[i] Digital Broadcast Migration in West Africa: Ghana Research Report

Update on the Implementation of Digital Transition in Ghana

Internet Research, Ghana

Association for Progressive Communications (APC)
and Balancing Act

January 2011

Table of Contents

1. Introduction

Ghana's migration from analogue to digital TV broadcasting is to comply with the GE-06 Agreement to meet the 2015 deadline set by the International Telecommunication Union (ITU). This migration is the largest initiative to impact the Ghana TV broadcasting since the conversion from black and white to color TV in the 1980's. But the migration will not just be something that affects broadcasters: it will be a major undertaking for TV viewers in Ghana. In spite of the magnitude of this forthcoming migration, it has yet to be widely announced to the general public. Public awareness campaigns were planned to start from September 2010 and run to December 2014 but these are not yet visible. However, there have been a number of activities related to the initiative. As part of the Ghana Broadcasting Corporation's (GBC) 75th anniversary celebration, there was a panel discussion by experts in the field which was open to the general public (see flyer in annex 1). In June, 2010 a dedicated National Digital Broadcasting Migration Technical Committee (NDBMTC) was founded for this purpose.

2. National Digital Broadcasting Migration Technical Committee (NDBMTC)

A National Digital Broadcasting Migration Technical Committee (NDBMTC) was inaugurated by the Minister of Communications to tackle the digital migration initiative. Below are their terms of reference[1]:

- To determine the spectrum to be made available for digital broadcasting in Ghana
- To determine strategies on the use of spectrum for digital broadcasting services
- To make recommendations on spectrum pricing for digital broadcasting services
- To recommend appropriate standards for digital broadcasting services
- To identify technical issues to be addressed with neighbouring countries to ensure harmonious spectrum usage
- To consider free-to-air vs. free-access vs. subscription digital broadcasting systems
- To consider the role that satellite-broadcasting should play in the Ghanaian digital broadcasting landscape

The 24-member committee (see annex 2 for a full list of members) of technical experts has been mandated to consult widely with all stakeholders in the TV broadcasting arena and to monitor the performance of other African countries who are in the process of migration to be able to present credible and practical policy recommendations to realize the objectives of the digital broadcasting migration in Ghana.

The committee has already started a pilot project and has projected that by 2013 it would have completed covering all regional capitals and their surrounding areas. The digital pilot project is a co-

[1] SOURCE: NCA website: http://www.nca.org.gh/index.php?option=com_content

operation between GBC, NGB and Ghana's four major channels - Ghana Television, TV3, TV Africa and Net 2 Television. The committee submitted a recommendations report[2] document to the Minister of Communications on the 30th August, 2010 and once approved an official white paper will be produced.

Their implementation timetable is:

Proposed Timetable			
1	NDBMTC Final Report to Government	13/01/2010	30/06/2010
2	Development of Legal Framework (Amendment of Electronic Communications Act)	Jul 2010	Oct 2010
3	Public Awareness Campaign	Sept 2010	Dec 2010
4	Establishment of National Digital Migration implementation committee	Jan 2011	
5	Licences for Digital TV	Jan 2011	Mar 2011
6	Public Awareness Campaign	Jan 2011	Dec 2014
7	Nationwide Roll-out of Digital TV (Simulcast Period)	Apr 2011	2013
8	Coverage of all Regional Capitals & environs	By December 2012	
9	Phased analogue Switch-off	TBD according to locations and conditions	
10	Completion of Switchover	December 2014 (target date)	
11	Appraisal Report of Switchover Process	One month after completion of switchover	

TABLE 1

In addition to the various benefits of digital broadcasting and mandated timelines, one major concern for the early completion switchover is to avoid the dumping of obsolete analogue television equipment into the country from countries that complete the switchover ahead of Ghana.

Due to the sensitivity of some of the issues and magnitude of the migration task, the committee is working in a conservative manner in order to meet the deadlines with minimal issues. Hence they have agreed upon the simpler DVB-T technology which still meets the minimum requirements of the mandate until the switchover is complete and then it will possibly consider the more advanced DVB-T2. The compression standard agreed upon is the MPEG4. The current spectrum allocation is 470-862MHz. The committee continues to create the policy framework.

3. Public Broadcasting

Ghana Broadcasting Corporation (GBC) is the public broadcaster in Ghana. The basis of public broadcasting in Ghana is to: serve the public good; promote national unity and cohesion; and to promote cultural diversity and identity. The licensing fee is only about 1% of its revenue. This very low

[2] Report: Report to the government of Ghana on the migration from analogue to digital broadcasting in Ghana, National Digital Broadcasting Migration Technical Committee, August 2010 http://nca.org.gh/documents/digital_broadcasting/digital_migration_report_30_Aug_2010.pdf

licensing fee has stayed the same since the early 1990's and due to the fear of a backlash from voters most politicians are not interested in increasing this fee. Advertising is the largest revenue generating component with about 60% of the revenue. The financial contribution from Government makes up the final 39%.

The public service broadcasting is defined by the broadcaster in policy terms as the broadcasting with wide programme range covering all population segments with a nationwide reach. So far in Ghana, the broadcast coverage area and access is about 80% for TV and 100% radio for GBC. The various types of editorial coverage are international, national, development and human interest. Those outside government and the broadcaster often see the broadcasting as government-controlled.

The private broadcasters have very limited public service obligations imposed on them. They only have a few public service announcements as it is GBC that is seen to play that role as the public broadcaster. There is currently a committee[3] in place to review and enhance the broadcasting bill. The bill which is expected to be placed before Parliament early next year, would regulate broadcasting operations in Ghana

Local content of all television stations is limited. An interview with GBC staff suggested only about 20% of output is local which comprises of news, sports, a few game shows and contests, and drama. International content comprises of content from other African countries especially Nigeria (Nollywood movies) and other shows such as Big Brother Africa taking about 40% of the output. The final portion of the international content, comprise western movies, sports such as the English premier league, news programs CNN and Al-Jazeera.

