

Guidelines for ASEAN Digital Switch-Over

Introduction to the Guidelines

The migration from analogue to digital TV broadcasting services is a complex process, involving decisions on the regulator/government, service providers, network operators, consumer and electronics manufacturers. Regulatory frameworks, service offerings and network configurations are likely to be different from country to country, taking into account national (political) priorities, market circumstances, geography and population distribution.

Independent of national variations, experience in countries who have successfully switched-over has shown that it is essential to meet a number of conditions to achieve a successful transition to digital broadcasting services, including:

- Strong leadership from government;
- Firm decision that sets the analogue TV switch-off date;
- Close cooperation between regulator and market parties;
- Clear and timely regulatory framework (including decisions on the “Digital Dividend”);
- Adequate information and education to viewers.

The objective of the guidelines is to assist the ASEAN Member States in making their own roadmap to switch-over from analogue to Digital Terrestrial Television Broadcasting (DTTB). The guidelines are based on a functional framework consisting of 4 areas:

1. Policy and regulation (Government led);
2. Network operators (Broadcasters)
3. Public awareness (Government led, in association with industry)
4. Market and business development (Industry);

The Guidelines is drafted by the Specialist Work Group on Policy of the ASEAN Digital Broadcasting (ADB).

1 POLICY AND REGULATION (GOVERNMENT LED)

This section provides an overview of the key issues and choices for the Government when formulating Switch-Over Plan.

1.1 Legal and Regulatory Framework

The government must specify the legal and regulatory framework to regulate DTT services. This includes a review of whether it is necessary to adapt existing broadcasting legislation and decisions on:

- *the licencing model for DTT services (eg whether to licence DTT multiplexes separately from DTT services);*
- *the length of the DTT licences;*
- *regulation of interactive services such as Electronic Programme Guide (EPGs), Electronic Programme Information Guide (EPIGs), Programme Associated Data (PAD), Non-Programmes Associated Data (NPAD);*
- *regulations on the use of multiplex capacity for video and/or data services;*
- *structural or operational separation (if any) between infrastructure and service providers*

1.2 Business Model / Market Structure

1.2.1 The government must decide whether it will determine the number of players and type of DTT services (FTA or Pay TV, SD or HDTV)(or leave this to market forces)and the method of allocating new licences (if any).

1.2.2 The Government to establish the new market structure and business model for DTT services, if any, with the aim of improving and enhancing current business models of Broadcasters and Content Providers. For e.g governments may choose to implement DTT using a Common Infrastructure Approach, which would provide huge savings in terms of capital expenditure by the Broadcasters.

1.2.3 The Government to decide on new modes of DTT service roll out which may involve regional and state players and if so, how many entrants shall be allowed in the market.

1.2.4 The Government to decide on the methodology to implement DTT services whether involving a private or public sector initiative and the mechanism to be used for DTT service roll out which may consist of a Regulatory Approach or any other Government approach as deemed relevant and feasible.

1.2.5 The Government to decide on whether the FTA Digital Service will be allowed any form of pay TV services and the quantum and ratio between FTA and pay TV service to be determined.

1.2.6 Should a private sector initiative be adopted by the Country, the Government to decide on the identity and shareholders of the private company whereby the interest of the Government may need to be given due consideration given the strategic, highly secured and critical platform of DTT.

1.2.7 In the same scenario as above, the Government to also decide on the percentage shareholding of any foreign

participation of the private sector company which shall be in line with the National Economic Policy of the country.

1.2.8 Government to decide whether there is a need to regulate the price of digital sub-channels which are leased by mux operators

1.3 Digital Take-Up Rate & Timeline

1.3.1 ASO Plan

1.3.1.1 The government need to chart a national Analogue Switch-Off (ASO) plan which includes:

- Outlining the ASO plan: when and where to begin the process and how long the entire operation should last; to decide when to make the public announcement on ASO
- Overall ASO planning set-up: including the overall program structure and the key result paths in a an ASO plan;
- ASO planning phases and milestone

1.3.1.2 The government must decide whether to peg ASO to a percentage of digital take-up (eg 85%, 90% or 100% of country's population) and if so, within what specific timeframe before ASO (ie how many years ahead of ASO must the desired digital take-up rate be achieved).

