at the same standard as bigger operators and are prepared to do so.

STV providers’ understanding of switchover is summed up on the US’s WGBH-TV website which has an advertisement for switchover. The ad warns customers of the transition which will take place on February 17, 2009 but states that once their television is connected to the cable service, their television service will not be interrupted. Otherwise they will need to have a converter box or digital television.

Mr. Anderson used this example to prove his position that switchover is almost a non-issue for cable operators. They receive digital signals from overseas and normally have to retransmit them and convert them for an analogue receiver. He advised that technical questions will be handled in the question and answer section later.

In conclusion, Mr. Anderson stated that even when STV providers start to transmit a digital service, which will be soon for some, they will simulcast. Many places in the US are still doing that. This reduces frustration for the consumer and allows the operator to continue providing the services at affordable prices. As such, Mr. Anderson’s suggestion was that, all the Broadcasting Commission really has to do is to convince the viewers to switch to affordable cable service.
2.6 Panel Discussion – Questions and Comments

Donovan Campbell, Technical Officer of the Broadcasting Commission, joined the panel for the Question and Answer Section.

Questions / Comments posed to the SMA:

Is there an issue that would arise based on the equipment that SMA asked us to purchase for compliance 3 years ago? *(Gary Allen, RJR Communications Group)*

- **Mr. Batson:** That exercise allowed us to accommodate some additional players and gain some order in the spectrum assignments. So that clustering exercise is not redundant. There are some new decisions facing us in terms of opportunities and choices to make life better for all of us. This is an excellent opportunity to make some decisions that allow us to be able to accommodate more players.

Is the government prepared to subsidize the consumer? *(Chad Young, Grove Broadcasting)*

- **Thomas:** That has been considered in other cases and it is something to think about.

Questions / Comments posed to Dr. McBean:

Why would you prefer to use US standards especially where some equipment can allow for use of dual standards and interoperability? *(David Cassanova)*

- **McBean:** If we look to the example of telecom. TDMA used to be the US Standard and GSM the European standard. GSM later became the adopted widely in the US.

  In this case you are talking about where you get your TV sets from, your technical support, your economies of scale and even your time zone. So it is not always the better technology. Similarly this happened with Beta Max and VHS and, even a few weeks ago, BlueRay and HD where there were two competing standards and one of them gained strength in the market.

**Cassanova:** What of add-ons that can allow for interoperability?

- **McBean:** That was made out of the need to get a toe-hold in the US market and allow the equipment to function in the ATSC system. There is no great advantage. Also, add-ons normally don’t work in my technical experience in terms of backward compatibility issues and migration issues.

**Cassanova:** Set top boxes for DVB that are made in Korea and China are much cheaper…
• **McBean:** You are talking about one cost. We have huge capital cost in terms of the core technology, the equipment and the technical support and those outweigh cost benefits for receivers.

**Questions / Comments posed to the Broadcasting Commission:**

There has to be a serious look at both systems to determine the best choice with the best long term solutions for Jamaica. *(Unknown)*

• **Campbell:** We wouldn’t want to make a decision lightly. Careful studies would have to be done in consultation with the industry to choose the right technologies because it will impact on their future existence.

**Questions / Comments posed to Mr. Starks:**

In your experience in the UK, is there a pressing need to accommodate the players in the limited FM frequency? *(Cordel Green)*

• **Starks:** I would repeat my suggestion to have digital audio co-existing with AM and FM. Digital audio is a slow burn technology. About 10% uptake has taken place in the UK and we are using DAB, but it is growing. We can’t point to a year when they will close down analogue radio and I don’t know of any country that plans to shut down analogue radio at a prescribed time.

Can we get a better perspective of what could happen in the future? How will it benefit the end-user? At what cost will it benefit the consumer. Could you give a country that we could use as an example to say how switchover has benefited the consumer? *(Steve Malcolm, National Consumers League)*

• **Starks:** We are proud of the UK where we have had 85% uptake of Digital Television because they are attracted to end-user benefits. Switchover will only work if it helps the consumer. The right answers for Jamaica will be developed in Jamaica.