English is the dominant output language on Ghana TV. The other local languages, Akan, Ga, Ewe, Nzema, and Dagbani each share an equal proportion of air time but for much smaller periods of time than for English.

The role of GBC in the digital transition would be as a pioneer in the deployment and the key station marketing the concept to the general public. It is the key instigator and implementer of the initiative since it is the leader amongst a few other broadcasters. Regarding access and coverage of TV stations in Ghana, GBC has most extensive coverage of about 80% (when all sites are up) nationwide with the other stations below 50% coverage.

In order to make the digital broadcasting process fair it is important to go with the three stage process of migration which are "switch on", "simulcast", and "switch off". There also needs to be separate licensing for broadcasters from signal distributors to create a fair and balanced process. Unlike with analog, with digital broadcasting there will be three groups in the value chain which are the broadcasters; multiplexers, who are responsible for arranging the programs and performing the compression; and the signal distributors who put down the physical infrastructure, masts etc… There can be several operators at each stage of implementation but these are determined by market forces.

---

[3] Committee to review broadcasting bill inaugurated: http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=189944

The NDBMTC organised a workshop on the concept of establishing a single signal distribution entity for broadcasting in Ghana through a Public Private Partnership (PPP) facilitated by experts from Ghana Institute of Management and Public Administration (GIMPA). GBC has been working closely with the Swedish Pay TV operator NGB to launch a digital service but the final shape of the signal carrier and services offered has not yet been finalised.

4. Access Cost

New digital TVs that conform to the technical standard and can receive DVB-T signals directly are priced at GHC1,400 (approx. US$1,000). A very limited number of the population can afford TV's at that price.

NDBMTC claims the technical standards recommended are in line with several other EMEA states and so there may be advantages of economies of scale over time that will allow a reduction in price of digitally-enabled TVs. They will still be relatively expensive for the majority of the population. So the most cost-effective alternative is the set-top box which acts as an adapter for an analog TV to receive digital broadcasts. The ability for potential audience to pay for a new digital set-top box or TV could also be a challenge at a price of GHC 140 (US$100). However, the current promotional price is GHC89 (US$63).

If the mobile phone scenario can be used as an example however, then it may be feasible if the price stays at or below the promotional price indicated above. The average price of a mobile phone is about GHC50 and its penetration within the country is quite deep. Even in rural areas where one would least expect to find phones, you will find people with mobile phones. The normal price is certainly not affordable to the general public and will pose serious problems. A suggested price of about GHC60 may be the answer. In that case a subsidy by the government of about GHC80 for the normal price and GHC29 for the promotional price is required.

In December 2010, there were 17.7 million mobile users out of an estimated population in 2010 of 24.3 million: in other words 72.9% of the population can afford the average handset price of US$50. This leaves around 6.6 million people who are unable to afford the likely cost a set top box at the price of US$50. On the basis of 6.1 persons per household, this means that there will be 1,079,603 households that cannot afford a US$50 set-top box. The cost of subsidising each of these households to buy one (at US$50 per household) would be around US$54 million. However, this number would almost certainly be reduced if Ghana assembled its own set-top boxes and did not apply import taxes to them. A target price of US$30-35 per set-top box would mean a significantly smaller number of people who would be unable to afford to make the purchase.

Also the government may regulate the features of the set-top box to the bare minimum so as to reduce the price per unit to be affordable for the wider population. However, the Committee has recommended that the government put in place fiscal measures to assist in access to set-top boxes, especially for the vulnerable in society. There are plans to set-up manufacturing plants in Ghana since estimates based upon the report to the government on the migration indicate there may be a demand for about six millions boxes. This could significantly reduce the price and create jobs at the same time.

5. Coverage

The current geographic extent of TV signal is 80% coverage of the land area and 70% of the population is covered. The uncovered areas are due to gaps caused by an uneven distribution of the transmitters. Included in the plans for the digital rollout, are future plans to extend coverage and close the gaps. A tentative schedule shows digital coverage will be completed by 2012. The ratio of public versus private sector TV broadcasting coverage is 2:1. Private firms are able to hire facilities from the state's public broadcaster. In the analog domain since everyone carries themselves there are no single independent signal carriage companies. In the case of digital there is a recommendation for two companies that will offer several independent signal carriage. GBC will own one that will be funded by the state. The next will be own privately and the arrangement is yet to be finalized. Regarding costs, the bulk of the current and future costs associated with broadcasting are going to be around equipments, links, energy, personnel, and maintenance.

It is estimated that 42 transmitters per multiplexers (MUX) are required to cover part or all of the country. A MUX costs between $200,000 and $400,000. Therefore transmission infrastructure giving 100% population coverage could cost between US$ 26,141,000 – US$ 98,390,000. However, 100% of the population do not have access to electricity so this figure is the currently theoretical maximum capital required.

One positive feature of the digital transmission is that there would not be a need to hire transmitters. The broadcaster may only have to hire a channel within a transmitter as the transmitters for digital broadcasting possess multiple channels unlike those analog which transmit only one channel.

A universal access policy equivalent for TV broadcasting is being considered. (see annex 4 for complete list of TV stations)

Next Generation Broadcasting (NGB) launched Smart TV (see annex 5 for Smart TV bouquet and subscription fees), a new digital terrestrial television service in April 2010 in collaboration with Ghana Broadcasting Corporation (GBC). Lately there have been allegations in the media[4] accusing NGB and GBC of starting a commercial pilot for digital transmission without the authorization from the NCA. It is stated that the NCA will enforce the laws against the two entities if they do not desist from the alleged illegal and controversial digital terrestrial television (DTT).

A rough estimate cost of one hour's programming by certain key types of programming (studio-based, documentary or equivalent, TV drama and film) is $1,800. The major factors contributing to these costs are equipments and personnel. The impact of new digital equipment on production costs in capital terms would be to increase costs as current analogue equipment costs will need to be depreciated. However, digital production processes may offer some modest, incremental operating cost savings.