1.3.1.3 The government must consider whether to conduct an annual survey to track digital take-up to aid in the assessment of whether the country is on track to achieving its timelines. This also serves as a proxy to measure the effectiveness of the public education messages.

1.3.2 The Introduction of DTT services

In this phase of the planning the DTT network will be rolled-out (in the region) and digital transmitters will be installed in either existing or new sites. It is important that in this phase of the planning:

1.3.2.1 The National Spectrum Plan should be updated and the DTT licensing should be completed;

1.3.2.2 No further analogue terrestrial television frequency licences should be issued and possibly existing analogue television licences should be revised (to make it possible to terminate the licence);

1.3.2.3 Existing broadcasting laws and regulations have been reviewed to ensure that they reflect the implications of digital TV transmissions;

1.3.2.4 Current analogue broadcasters are being informed that they will be allowed to continue with analogue transmissions up to analogue broadcasting switch-off date;

1.3.2.5 The start up phase of digital broadcasting will be closely monitored in terms of coverage, reception quality and interference.

1.3.3 Simulcasting

- 1.3.3.1 During the simulcast period and the preparation of the Analogue Switch-Off (ASO), the government must ensure the viewers in the affected region, are being actively informed about the switch-off date.
- 1.3.3.2 The government should set an indicative schedule for switch-over in order to create momentum and coordinate expectations of market players, including details of how switch-over will be implemented in phases and in regional basis.
- 1.3.3.3 It is important that in this phase:
- Receivers are available and distributed in the right amounts and locations;
 - Postcode or address 'checker' (for affected viewers to check if they are affected and possible type of receiver) and websites are tested and operational;
 - Contact centres are tested and ready to be operational;
 - In case of financial compensation and installation aid, the logistics chains for these services are tested and operational;
 - Broadcasters will include in their programming ASO information and actively promote switch-over to digital
- 1.3.3.4 The Government to monitor and conduct field measurements and take relevant necessary steps to minimise and ensure no harmful interference to DTT or analogue services during the simulcast period.
- 1.3.3.5 The Government to describe the scenario how to implement DTT if the frequencies allocated for digital in certain areas are still being used for analogue transmission

1.3.4 Analogue Switch-Off (ASO)

- 1.3.4.1 This stage will involve the switching off of all analogue terrestrial broadcasts in the region. Ideally before analogue switch-off all affected viewers should have acquired to have either an integrated digital TV set (iDTV) or Set-Top Box (STB). All current analogue terrestrial broadcasters will need to have migrated to a digital platform.
- 1.3.4.2 It is important that in this phase:
- The government may consider discontinuing the import of analogue TV sets, preferably at a given date.
 - The affected viewers are being monitored (by having call centre on stand-by) and research is carried out to identify any problems and learning points for the next switch-off region. Especially after the first

region some time should be allowed before switch-off starts in the next region in order to incorporate the lessons learned;

- Analogue equipment is dismantled, allowing re-use of transmitter infrastructure;
- Re-engineering of digital transmitters sites to remove any analogue restriction that might have existed in order to protect analogue TV.

1.4 Spectrum Management / Digital Dividend

1.4.1 The Government shall make available the spectrum plan for DTT services and align its plan, as necessary, to include the latest technology.

1.4.2 With a National Spectrum Plan the government strives to ensure effective and efficient spectrum usage and compliance with international standards, as well as informing industry players on the current and future (intended) use of spectrum.

1.4.3 The Government may set a policy to stop new applications of analogue licence requiring new spectrum assignments in order to reserve the spectrum for DTT and ensure no interference during the simulcast period.

1.4.4 The Government to decide on the principles of assignment and the authorisation to use the spectrum for DTT roll out which may comprise the following:

- Apparatus or Spectrum Assignment, subject to the laws and regulations of each country.
- Period of assignment
- Eligibility of service providers
- Submission of a Detailed Business Plan for approval
- Notice of invitation to apply

1.4.5 The Government shall make available the implementation and migration plan involving other service users sharing the existing broadcasting spectrum within a specified period.

1.4.6 The Government will coordinate spectrum use between neighbouring countries and may insist on operator-to-operator coordination with service providers in the event of any interference that may occur.