**Further comments from the floor**

There is no perfect technology, so I would have preferred to hear from SMA about the ills of Digital Broadcasting. I would like to commend the second speaker for a level of independence and it was the first time that radio has emerged as an option for digital switchover. *(Tomlin Ellis, Kool FM)*
We have to look at the fact that normally when televisions are sent to us they would likely be from the US and we have to bear that in mind when we make our decision. *(Clifford Perkins, CVM)*

From all the seminars I’ve attend on Digital Broadcasting there has always been a concern about the standards. There is an ITU study that looks at the standards and that can assist in decision making. Secondly, in a similar conference in South Africa, there was a comment that the analogue signals cause no interference to nearby digital signals. *(Ryan James, TATT)*
2.7 Closing Remarks

Dr. Hopeton Dunn, Chairman, Broadcasting Commission.

The main conclusion out of the Workshop was a unanimous decision on the need for a broad based policy on Digital Switchover for Jamaica.

It was agreed that this policy should be forged in a consultative manner among all the stakeholders. The strategy and framework proposed by lead presenter Michael Starks will form the basis for moving forward, but the Jamaican stakeholder groups, along with government and the regulator, will determine the pace, switchover timing, standards and operational requirements for the transition.

It was proposed that the following sectors and stakeholders should be invited to constitute a National Consultative Committee for Digital Switchover, to lead in follow-up action and strategic planning:

- Broadcasting Commission - Convenor and Secretariat
- Information Division - Ministry of Information, Culture, Youth and Sports
- Cabinet Office / Office of the Prime Minister (OPM)
- Spectrum Management Authority (SMA)
- Office of Utilities Regulation (OUR)
- Media Association of Jamaica (MAJ)
- Jamaica Association of Community Cable Operators (JACCO)
- Consumer Affairs Commission (CAC)
- National Consumers League
- Representative – Equipment Suppliers
- Representative – Retailers of Radio, TV and other Appliances
- Representative – Environmental Specialists
- Representative – Public Service Broadcasting
- Representative – Content providers
- Selected Technical Specialists - e.g. signal providers, technical standards
- Regional/Global Partners (CTU/ CBU/ TATT/CTO/ ITU).

The specific purpose of the Committee would be to provide a hub for strategic planning and coordination of the national effort towards Digital Switchover. It will, among other things:
1. discuss and make proposals on the key strategic issues,
2. contribute to and review a draft policy document on Digital Switchover for Jamaica,
3. help plan a wider follow-up public consultation, and
4. review and endorse the policy recommendations to be submitted to government for policy action.

It was also agreed that the Workshop’s final report, the lead presenter’s outline presentation and copies of other Workshop presentations would be circulated electronically to all registered conference participants shortly.

Participants would also be invited to submit further comments and memoranda if they so desired.
2.8 Preliminary Adjournment

Mr. Green adjourned the session requesting evaluation forms on the Workshop and calling a small grouping to the technical session.
### 2.9 Technical Session

**Main Discussion**

The technical discussion included a heated exchange among different stakeholders with the main controversy being what would be the better standard for undertaking the transition to digital (DVB or ATSC).

- DVB was touted by its proponents (particularly a representative of DC Digital / Love TV) as a more robust and advanced technology with cheaper equipment.

- ATSC was considered better because it was the US standard and therefore the more practical decision (particularly a representative of CVM). In addition it was stated that it has not been shown to be inferior to DVB in any way.

- It appeared that some cable operators have started using DVB technology so adapting to ATSC technology would be more difficult. So it was posited that the policy should not dictate to cable operators.

- Other participants noted that the US’s position was to maintain an oligopoly position through assertion of their own standards for commercial reasons.

- These points show that the issue of the technical standard for Digital TV will be a significant point of departure to the industry players.

**Other Comments**

- On the side of the cable operators, one participant shared that the change from analogue to digital is being undertaken incrementally by members of JACCO based on systems that are being adapted from overseas.

- A CVM representative spoke to the need for a long-term strategy for switchover, having no early timeline for switchover, being mindful of high costs of television broadcasting.

- Another participant agreed that a phased approach was acceptable while still underscoring that the shift would be inevitable because we do not manufacture receiving and transmitting equipment so very soon the population will be forced to receive digital signals only. Simulcasting is a possible solution here. But if there is no date there will be no need to rush.

- Mr. Starks’ suggestion is that we begin with those persons who are completely dependent on terrestrial; if half the population has cable the change would not affect them. He also noted that the standard is an important consideration in terms of planning infrastructure. The earlier you know, the earlier you can have a planned rollout.