Accurate figures are hard to come by but advertising expenditure seems to have shrunk over the last 3-5 years by around 15%. MTN and several of the other mobile networks are now the top advertisers,

[4] NCA to take on GBC and SMART TV: http://news.myjoyonline.com/business/201010/54332.asp

as well as the banking industry. There will be a willingness to put money into new channels as it arrives with the digital broadcasting. A recent report analyzing the advertising revenue in Ghana and Nigeria by MediaReach OMD claims the telecommunications sector was the highest spender in the year 2009. It spent 43.5 million Ghanaian cedis out of a total of 184.9 million cedis, and the corporate and multi-brand segment of the market came second spending 18.4 million cedi. Amongst the various media advertising channels television advertising raked in the highest revenue at 58 per cent of the total advertising spend.

The business model for new TV channels will generally be either a "pay for" or "free-to-air" approach. The extension of the number of channels will impact the range and diversity of local content by creating more local language productions and new markets. A licence on the broadcaster to provide a minimum of 60% local content on any given channel would be one good policy option that will encourage more local content.

Currently there is very limited user generated content such as blogs, you-tube videos, social networks, or any others that may involve news content in the broadcasting arena in Ghana. (see annex 6 for internet usage statistics in Ghana). However, according to statistics from August 2010, there were 621,000 Facebook users in Ghana.

There are currently no digital platforms for civil society activism since the digital platforms are still being developed. Civil society organisations are curreently only working to get a broadcasting law in place.

6. Impact of Convergence

Due to the high cost of broadband and its low availability in Ghana today, there are no triple play operators yet. The closest output to triple play available is the MTN mobile TV over DStv's DVB-H network and the Blackstar TV. Currently DStv is offering the promotional service until April 2011, so the user would only have to buy a phone requisite mobile phone with an MTN SIM card in order to watch the programs being offered for free. They will face a challenge once they start to charge a fee for viewing and so the goal is to attract a large number of users now and lock them in. Blackstar TV is currently not operational but may return to broadcasting soon. Since there is no regulatory position for those planning TV channels over broadband connections rather than transmitting, triple play will emerge soon, especially with the arrival of a number of submarine cables for broadband connections by MainOne and Glo. The key to triple play however is finding good, reasonably priced content. The Ghana Telecom (GT) experiment for instance did not flourish because Multichoice had already signed exclusive rights for most of the popular content and the remaining content was not sufficiently compelling at the price offered. Once Vodafone acquired GT and asked for new terms that were not as favorable to the Indian partner offering the content, the experiment lapsed.

7. Regulators and Regulations

Telecoms are regulated by the National Communications Authority (NCA) and TV is regulated by the National Media Commission (NMC). However NCA has overall responsibility for spectrum allocation. NMC is independent (the President only appoints[5] two of the fifteen members) under Ghana's constitution but the NCA is under the Ministry of Communications. Since telecoms and TV use frequency, they have to work together at some level to share the VHF band that will be available to them. The regulation imposed on spectrum is common to both NMC and NCA although they each have separate content regulators. Government is only involved through the regulatory bodies and regulations.

Below are the legal frameworks covering both areas:

- NCA Act 2008, Act 769
- The Electronic Communications Act of Ghana, Act 775 of 2008
- National Media Commission Act 1993 (Act 449)
- National Liberation Council Decree 226 (NLCD 266) of 1968

8. Public Interest Media

Because of digital technology, there will be an increase in available TV channels. GBC will have a minimum of 30 openings for new channels that may be licensed to current or new TV stations. The GBC staff noted that there are already a number of parties who have expressed interest in the new channels. This will result in the arrival of more diverse channels such as drama, sports etc. and it will affect the public TV broadcaster with respect to viewer segmentation, particularly amongst the youth demographic . For example with the entry of Viasat and its entertainment programming, a large number of the 15-25 age groups was lost from the already established stations. It may cause a reduction in advertising to particular stations because the expenditure on a single station may reduce, and there will be new ways of reaching audience. But there will certainly be new opportunities to change the way television operates.

9. Spectrum and Digital Gate-Keeping

The potential spectrum re-allocation will certainly be a breath of fresh air for NCA which has suffered from spectrum shortage. Digital technology will free up a lot more spectrum. All of the VHF that is currently being used will be freed up, and part of the UHF will also be freed up. At this stage it is difficult to determine what categories of users, groups, and institutions will be favored by spectrum

---

5 Ghana Constitution. Chapter 12 Article 166 - Freedom and Independence of the Media: **http://www.parliament.gh/chapter_twelve_-_freedom_and_independence_media.html**

allocation policy e.g. low spectrum usage fees, privileges in broadcast licensing, distribution of white spaces and digital dividend. Certainly the lowest allocation will be to community broadcasting.

To date there have been no reports of operators trying to reduce spectrum availability for potential rivals or efforts to obtain control and management of digital multiplexes. It is yet to be determined how the digital dividend is going to be reallocated. The NCA and the relevant stakeholders have yet to work out the full extent of the digital dividend. It is also yet to be determined if it will be awarded in a transparent way, on the basis of calculated costs or benefits, or not.

The debates in public and the media about the adoption of technical standards have ended. There are however national committee debates going on internally to highlight any potential problems that the adoption of such standards may pose for media reception and consumption. There have not been any problems related to the gatekeepers in digital broadcasting. No companies are bundling a large number of TV channels and running subscription management systems. There are no limitations of access, exclusion of channels from TV menus, etc... For a small country like Ghana it makes economic sense to have an ownership of the one signal transmitter for the distribution of spectrum resources. Fewer resources are spent on the transmitter and there will be a less number of masts in the communities. The role to be played by public interest in the allocation and regulation of white spaces and the digital dividend is yet to be determined.

10. Issues

One thing all stakeholders (government, regulator, broadcasters, journalists, civil society) agree on and are worried by is the lack of local content. As mentioned above only 20% of the total content is local. This is due to the high cost of production and low quantity of good content. With the arrival of digital and the large numbers of TV stations it will bring, there could be a further influx of cheap international content flooding Ghana’s TV screens.