1.4.7 The government must specify the plan for the use of the analogue spectrum (the digital dividend) after ASO, eg:

- would the frequencies be set aside for broadcasting use only or would they be opened up for other uses?;

- frequencies allocation;
- capacity given to existing analogue broadcasters;
- consideration to restack the frequencies after ASO

1.4.8 Government shall coordinate with neighbouring countries about the frequencies that will be used/shared in border areas in order to avoid interferences

1.4.9 Government shall determine the use of Single Frequency Network (SFN) or Multi Frequency Networks (MFN).

1.5 Technology & Standard Regulations

1.5.1 Transmission Standard (digital transmission and coverage area)

The government will set standards for Digital Terrestrial Television (DTT) services to achieve interoperability, economies of scale and safeguard public interest.

1.5.1.1 The Government is to decide on the appropriate standard to be adopted taking into consideration global and regional developments, availability and cost of STB, interactive and middleware applications.

1.5.1.2 The Government is to ensure that the digital coverage area, transmission levels and other technical parameters utilised by the infrastructure provider is implemented in accordance to the standards of the country, ITU standards, spectrum plans and Radio Regulations as agreed and adopted by the country.

1.5.1.3 The Government is to ensure that the roll out and service coverage is implemented in accordance to the national plan (e.g. 85% to 97% coverage) within the respective schedules and timelines.

1.5.2 Set-Top Box (STB)

1.5.2.1 The establishment of the standards may be done with technical industry forum/groups to include upgrades on technical specification as options (this may also include the possibility of designing standard technical specification for an embedded digital tuner into an integrated Digital Television (iDTV).

1.5.2.2 The technical specifications to be adopted and registered or mandated as necessary to ensure conformance and certification of the STB to be deployed in the country.

1.5.2.3 The Government may assign an already existing body to certify the STBs or alternatively set up a new unit to undertake this process.

1.5.2.4 The government may determine the exact starting date of Digital Switch-On for industry certainty to produce STB and iDTV.

1.5.3 Service Quality (video and audio quality)

1.5.3.1 The standard of these areas must be established. For service quality, the government needs to decide on the level of detail to specify, eg should it set service standards for indoor reception.

1.5.3.2 Service Quality may be set by the Government as part of the licence conditions to the industry player/s and assessment/audits to be conducted regularly to ensure adherence on technical specifications and service level availability.

1.6 Financial Resources

1.6.1 Budget allocation

The government should set aside sufficient funding for the possible costs involved, including:

- Costs for migrating viewers to digital
- Compensating consumer costs for purchasing a digital receiver;
- Helping to install new digital receiver equipment (possibly limited to a selected group of people with special needs);
- Transmitter network migration efforts ;
- Re-farming of spectrum efforts and compensations;
- Simulcast period for PSB services (the costs of running two networks in parallel during the simulcast period);
- Managing the ASO process and informing all relevant parties
- Setting mandatory certification and labeling of receiver equipment (to safeguard proper functioning and avoid scams/frauds)
- Cost for resolving any DTV interference

1.6.2 Government Incentives

1.6.2.1 The government must decide on policies and specify any incentive e.g. funding of STBs & infrastructure, subsidies, tax rebates to facilitate digital switchover and the method of distribution/allocation of these incentives. Include key considerations in determining what type of incentives (if any) to adopt.

1.6.2.2 The Government may come up with policies to encourage the take up of DTT services such as providing

Grants to Broadcasters and Content Providers to create a multitude of compelling content and applications that are different from the current analogue services in the country.

1.6.2.3 In ensuring a smooth migration and assisting the Broadcasters during the simulcast period, the Government may come up with a policy to subsidise the analogue or digital transmission cost of Broadcasters, whichever is lower.

1.7 Convenient Access to National Channels

The government needs to determine the regulations (eg must carry requirements) needed to ensure that consumers have convenient access to national channels.

2 BROADCASTERS

This section provides an overview of the key issues and choices for operators when planning for broadcasting DTT services. Some of the issues regarding technology choices, frequency planning and network planning may also be relevant to Regulators, depending on the roles and responsibilities of regulator and network operator in a country.

2.1 Technology and Standard

choices regarding the selection of DTT transmission standards and associated systems.