- A PR Campaign needs to be planned to inform consumers about getting TV sets in collaboration with the Bureau of Standards, however, the standard needs to be determined first.
○ It was queried whether a technology-neutral approach would be advisable, but that was not agreed on by the persons in attendance.
3.0 DAY 2 - Digital Switchover Policy-Briefing for Commissioners

Tuesday, March 4, 2008 – 11:00 am to 12:00 noon

3.1 Presentation on Switchover Policy

Michael Starks, Consultant

On Day 2, a policy-briefing was convened for Commissioners of the Broadcasting Commission, with the following agenda put forward by Mr. Starks:

1. Overview of the Policy
2. The Four Stages
   - Feasibility Study
   - Technical Standards
   - Digital switch on
   - Analogue Switch off
3. Stance of Government
4. Digital Switchover Workshop Review
5. Consultation and Documentation Process

Overview of the Policy

The policy would be to do switchover in stages. In the present scenario, as illustrated in Figure 1, (see below) TV stations are transmitting broadcasts via signals to a hilltop mast which then transmits the analogue terrestrial signal to the customer’s TV set via their antennas. They would also transmit their analogue signals to cable head ends via satellite which would be transmitted to the customers’ home and received through a set-top box.
Digital Switchover in television means trying to remove that form of transmission entirely and replacing it with digital. This is done for a variety of reasons, as digital television allows for:

- spectrum savings
- more robust signals and
- lower levels of power usage.

Further justification for switchover is that in the end analogue transmission will wear out and become obsolete.

The broadbrush policy is to give additional spectrum to TV stations so they can start transmitting in digital terrestrial while continuing to use analogue signals and also sending signal to cable operators (See Figure 2).
After a period of simulcasting, broadcasters would encourage dealers to buy set top boxes and encourage consumers to buy them.

Eventually, most customers will be receiving digital signals so the analogue signal would no longer be needed (See Figure 3).
FIGURE 3

Four Stages

The four stages recommended are as follows (see Figure 4):

1. **Feasibility Study:** Allows planning and thinking through the switchover process. Skipping this study may cause unexpected challenges that could be expensive and could cause delays in implementation.

2. **Technical Standards:** Selecting the family of technical standards is the next step. There is one family of standards associated with the US, another associated with Europe and a third associated with Japan. You will need to think carefully about technical and commercial criteria that are important and try to get agreement from the regulators, the industry and other stakeholders.

3. **Digital Switch On:** After steps one and two, switch on of digital terrestrial can begin. You would have to ensure that there are more services available from Digital TV; otherwise there would be no reason for the consumer to buy the equipment.
4. **Analogue Switch off:** After a period, maybe years, when most people would have moved to digital it would be possible to remove analogue signals without causing rebellion and then move into the analogue switch off stage.

**FIGURE 4**

![Four Stages of Switchover Policy](image)

**Stance of the Government**

It is important to take into account the stance of the government and the regulator in considering a Digital Switchover policy and the Minister has been brought into the picture. This meeting is also to expand on our understanding of that aspect.

**Day 1 Workshop**

The previous workshop went well because the persons who will really be investing their money for switchover were well represented, i.e. broadcasters, cable operators and consumers.

If these persons will be investing their capital though, the regulator has to be careful about its stance because it may be held legally responsible for failed endeavours. The regulator should therefore be a facilitating leader of this change in the industry but not the driving force. This would mean facilitating collaboration across the industry and facilitating its adoption of digital television for business interests.
Consultation and Documentation Process

Ultimately, getting buy-in from the industry to let it drive the process is the best way to introduce the policy. This can solve a lot of problems and will take the cost burden of the transition off the government. The regulator should consult with all stakeholders by:

- Allowing industry players to review and comment on the draft consultation document
- Consult with them on the process by which the policy is determined including whether having a Standing Committee is a good idea.

The framework for digital switchover policy used in the UK was inclusive and consultative encompassing a range of players including the Minister, the regulator, consumers, government, technical specialists, etc (see Figure 5). There were four main stakeholder groups that informed the project:

1. **Government Group:** consisting of representatives from government agencies that would be affected by switchover.

2. **Technical Group:** with high-powered expertise on the technologies.