Again, as mentioned above the cost of migration to digital for the masses is another major issue of concern. In Ghana today, there are still some areas with black and white TV sets because they cannot afford to get color TV sets. It will take a large number of the population a very long time to buy digital TV sets or set-top boxes. Even used sets are currently quite expensive. Unlike during the Black and White to color transition when there was no deadline to move, this migration will have a fixed date or you will have no TV reception and this could cause uproar if not managed carefully.

The issue of cost is closely related to the timeline for the migration process. The longer the transition process, the greater the likelihood that set-top boxes and TVs will sell in volume and prices will come down. The committee currently has set an aggressive date in 2013 for final switch over. The original date was in 2012 and that was postponed. There is a chance this 2013 may be pushed further back to lengthen the simulcast period, so the public gets more time to convert their units. This simulcast however is costly to the government as both types of output have to be transmitted at the same time.

Funding for all of the expenses to be incurred by the government is an issue. The total costs for the transmission infrastructure is estimated to be in the range between US$25 million to US$100 million.

This cost is in line with some of the other costs for projects in other industries in the country. The Israeli government for instance recently provided a concessionary loan of a hundred million dollars for water projects in Ghana. The presidential palace – (Flagstaff House) is estimated to have cost almost two hundred million dollars for a loan from India. There are discussions in place for a Japanese Government Soft Loan as some for this digital migration for the equipment to be used which may be bought only from Japan.

9. Conclusions

Ghana is making modest but focused strides towards completing the digital migration process. The committee that has been set up is serious and has so far been on schedule.

However, the general public is yet to be informed of the migration which if well delivered may pass off without problem. The committee plans a 3 month communication campaign covering adverts on TV and Radio; billboards; press releases, media interviews, stories, features and documentaries; seminars; community outreach events to inform the public of the migration; however the plan is yet to be approved by the Ministry. GBC has on its own already commenced sensitization efforts and started on Monday, October 4th 2010 to discuss the issue as part of its regular adult education program. As indicated in annex one digital migration was a topic during the 75 anniversary celebration events at GBC and thus the public is being made aware of the issue very gradually gradually.

A number of TV viewers in the urban areas already have the LED, LCD and Plasma TV's that are digital-enabled. A large number of TV viewers also rely on TV screens in bars or hotels, TV sets displayed along the road sides, movie houses and TVs provided at the work place. These groups may also not be as affected. The remaining groups will be the hardest affected. They will be forced to either buy new sets, or keep their old sets and buy a set-top box. Depending on the price of these new sets and the set-top boxes this migration may or may not make it successfully.

10. Appendix 1: GBC@75 Panel Discussion - Digital Migration – Programme

Acknowledgement

The GBC@75 Planning Committee, Board of Directors, the Management and staff of GBC humbly express their sincere gratitude to you all for honouring this occasion. May the Lord bless you all.

MMRS Tel: 0302-226631

GBC@75
PANEL DISCUSSION

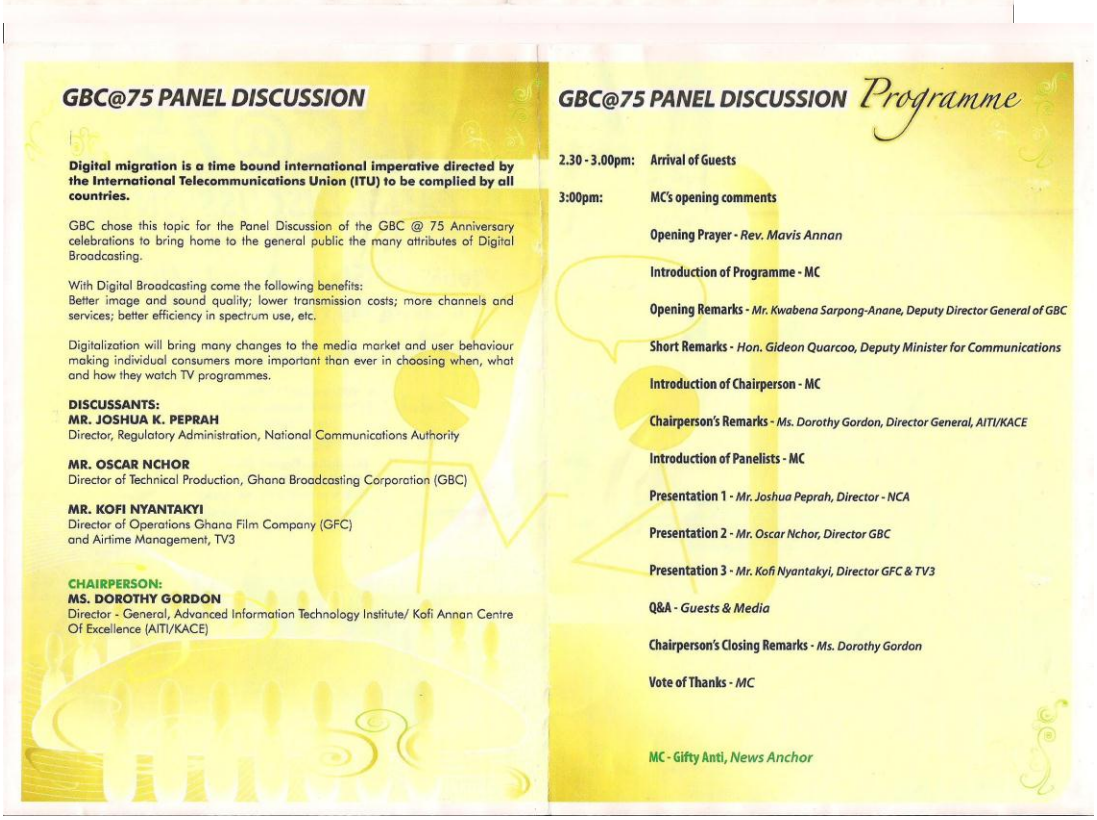
Topic: DIGITAL MIGRATION:
The Changing Face of Broadcasting

Theme: The National Broadcaster - Agent for Development.