1. Technical tests to evaluate system performance;
2. SDTV and HDTV specifications;
3. Selection of DTT transmission standard;
4. Compression system;
5. Encryption system;
6. Additional services;

Determining the TV presentation formats is a step that precedes the actual selection of a transmission standard and system. TV presentation formats, Standard Definition TV (SDTV) and High Definition TV (HDTV) are independent of the transmission standard and are established as part of the program production process. However, the choices on the presentation format have an impact on the broadcast delivery process. Choices in the delivery process are also of great importance for the presentation of the picture to the viewer.

Conditional access system and systems for additional services should be made within the framework of relevant legislation and regulations and market and business development decisions.

2.2 Infrastructure Readiness

- Complete replacement of analogue to digital broadcasting equipment should be in line with the National Digital Plan.
- Firm up number of channels for DTV services and confirm allocation for regional and state TV services.

2.3 Content Development

- Content variety and quality must be better than analogue broadcasting and the amount of digital content must reach specific percentage during Digital Switch-Over
- Utilize available grants that may be offered by the Government to create more content and applications on DTT platform.
- Planning of interactive applications and new content for DTT services.

2.4 Capacity Building & Competencies

It is essential that managerial and technical staff understand not only the main principles regarding network architecture and network planning, but also the impact of technical choices on the business plan and regulations. Training sessions and seminars will help in educating staff. In case of limited human resources, external experts may be contracted to assist staff, to perform a number of tasks or to advise the management.

Specific number or percentage of skilled manpower in digital production and transmission must be achieved within a specific time-frame.

2.5 Network roll-out planning

The objective of network roll-out planning is to establish a network implementation plan, taking account of regulatory, commercial and technical provisions. There are 3 key areas on network roll-out planning that include:

- 1) Test transmissions;
- 2) Implementation plan;
- 3) Information to consumers.

The roll out plan should be made on the basis of:

1. Obligations from the regulator given in:

- Licence terms and conditions;
 - ASO planning and milestones.
2. Commercial decisions given in:
 - Service proposition and business plan;
 - Agreements with receiver manufacturers and dealers.
 3. Technical choices made regarding:
 - Design principles and network architecture;
 - Network planning;
 - Transmission equipment availability.

Any remaining capacity left in planning roll-out is often used to satisfy practical considerations.

2.5.1 Test transmissions

When DTT services are introduced for the first time in an area, it is recommended to accompany the technical test with service demonstrations to familiarize market parties, including local dealers of terminal equipment, with the service performance. The tests include: -

1. Site test;
2. Coverage measurements;
3. Receiver tests;
4. Demonstrations

Technical tests should be performed in order to:

- Compare performance of standards, such as the power needed to cover an area with a certain bit rate;
- To test particular national requirements (e.g. indoor or mobile reception, reception in areas with many extreme high buildings, Single Frequency Network (SFN)/Multi Frequency Network (MFN) operation);
- To educate technical staff

Before introducing operational DTT services, pilot transmission are often performed for:

- Education of technical staff;
- Familiarize key persons in government and market parties with DTT;
- Testing acceptance of DTT services by consumers;
- Demonstrating DTT services;
- Prelaunch of DTT services.

To date DTT has been implemented in many countries in all Regions. It is probably no longer necessary to

perform technical tests for selecting or investigating a transmission standard. All transmission standards have proven their performance in practice. However, there are distinct differences between transmission standards in technical behavior and in frequency management.

2.5.2 Implementation plan

The implementation plan generally consists of several phases. Two main phases are:

- DTT implementation before analogue TV switch-off;
- DTT implementation and modifications to already existing sites after analogue TV switch-off.

In addition to both main implementation phases, sub phases could be planned for introduction of DTT stations, taking account of e.g.:

- Regional areas;
- Areas covered by one SFN/MFN;
- Population distributions;
- Type of station (e.g. main stations, gapfillers).

2.5.3 Information to Consumers

Consumer support should be based on realistic data concerning coverage, service quality and implementation schedules.

3 PUBLIC AWARENESS

This section provides an overview of key issues pertaining communication plan and public education to prepare the public for Digital Switch-Over.

3.1 National Communication Plan (NCP)

The government need to determine the specific implementing agency to carry out the NCP and make clear what are the roles of government and industry in the NCP

3.1.1The government must design a proper Communication Plan informing the public at large and the television industry about the changes in the areas of legislation, policies and regulations (related to the introduction of DTT). Providing adequate and timely information will ensure and support rapid service take-up, market development (i.e. content development and receiver supply/availability) and a smooth service transition.