3. **Spectrum Management Group:** which would deal with frequency planning and allocation as the transition progressed

4. **Market Preparation Group:** consisting of retailers, consumer interests and those responsible for communicating with the public on the transition.
FIGURE 5

Framework for a Consultative Approach

- Government
- Steering Board Chaired by the Minister
- Project Management Team
  - Government Group
  - Technical Group
  - Spectrum Management Group
  - Market Preparation Group
  - Stakeholder Groups (including consumer group)

These groups were informed of developments through reports and were asked for responses. All documents were made public.
3.2 Questions / Comments from the Commissioners

Questions and comments were invited from the Commissioners of which the following main issues were raised:

**Feasibility of Switchover**

**Cost / Resource Considerations**

- **On the issue of simulcasting, won’t that mean greater cost and how will those costs be borne?**

  Yes, it involves additional costs but the broadcasters have to replace equipment at some point so simulcasting would be in their interest to introduce consumers to Digital Television. They won’t want to engage in simulcasting too long because of the dual costs. So they may be keen to switch off after a while.

- **When you are offering spectrum to continue analogue and also offering spectrum for digital use, won’t there be further problems with availability of spectrum?**

  You should go over those spectrum allocation queries with the SMA. When digital signals with lower power are used, the channels they would need would be much fewer than what they are using. You would have to do the research to find out the feasibility of simulcasting in Jamaica.

- **Who paid for the feasibility study in the UK?**

  Each group paid for what was beneficial to them. The government paid for costs incurred by government and the broadcasters did as well. The Spectrum Management Group, which as it turned out was the regulator, paid for spectrum investigation.

- **Historically, broadcasting was predicated on a number of assumptions including that it is a ‘public good’ – if the broadcaster starts delivering more services as pay services, would that remove the free access to spectrum which historically they have enjoyed?**

  There is the opportunity to structure that, but the policy should ensure that consumers are not being forced to pay. There must be an attractive free television services to motivate voluntary transition.

  Also as was found in the UK, there may not be enough spending power in the market to accommodate many more pay services so that may be a high commercial risk.
Implications of Switchover

1. Implications for Cable Operators

There was an exchange on the effect of this transition on cable operators:

- **Claude Robinson:** In terms of the cable head end, would it involve investing in new equipment, because they are already taking digital signals and they will be most affected by US switchover next year?

- **Michael Starks:** Well we see that the industry has two extremes with one large cable company who has already gone digital and other small ones. You may see digital transitions taking place at a staggered rate. But that won’t prevent you from naming a date. But you should ensure you are talking to them and finding out what their problems are.

In terms of the UK, once the process kicked off in the 1990s the cable industry consolidated itself so that may happen.

- **Elaine Wallace:** Mr. Anderson suggested it would not be a problem for them …

- **Claude Robinson:** He says that he gets the digital signal and converts it to analogue so his customers can receive it. He was also hoping the cost of full conversion would come down over time.

- **Cordel Green:** A lot of them have already converted to digital at the head end. But what we find is that they only want the regulator to prescribe standards in terms of terrestrial transmission and not cable transmissions. This is because they already have arrangements for DVB equipment that are cheaper and are interoperable with the US standards.

- **Hopeton Dunn:** One of the points made was that, although we are close to the US, all our equipment does not have to come from there because DVB equipment can sometimes work across standards.

2. Implications for Business Opportunities and Competition

- **How do you think competition will play itself out, considering that some broadcasters also have cable services and there are content providers who are also cable operators?**

  Competition is healthy. Once the broadcasters begin to simulcast and will be able to offer more channels, those services will put pressure on cable.

- **What is the likelihood that movement to Digital Television would appeal to broadcasters for market segmentation, as new channels could be a source of additional revenue?**

  There would need to be a great infrastructure, that would require some investment, but it is a business option.
o Considering that the advertising pie is already small and reaching the point of saturation, more channels would cause further competition for the existing free to air stations.

Business propositions can be made to advertisers based on the introduction of new, more targeted channels.

o How open should regulators be to experimentation by broadcasters?

You should encourage this while maintaining fairness because on the whole it is a good thing.