Date: Wednesday 11th August, 2010
Venue: GTV Studio 1, Broadcasting House, Accra
Time: 3.00pm

Panelists
Mr. Joshua Peprah (NCA)
Mr. Oscar Nchor (GBC)
Mr. Kofi Nyantakyi (TV3/GAMA)
Chairperson: Ms. Dorothy Gordon, Director-General, AITI/KACE

75TH
GHANA BROADCASTING CORPORATION
1935-2010
ANNIVERSARY



GBC@75 PANEL DISCUSSION

Digital migration is a time bound international imperative directed by the International Telecommunications Union (ITU) to be complied by all countries.

GBC chose this topic for the Panel Discussion of the GBC @ 75 Anniversary celebrations to bring home to the general public the many attributes of Digital Broadcasting.

With Digital Broadcasting come the following benefits:
Better image and sound quality; lower transmission costs; more channels and services; better efficiency in spectrum use, etc.

Digitalization will bring many changes to the media market and user behaviour making individual consumers more important than ever in choosing when, what and how they watch TV programmes.

DISCUSSANTS:
MR. JOSHUA K. PEPRAH
Director, Regulatory Administration, National Communications Authority

MR. OSCAR NCHOR
Director of Technical Production, Ghana Broadcasting Corporation (GBC)

MR. KOFI NYANTAKYI
Director of Operations Ghana Film Company (GFC)
and Airtime Management, TV3

CHAIRPERSON:
MS. DOROTHY GORDON
Director - General, Advanced Information Technology Institute/ Kofi Annan Centre Of Excellence (AITI/KACE)

GBC@75 PANEL DISCUSSION *Programme*

2.30 - 3.00pm: **Arrival of Guests**

3:00pm: **MC's opening comments**

Opening Prayer - *Rev. Mavis Annan*

Introduction of Programme - MC

Opening Remarks - *Mr. Kwabena Sarpong-Anane, Deputy Director General of GBC*

Short Remarks - *Hon. Gideon Quarcoo, Deputy Minister for Communications*

Introduction of Chairperson - MC

Chairperson's Remarks - *Ms. Dorothy Gordon, Director General, AITI/KACE*

Introduction of Panelists - MC

Presentation 1 - *Mr. Joshua Peprah, Director - NCA*

Presentation 2 - *Mr. Oscar Nchor, Director GBC*

Presentation 3 - *Mr. Kofi Nyantakyi, Director GFC & TV3*

Q&A - *Guests & Media*

Chairperson's Closing Remarks - *Ms. Dorothy Gordon*

Vote of Thanks - *MC*

MC - Gifty Anti, *News Anchor*

11. Appendix 2 - NDBMTC Members

A Full list of the National Digital Broadcasting Migration Technical Committee[6]

Name	Organization	Position
Mr Joshua Peprah	National Communications Authority (NCA)	Director, Regulatory Administration
Maj. Emmanuel Owusu-Adansi (Rtd)	NCA	Director, Special Projects
Mr Henry Kanor	NCA	Ag. Director, Engineering
Mr Edmund Yirenkyi Fianko	NCA	Assist. Manager, Engineering
Mrs Hawa Yakubu	Ministry of Communications (MoC)	
Mr Kennedy Osei	MoC	
Mr Issah Yahaya	MoC	Director, PPME
Mr Emmanuel Ofori	MoC	Asst. Director, PPME
Mr G.B.L. Silo	Ministry of Information (MoI)	Director, Finance & Admin.
Ms Yvonne Quansah	Ministry of Finance and Economic Planning (MoFEP)	Director, Aid and Debt Management Division
Ms Elizabeth Anane	Ministry of Trade and Industry (MoTI)	Industrial Promotions Officer, SMS & Technology Division
Mr Emmanuel Adisi	MoTI	
Mr Augustus Ken Kweku Eshun	Ministry of Environment, Science and Technology (MoES&T)	
Mr Anim-Abdul Rahaman	Ministry of Local Government & Rural Development (MoLG&RD)	Deputy Director
Mr Alexander Bannerman	National Media Commission (NMC)	
Mr Oscar Nchor	Ghana Broadcasting Corp. (GBC)	Director of Technical Production
Ing. Dr Adam Icarus Imoro	Ghana Institution of Engineers (GhIE)	
Messrs Ekow Ansah	TV AFRICA	
Kofi Nyantakyi	TV3	Director of Operations Ghana Film Company (GFC), and Airtime Management
Chief Crystal Adjirakor	Ghana Independent Broadcasters Association (GIBA)	
Mr John Agbosege Chief Collector	Customs Excise and Preventive Services (CEPS)	Asst. Commissioner, IT
Mr Kwesi Baiden	Ghana Standards Board (GSB)	Engineer
Mr Ebenezer Appah Sampong	Environmental Protection Agency (EPA)	Director, Environmental Assessment and Audit Department
Dr Prosper Ashilievi	Ghana Telecom University College	Dean Faculty

[6] SOURCE: NCA Website http://www.nca.org.gh/index.php?option=com_content&view=article&id=185:inaugration&catid=99:press-release&Itemid=29

	(GTUC)	
Dr Kwasi Diawuo	Kwame Nkrumah University of Science and Technology (KNUST)	Dean Faculty of Computer and Electrical/Electronic Engineering
Mr Stanley Opoku	National Film and Television Institute (NAFTI)	Senior Technician
Mr Francis K. Boakye	University of Ghana (UG)	Deputy Director, ICT