- 3.1.2 The government needs to make clear ASO communication plan to viewers which will address:
- 3.1.2.1 Communication strategy: including communication messages (related to the communication stage) and target groups;
 - 3.1.2.2 Communication tools: the various communications means to reach the listed target groups; the most critical communication tool is the television channel(s) of the Public Service Broadcaster (PSB). Intensive communication on the PSB channels will be crucial for informing the viewers.
 - 3.1.2.3 Communication tools should be tailored and applied to two main categories of audience:
 - a.** Consumers/general public:
 - i. Consumer associations and interest groups (and they inform their members);
 - ii. Road Shows
 - iii. Printed media (newspapers and magazines);
 - iv. Radio and television channels (for specific events like the ASO,
 - v. Direct mail
 - vi. Call or contact Centres
 - vii. websites, etc.
 - b.** Industry:
 - i. Market consultation and information sessions;
 - ii. (International) conferences and fairs;
 - iii. Direct mail (using the Regulators' licence holder registers);
 - iv. Website (perhaps with a special login for licence holders);
 - v. Printed media (official Gazette, newspapers and professional magazines).
- 3.1.3 The government should limit the risks of distorting or confusing the market by communications based on the principles of:
- a. Impartiality and accountability: making sure that certain market parties or consumer groups are not favored, that policy decisions are evidence-supported and are based on a legal constitution;
 - b. Responsibility: only communicate about topics where there is direct responsibility. For

- example, informing the market about available transmitter or receiver equipment might be best left to the market;
- c. Transparency: keep the audiences continuously up-to-date on the regulatory process and decisions (even when there is no progress). Provide timely and complete information so that consumers and industry can have a reasonable preparation time;

4 INDUSTRY

This section provides an overview of the key business issues and choices DTT Service Providers/Broadcast network operators/industry face when planning the commercial launch of these services.

4.1 Receiver availability

Service Provider should check receiver availability and price levels. Very often the functional requirements will have to be translated into detailed technical specifications. For example the functional requirement of having a defined EPG (providing a 7 day-ahead program overview with program title, start date, duration, parental rating, etc) will have to be translated to EPG compliance with ETSI EN 300 468 v1.9.1 and Character set ISO/IEC 8859- 7. It is important to note that the technical specifications might not necessarily only be driven by the functional requirements. For example regulatory requirements might stipulate the compression or transmission standard. In addition, the Broadcast Network Operator may stipulate technical network requirements to the Service Providers on his platform.

4.2 Market and business development

Commercial parties will seek a DTT Service Proposition which fulfills a consumer demand and generates sufficient revenues (either advertising or subscription based). In contrast, Public Service Broadcasters (PSB) normally fulfill objectives of public interest in the field of information and culture.

It is necessary for industry to identify the demand drivers (i.e. customer needs), competitive advantages, and service uptake projections and possibly market entry barriers in the local market(s). Service Providers and Network Operators will carry out some form of market research to identify these demand drivers, competitive advantages and service uptake projections.

4.3 Content provider

To ensure that content providers manage to deliver specific % of digital content to broadcasters within specific time-frame.

4.4 Telecommunications development

Readiness of other supporting industries (e.g. communications infrastructural networks for interactive services).

4.5 Business Planning

Business planning process will result in a plan for launching or introducing DTT in a defined market, including a set of business goals, the way they can be achieved and the required (financial) means.

4.6 Consumer Support

4.6.1 Readiness in responding to questions and complaints, and providing assistance to consumer related to digital broadcast reception

4.6.2 Customer Service and support: the process of handling customer questions and support requests (e.g. resolving technical problems, organizing installation services, etc.); Service provisioning: the process of the actual service activation in the conditional access system (CAS) and inserting the encryption keys in the broadcast signal. In addition, service provisioning includes the smart card and receiver logistics.

4.6.3 Consumer support also includes the Customer Relationship Management (CRM) process comprising normally the following interrelated sub-processes:

1. Subscription management
2. Order management and fulfillment
3. Catalogue management: the process of administering, introducing and changing the various DTV service offerings, packages & tiers and pricing & discount schemes;
4. Marketing campaign management.