The meeting was adjourned by Dr. Hopeton Dunn, who thanked Mr. Starks for his presentation.
4.0 DAY 2 - Digital Switchover Policy-Briefing for Policy Makers, Regulators and Academics

Tuesday, March 4, 2008 – 2:00 pm to 4:30 pm

4.1 Presentations

Welcome

*Cordel Green, Executive Director, Broadcasting Commission*

Mr. Green welcomed the gathering which would seek to investigate the complexity of issues related to Digital Switchover. The goal is to encourage thinking on these issues as a continuation of the process that began in 2003, especially in light of the urgency of the matter. He then introduced Mr. Michael Starks, an international expert on the Digital Switchover, who would share the feature presentation from the main workshop held on the previous day.

Introductory Remarks

*Dr. Hopeton Dunn, Chairman, Broadcasting Commission*

Dr. Dunn extended a welcome to participants and invited them to be actively involved in this interactive and personalized workshop. He pointed out that the Broadcasting Commission is only initiating national dialogue but not seeking to lead and direct the process. The process, he felt, can be better led by those who deliver services and products and an amalgam of other stakeholders.

The Chairman then noted that there will be many decisions to be made through consultations in determining the standards and timetable among other elements. On the previous day a range of opinions were expressed however no conclusions can be made until the round of consultations have been done. Dr. Dunn expressed his gratitude to Mr. Starks who has been helpful in the discussions and apologized for having to leave before the end of the Workshop.

Feature Presentation

*Mr. Michael Starks, Consultant*

Mr. Starks began by stating that it was great pleasure and honour for him to offer his expertise as Jamaica decides how it will approach Digital Switchover. The ensuing discussion consisted of two parts:

- Part 1: Explanation of the Issues involved in Digital Television and Switchover
Part 2: The Four Stages of Implementation

Part 1: Explanation of the Issues involved in Digital Television and Switchover

This is a repeat of the presentation made in Section 2.2.4 (detailed in Appendix IIC). The general areas covered were as follows:

1. What is Digital Television?

Digital Television codes and compresses television content into zeroes and ones making it more robust. There is a smaller risk of interference with digital signals due to lower power transmissions. More choices and interactive services are available to the consumer. Convergence is what makes this possible with the lines between telecom and broadcasting everyday becoming more blurred.

2. Why do we need a policy?

If this is something taking place across the globe, it may eventually be inevitable. It would be better to plan for it instead of letting it happen in a disorganized way. Another reason to have a policy is because you may want to get more out of the spectrum and that would need some coordination. It is still an option to do nothing and let the market take its course similarly to what happen with CDs and digital cell phones.

3. Digital Radio

In terms of Digital Radio, switchover is more difficult due the large amount of analogue sets and radio stations. Costs and benefits would add up differently from Digital Television.

4. Pioneers and Common Principles

Only three countries have completed switchover: The Netherlands, Finland and Sweden. Most advanced economies such as the UK and Japan have given 8 to 15 years and most will complete switchover by 2012. Developing countries are also pursuing the transition. These include South Africa, China, Kenya, Brazil and China.

Common principles in global examples include:

- augmenting the free to view option,
- using subsidies in a focused way (being wary of legal implications) and
- collaboration among stakeholders.
5. **Some Key Relationships**

There needs to be close technical collaboration with the two main industries involved: broadcasters and retailers. People need to get a lot of notice if they will be upgrading facilities and equipment. They need to know the standards early to order new equipment. There are some examples of subsidies and incentives but these must be done with consideration for legal implications.

Part 2: The Four Stages of Implementation

1. **Feasibility Study**

The feasibility study will provide necessary market and industry research needed for policy formulation including:

   - What the consumer proposition will be,
   - What pilots or trials need to be done, and
   - Opportunities for collaboration.

2. **Technology Selection**

A choice has to be made between the existing technical standards for Digital Television as to which one is best for Jamaica. It is important to think of the criteria that will be crucial and all relevant factors to technology selection. A formal assessment is needed to determine the best technical standards.

3. **Digital Switch on**

In the Digital Switch On stage broadcasters would be expected to start transmitting digital signals. Issues that need to be addressed would be:

   - cost for spectrum bands for digital use;
   - ‘must carry’ obligations;
   - Switch off obligations;
   - the role of subsidies

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2 The Four Stages are illustrated in Figure 4.
4. **Analogue Switch Off**

For the Analogue Switch Off stage the analogue signal would be cut off on a scheduled date. Risks and possible mitigating actions need to be assessed.