12. Appendix 3 -Country Background data

Indicator	2004	2005	2006	2007	2008	description
Daily newspapers (per 1,000 people)	-	-	-	-	-	Daily newspapers refer to those published at least four times a week and calculated as average circulation (or copies printed) per 1,000 people. Source: United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics.
Electric power consumption (kWh per capita)	235.45	260.78	311.92	259.46	-	Electric power consumption measures the production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants. Source: International Energy Agency, Energy Statistics and Balances of Non-OECD Countries and Energy Statistics of OECD Countries.
Employment to population ratio, 15+, total (%)	65.7	65.5	65.2	65.2	65.2	Employment to population ratio is the proportion of a country's population that is employed. Ages 15 and older are generally considered the working-age population. Source: International Labour Organization, Key Indicators of the Labour Market database.
Fixed broadband Internet subscribers (per 100 people)	0	0.01	0.06	0.07	0.1	Fixed broadband subscribers are users of the Internet who subscribe to paid high-speed access to the public Internet. High-speed access is at least 256 kilobits per second in one or both directions. Source: ITU, World Telecommunication Development Report and database, and World Bank estimates. Note: Please cite the International Telecommunication Union for third-party use of these data.
GDP (current US$)	8,871,872,035.00	10,720,345,993.00	12,722,374,700.00	14,942,404,255.00	16,653,350,978.00	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used. Source: WB national accounts data, and OECD National Accounts data files.
GDP growth (annual %)	5.6	5.9	6.4	5.7	7.3	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Source: World Bank national accounts data, and OECD National Accounts data files.
GDP per capita (current US$)	413.89	489.17	568.13	653.34	713.18	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Source: World Bank national accounts data, and OECD National Accounts data files.

Inflation, GDP deflator (annual %)	14.35	14.96	12.79	13.85	16.9	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. Source: World Bank national accounts data, and OECD National Accounts data files.
International Internet bandwidth (bits per person)	-	7.67	14.74	21.73	86.29	International Internet bandwidth is the contracted capacity of international connections between countries for transmitting Internet traffic. Source: International Telecommunication Union, World Telecommunication Development Report and database, and World Bank estimates. Note: Please cite the International Telecommunication Union for third-party use of these data.
International voice traffic (minutes per person)	-	20.66	-	0.98	5.99	International voice traffic is the sum of international incoming and outgoing telephone traffic (in minutes). Source: International Telecommunication Union, World Telecommunication Development Report and database, and World Bank estimates. Note: Please cite the International Telecommunication Union for third-party use of these data.
Internet users	368,000.00	401,310.00	609,810.00	880,000.00	997,000.00	Internet users are people with access to the worldwide network. Source: International Telecommunication Union, World Telecommunication Development Report and database. Note: Please cite the International Telecommunication Union for third-party use of these data.
Internet users (per 100 people)	1.72	1.83	2.72	3.85	4.27	Internet users are people with access to the worldwide network. Source: International Telecommunication Union, World Telecommunication Development Report and database, and World Bank estimates. Note: Please cite the International Telecommunication Union for third-party use of these data.
Personal computers (per 100 people)	0.52	0.58	-	-	1.07	Personal computers are self-contained computers designed to be used by a single individual. Source: International Telecommunication Union, World Telecommunication Development Report and database, and World Bank estimates. Note: Please cite the International Telecommunication Union for third-party use of these data.
Secure Internet servers (per 1 million people)	0.05	0.14	0.31	0.44	0.69	Secure servers are servers using encryption technology in Internet transactions. Source: Netcraft (http://www.netcraft.com/) and World Bank population estimates.
Telecommunications revenue (% GDP)	-	-	-	-	-	Telecommunications revenue is the revenue from the provision of telecommunications services such as fixed-line, mobile, and data. Source: International Telecommunication Union, World Telecommunication Development Report and database, and World Bank estimates. Note: Please cite the International Telecommunication Union for third-party use of these data.
Urban population	10,083,144.89	10,475,450.30	10,869,726.27	11,270,812.04	11,680,133.69	Urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects. Source: World Bank Staff estimates based on United Nations, World Urbanization Prospects.
Urban population (% of total)	47.04	47.8	48.54	49.28	50.02	Urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects. Source: United Nations, World Urbanization Prospects.

13. Appendix 4 – TV Stations in Ghana

No.	Name and Address of Company	Brand Name	Type of Service	Area(s) of Operation	Date of First Authorisation	Date of Commencement of Service
1	Ghana Broadcasting Corporation (GBC)	GTV	Free To Air Terrestrial	Nationwide	Established by GBC Decree of 1968	31-Jul-65
2	TV3 Network Limited	TV3	Free To Air Terrestrial	Greater Accra	17-Sep-96	17-Sep-97
				Eastern		
				Western		
				Central		
				Ashanti		
				Brong Ahafo		
3	Metropolitan Entertainment Television	Metro TV	Free To Air Terrestrial	Nationwide (All ten regional capitals)	05-Sep-97	04-Aug-98
4	Television Africa Ltd.	TV Africa	Free To Air Terrestrial	Greater Accra	21-Nov-95	2003
				Eastern		
				Central		
				Western		
				Ashanti		
5	Crystal Radiovision Network Ltd.	Crystal TV	Free To Air Terrestrial	Greater Accra		
				Eastern		
6	Multichoice Ghana	DSTV	Pay TV	Nationwide	14-Apr-00	26-May-99
			Digital Satellite (Ku)			
		DSTV Mobile	Mobile TV (DVB-H)	Accra		
7	CATV Limited	Cable Gold	Pay TV	Accra / Tema		
			Cable			
			DVB-T			
8	Net 2 TV Limited	Net 2 TV	Free To Air Terrestrial	Greater Accra	07-Apr-04	
				Eastern		
9	Wilsad Support Promotion Services	Skyy Digital	Pay TV DVB-T	Greater Accra	23-Apr-04	
				Eastern		
				Western		
				Ashanti		
10	Independent TV Limited	N/A	Free To Air Terrestrial	Not yet on air	01-Apr-08	Not yet on air
11	K & N Investments Limited	e-TV Ghana	Free To Air Terrestrial	Greater Accra	19-Oct-06	
				Eastern		
12	Multimedia Broadcasting Company Ltd.	Multi TV	Free To View Digital Satellite	Nationwide		

13	Viasat Broadcasting Ltd.	Viasat 1	Free To Air Terrestrial	Greater Accra Eastern Central Western Ashanti	22-Feb-08	
14	Three Angels Broadcasting Network (3ABN) Ghana	N/A	Free To Air	Not yet on air	11-Aug	Not yet on air
15	Black Star Television	Fon TV	Mobile TV (TDMB)	Greater Accra Ashanti		
16	Integrated Media Xchange (IMX)	N/A	Free To Air Terrestrial	Not yet on air		Not yet on air
17	Multiple Concepts	N/A	Free To Air Terrestrial	Not yet on air	05-Jan-09	Not yet on air
18	Smart Multimedia	N/A	Free To Air Terrestrial	Not yet on air	23-Dec-08	Not yet on air
19	The Cardinal Foundation for Distance Learning	N/A	MMDS frequencies retrieved	Not yet on air	11-Feb-05	Not yet on air
20	Centre for Intercultural Learning Talent & Development, AGORO	Coastal TV	Free To Air Terrestrial	Cape Coast	16-Oct-07	
21	Great KOSA Company Ltd.	N/A	Educational/Research station	Gomoa Mpota	27-Aug-08	Not yet on air
22	Empire Broadcasting Network	N/A	Free To Air Terrestrial		23-Dec-08	Not yet on air

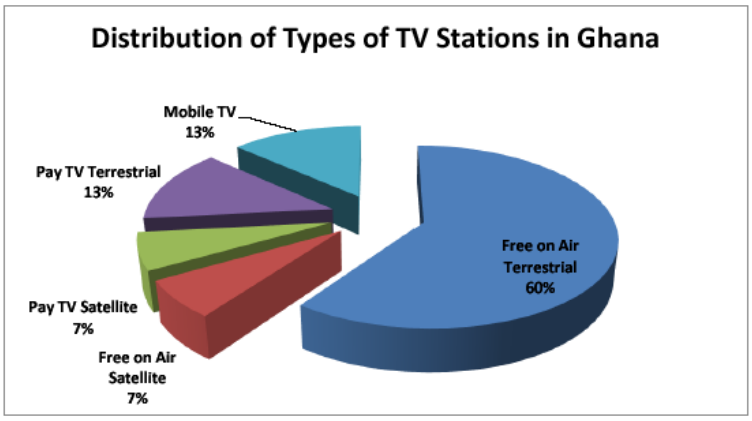


Figure5- 3: Distribution of Types of TV Stations in Ghana (Data from NCA, 31 Dec 2009)

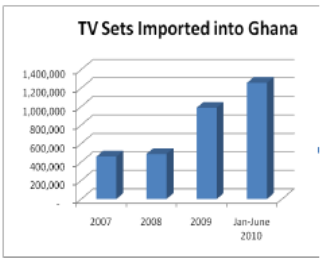


Figure 5-4 Imports of Television sets into Ghana (Data provided by Ministry of Trade and Industry)

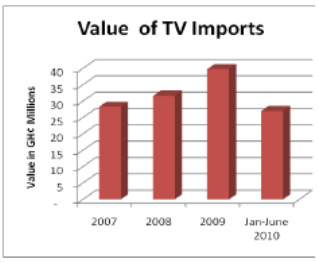


Figure 5-5 Imports of Television sets into Ghana (Data provided by Ministry of Trade and Industry)

Culled from: Report to the government of Ghana on the migration from analogue to digital broadcasting in Ghana, National Digital Broadcasting Migration Technical Committee, August 2010

14. Appendix 5 – Smart TV Bouquets and Subscription Fees

Smart TV Full package
Including: Decoder, antenna and programme card
Customers will have to sign an agreement to pay 12 monthly subscription
Price: GHC 149 (US$100)

Smart TV Standard package
(Will only be sold by Smart TV, it cannot be bought via the dealer.)
Including: Decoder, antenna
Price: GHC 173 (US$120)

SMART TV Subscription
1 Month Top up voucher – GHC 19 (US$13)
3 months Top up voucher – GHC 50 (US$35)

Smart TV Bouquet
Your Smart TV single bouquet offers you a Smart mix of exciting local and international content for the entire family.
Pay channels

Fox Entertainment is one of the biggest names in entertainment. FOX provides viewers with quality entertainment and brings to the screens highly rated dramas, comedies, crime, sci-fi and action series, as well as movies.

SHOWTIME is the toughest film channel on the market. Showtime is an extravaganza of excitement and high adrenaline action 24 hours a day, Seven days a week. With films from the major Hollywood studios, Showtime offers viewers the last decade's greatest action classics. Showtime also presents loads of unique action filled themes, as well as honours the great action heroes of the big screen.

Hi Nolly showcases the very best of Nollywood, featuring the most current movies, series and the latest gossip from the stars.

Homebase thrills you with handpicked entertainment package from the Ghanaian movie and entertainment industry. Programming on Homebase caters to the entire household with a mix of movies, series, comedies, chat shows and live studio programmes in Local Ghanaian Languages.

Africa Sports Network has a unique blend of both foreign and local sports content. You will be trilled each day by having the chance to watch LIVE football games from SIX leagues in the world – the English Premier League, the Italian Serie A, the Scottish League, the Belgian Jupiter league, the J-league and the Major League Soccer (MLS) plus LIVE NBA games for our basketball lovers. Arsenal fans will have the opportunity to watch Arsenal TV and Kotoko TV are exclusively on ASN Sports.

Setanta Sports brings to viewers live matches from some World's best football leagues and other sports like boxing, athletics, TNA Wrestling etc. Sports programmes are tailored to meet the taste of all age groups. It also brings on your screens renowned sports analysts who digest various aspects of the live matches.

BBC World News, the world's largest broadcast news operation, focuses on international news, features and analysis from Africa, Americas, South Asia, Asia-Pacific, Europe and the Middle East. The BBC's 24-hour news and information service is available on TV, online and mobile. It provides breaking news, as well as broader news stories, plus award-winning current affairs series and documentaries.