Communication with stakeholders is of extreme importance. Broadcasters need to know when they will have to switch off. The public, through consumer groups, should be aware why switch off is compulsory and the positive and negative implications of these events for them.

**Conclusion**

Every market is different but ultimately everyone involved should see the benefits and want to switch on. The first step is to assess whether a policy is needed. Further consultations will follow this event including the publishing of an explanatory paper and the notes from this meeting for public comment. The feasibility study will then inform the policy going forward.

4.2 **Questions / Comments from the floor**

**Feasibility of Switchover**

- What is the real benefit to the consumers and broadcasters in the short term?
- What additional services can be made available with Digital Television. (*Everett Miles, Fair Trading Commission*)
- What would the benefit be in a country like Jamaica where radio is the dominant medium?

**Implications of Switchover**

**Cost / Resource Implications**

- There may be an argument in Jamaica to “re-farm” the spectrum, but what happened in the UK? Is spectrum available to facilitate this transition? And who pays for the cost? (*Karlene Francis, Ministry of Mining, Energy and Telecommunications*)
Technical Implications

• Does digital switchover affect receivers? Because if it does ATSC should be chosen due to Jamaica’s proximity to the US. *(Canute James, CARIMAC)*

• Are there any consumer concerns regarding technical support? *(Lyndel McDonald, Fair Trading Commission)*

Challenges

• What are the major impediments to Switchover? *(Karlene Francis, Ministry of Mining, Energy and Telecommunications)*

• Do you find you are likely to get more public buy-in through emphasizing the economic benefits rather than the benefits to the consumers? Wouldn’t you run the risk of the public expecting you to buy them a receiver? *(Cordel Green, Broadcasting Commission)*

Execution of Switchover

• I see the time frame is getting narrower and narrower for these decisions because soon we wouldn’t be able to get the analogue equipment. *(Maurice Charvis, OUR)*

  o Follow-up: Is there a benefit to not rushing because equipment is more expensive the newer it is for both to the consumer and the broadcaster? *(Deirdre English Gosse, Broadcasting Commission)*

4.3 Summary of Responses from Mr. Starks

• The feasibility study will determine the immediate benefits that should emerge for both broadcasters and the consumer in order to have voluntary switchover by these groups. Additional services available with Digital TV would include High Definition Television (HDTV), more types of channels, and more choice. The consumer would have greater control with more interactive services.

• Regarding spectrum concerns, in the UK we left analogue broadcasters on their existing spectrum and found new frequencies for their digital transmission. The SMA gave some indications yesterday that it there are available bands, so it should be feasible technically. The bands needed would not be as large because digital signals are far more compressed allowing for up to five channels to hold within the same band that one would have held in for analogue (See Figure 6).
On the matter of preferred technical standards, formal assessment is needed. It may be worth going through a consultative process in order to get everyone on board, even if you end up with the same answer at the end. But you need to make sure your voices are heard.

As it regards consumer concerns on technical support, we know that there are a number of people who have never looked at the back of TV and would need support as to what to do with a box. The key would be in having the instructions spelt out in a manual. Also, a helpline and a support website would be useful to consumers. In terms of the quality of the product, that would have to be assessed before it reaches the consumer.

In relation to possible impediments, some industries have had bankruptcies. Also the market may stall. The key to avoiding these impediments is in making the consumer attracted to switching over.

For public buy-in you will need operational publicity because people will need to know what is happening, when and what the phases are. All of that has to be planned.

In terms of the cost, let the market do the driving. In a case like the US, vouchers have been given by the government. But it is always better when consumers and industry players switch on their own.
The US deadline is closing in and so the change should naturally arise on the end of the broadcaster. It may suit them to propose the time frame and terms of the policy and to feed their views into the consultative process.

Some of the stakeholders yesterday held the view that there was no rush in setting a deadline and in fact the penalties for getting it wrong are so high that it may be better to take time to think the process through. A balance needs to be achieved because some business interests may want to be on the cutting edge and others may want to wait.

4.4 Closing Remarks

Cordel Green, Executive Director, Broadcasting Commission

Cordel Green thanked the speaker for delivering the relevant issues in a simple manner. He reminded the participants that this is a cooperative, consultative process. Two outcomes of this workshop will be a working paper on Digital Switchover Issues and the organization of a cross-sectoral group to guide the process. He thanked participants for attending and advised them to look forward to many more meetings on the matter.