GOD TV is a unique and innovative Christian international channel that offers new phase of international Christian programmes including conferences, interviews, music shows and features prominent Christian leaders/preachers from around the world. It also has a dedicated feed which gives space to African preachers.

Kiss showcases music videos from popular urban, hip-hop and R&B artists. It will keep you dancing all night long.

KidsCo is loaded with the best adventures, great stories, funky toons and movies, that even mummies and daddies will enjoy. It provides family friendly programming to satisfy kids in preschool up to age 12 years.

STAR! is glamour, fashion and gala shows. Star! is the entertainment channel that brings you revealing documentaries, interviews with the hottest stars and live broadcasts of the most glamorous awards ceremonies and star-studded events like the Golden Globe Awards, the Grammy Awards, the Emmy Awards and much more. Fashion Television features cutting-edge fashion from Paris, Milan and New York. Star! is 24 hours a day, seven days a week entertainment.

Silver is the destination for all those who look for the best in quality cinema. Silver is presenting award winning films from all over the world, films that dare to challenge, entertain and push the limits. You will meet the trend setters within modern cinema – from American Independents to the best from Europe, Asia and exciting film producing markets all over the world. Silver broadcasts 24 hours, 7 days a week. All films have subtitles and are free from commercial breaks.

Al Jazeera English is the world's first English-language news channel to be broadcast across the globe from the Middle East. Al Jazeera English provides audiences with an alternative perspective on global affairs, putting human stories at the centre of the news agenda and bringing unreported stories from across the world to light.

Free to Air

Coming soon (Pay channels)

15. Appendix 6 – Internet and Facebook usage statistics in Ghana

GHANA
Population: 24,339,838 (2010)
Country Area: 238,538 sq km
Capital City: Accra - population 2,280,216 (2008)

Ghana Internet Usage and Population Growth:

YEAR	Users	Population	% Pen.	Usage Source
2000	30,000	18,881,600	0.2 %	ITU
2006	401,300	21,801,662	1.8 %	ITU
2008	880,000	23,382,848	3.8 %	ITU
2009	997,000	23,887,812	4.2 %	ITU
2010	1,297,000	24,339,838	5.3 %	ITU

SOURCE: INTERNET USAGE STATISTICS FOR AFRICA
http://internetworldstats.com/stats1.htm

FACEBOOK

COUNTRY	Total users as of 3/1/2010	New Users in February	Monthly Growth Rate
Morocco	1,385,240	98,420	7.6%
Tunisia	1,208,660	85,940	7.7%
Nigeria	1,066,260	60,700	6.0%
South Africa	2,442,280	37,080	1.5%
Ghana	**374,100**	**32,900**	**9.6%**
Kenya	579,220	13,300	2.4%

SOURCE: Insidefacebook.com
http://www.insidefacebook.com/2010/03/18/africa-is-slowly-but-steadily-adding-facebook-users/

Note: per Internetworldstats.com - 621,000 Facebook users as of August 31/10, 2.6% penetration rate.

16. Further References

Interviews

Mr Oscar Nchor, Ghana Broadcasting Corporation (GBC), Director of Technical Production

Mr Edmund Yirenkyi Fianko, National Communications Authority (NCA), Assistant Manager, Engineering

Mr Issah Yahaya, Ministry of Communications (MoC), Director, PPME

Mr Kwesi Baiden, Ghana Standards Board (GSB), Engineer

Mr. Michael Agyekum, GTV, Production Manager

Mr. James Ampem Darko, GBC, Technical Trainer

Mr. Praveen Sadalage, BusyInternet, Managing Director

Publications

Ghana to implement digital migration by 2013, General News Agency, Friday, 7 May 2010
Mr. Edmund Yirenkyi Fianko, Secretary of NDBMTC
http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=181615

Technical Committee on digital broadcasting presents report, General News Agency, Monday, 30 August 2010
http://www.ghana.gov.gh/index.php?option=com_content&view=article&id=3180:report-on-digital-broadcasting-ready-&catid=28:general-news&Itemid=162

Migration from Analogue to Digital Broadcasting in Ghana – a primer, Monday, 3 May 2010, 17:24 GMT
National Digital Broadcasting Migration Technical Committee
http://news.myjoyonline.com/features/201005/45552.asp

Migrating from Analogue to Digital TV, February 2010, Business Times Africa Evans Boah-mensah
http://businesstimesafrica.net/bt_subcat_linkdetails.cfm?prodcatID=6&tblNewsCatID=36&tblNewsID=252

Smart TV global deregulation in the telecommunications digital migration

http://www.facebook.com/topic.php?uid=139042156115323&topic=112

SMART TV, Ghana's latest digital terrestrial television service launches, Written by Oluniyi David Ajao on 30 April 2010
http://www.davidajao.com/blog/2010/04/30/smart-tv-ghanas-latest-digital-terrestrial-television-service-launches/

Report to the government of Ghana on the migration from analogue to digital broadcasting in Ghana, National Digital Broadcasting Migration Technical Committee, August 2010
http://nca.org.gh/documents/digital_broadcasting/digital_migration_report_30_Aug_2010.pdf

Advertising Spending: Telecoms Tops In Nigeria And, Ghana, 24-Jun-2010
http://business.peacefmonline.com/news/201006/51092.php

[i] *African countries are committed to migrating to digital broadcasting by June 2015. This will be a costly process (both for Government and citizens) and it is currently unclear who will benefit from it or where the resources needed to make the transition will come from. Arguably it is one of the most fundamental changes in African broadcasting for over a decade and raises wider questions about how the "public interest" is expressed in broadcasting and its relationship with interactive, converged media. However, only a minority of African countries have started the policy work needed to create the transition and most of the discussion is focused on technical questions.*

APC and Balancing Act's «Digital Broadcast Migration in West Africa » project aims to provide information about the transition to digital broadcasting in Africa and looks the costs, potential benefits and policy issues. The project has a particular focus on Ghana, Nigeria and Senegal and has been possible thanks to support from Open Society Institute (OSI).

For more information http://digmig.apc.org/