

Assistance for DTTB Implementation

Workshop Report

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# This document is the report of the first ITU, EBU, BNE and DVB joint event on the subject of «Assistance for DTTB implementation».The aim of the workshop was to start bridging the knowledge gap between countries where DTT is a well-established and successful audiovisual delivery platform and countries where the digital switchover process is still ongoing. The event proposed speakers from the «Sources of expertise» side and to maximise the reach the event has also been webcasted.This report contains the presentations of the workshop and additional references and contact points for further assistance or collaboration, as needed from individual Regulators/organizations.

# The Presentations given in the workshop are available from the following link:

# <http://www.itu.int/en/ITU-R/study-groups/workshops/2016-DTTB/Pages/Joint-ITU-EBU-BNE-DVB-Workshop-on-Assistance-for-DTTB-Implementation---Presentatons.aspx>

# 1. ITU activities and database

 **1.1 Key takeaway**

A large percentage of countries are yet to conclude the digital switchover process and over the years the ITU has taken concrete actions to support this critical activity.

Starting with the generation of the initial requirements, the ITU provided and adapted the necessary software and tools, but also organized workshops and trainings to finalize the requirements and assess technical compatibility.

In this context the results of GE06 coordination meetings in Sub-Saharan Africa (ATU) & Arab Region (ASMG) have been successful. The ITU has helped so far more than 40 countries for establishing national goals, strategies, key activities.
This resulted in a number of publications and reports. In addition ITU developed a web portal for following the status of the digital terrestrial television broadcasting transition (DSO database).

To summarize:
- ITU assists in frequency re-planning.

- ITU assists in developing roadmaps for Analogue to Digital transition

- ITU organizes workshops, forums and training

- ITU assists in providing monitoring information – DSO database. Please update your country information.

**1.2 References**

|  |  |  |  |
| --- | --- | --- | --- |
| **Subject** | **Document title** | **Scope** | **Source** |
| ITU activities | Global status of digital migration and ITU activities |  | ITU[Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/1_Global%20status%20of%20digital%20migration%20and%20ITU%20activities.pdf) |
| ITU assistance in planning additional DTT frequency channels in the band 470-694 MHz, in regions under GE06 Agreement |  | Following the results of WRC-12 and 15 relating to the allocation to the mobile serviceof the 800 and 700 MHz bands, ITU assisted two Regional Groups ATU and ASMG in planning additional TV frequency channels in the Band 470-694 MHz. The results and process of the planning are on <http://www.itu.int/en/ITU-R/terrestrial/broadcast/Pages/FMTV.aspx>  | ITU[Link](http://www.itu.int/en/ITU-R/terrestrial/broadcast/Pages/FMTV.aspx) |
| Digital Switchover and Digital Dividend | ITU-R FAQ on the DIGITAL DIVIDEND and the DIGITAL SWITCHOVER | This document provides answers to the frequently Asked questions relating to the process of switching off the analogue television and the Digital Dividend principles | ITU [Link](http://www.itu.int/en/ITU-R/Documents/ITU-R-FAQ-DD-DSO.pdf)  |
| Digital DividendInsights for spectrum decisionsAugust 2012 | This document provides a detailed insight into what the digital dividend process entailsand helps national and internal spectrum decision makers to allocate and manage the digital dividend process.  | [Link](http://www.itu.int/ITU-D/tech/digital_broadcasting/Reports/DigitalDividend.pdf)  |
| ITU-R Report | ITU-R SG1 Report on Digital DividendITU-R Rep SM.2353-0 | The challenges and opportunities for spectrum management resulting from the transition to digital terrestrial television in the UHF bands | [Link](http://www.itu.int/pub/R-REP-SM.2353) |
| DSO Database | Digital Terrestrial Television Broadcasting (DTTB) Transition database | The database is providing an analogue to digital switchover stocktaking for assisting the Member States in their migration process | [Link](http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx) |
| Broadcasting trends | Trends in broadcasting:An overview of developments | This report gives an overview of developments in broadcasting delivery technology and showing trends in the coming years. The emphasis of the report is on terrestrial broadcasting. | [Link](http://www.itu.int/ITU-D/tech/digital_broadcasting/Reports/DigitalDividend.pdf) |
| Transition from analogue to Digital broadcasting | GUIDELINES for transition from analogue to digital broadcasting (edition of 2014)  | The guidelines are intended to provide information and recommendations on policy, regulation, technologies, network planning, customer awareness and business planning for the smooth transition to Digital Terrestrial Television Broadcasting (DTTB) and introduction of Mobile Television Broadcasting (MTV).  | [Link](http://www.itu.int/pub/D-HDB-GUIDELINES.01-2014) |
| ITU-R Recommendations relating to planning the DTT  |  BT.1895, BT.2016, BT.2020, BT.2052, ... | Many Recommendations and Handbooks/Reports contain technical criteria and parameters that may assist administrations in planning their future DTT networks.  | [Link](http://www.itu.int/pub/R-REC) |
| ITU-R Handbooks and reports relating to planning the DTT | ITU-R Reports BT.2140, BT.2294, BT.2295, BT.2302, BT.2337, BT.2338, BT.2339, BT.2343... | [Link](http://www.itu.int/pub/R-REP-BT/en) |

**1.3 Contacts**

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# 2. Licensing and Business models for DTT

 **2.1 Key takeaway**

The digital switchover (DSO) an opportunity to rethink the TV market. There is no point on having an excellent DTT network without an attractive content to deliver to consumers that is economically sustainable over time. Re-thinking the TV market means to review the content strategies and policies and regulatory frameworks that are at the heart of the national TV strategy. This strategy needs to take into account consumer demand for national and international content, support the national and regional TV industry and ensure the economic sustainability of the TV ecosystem as a whole. It is in this wider perspective that Governments need to formulate their DTT strategies and to choose the most efficient business model and licencing strategies that will ensure a successful deployment of the DTT networks. The risk is that some Governments might develop a narrow DTT network focused strategy that marginalise the TV content aspects of DTT despite this is the essential reason that justifies DTT in the first place.

The DSO process sees many barriers for its completion, some could lament a limited service or competition from free to air DTH, but there could also be resistance from existing stakeholders, insufficient coverage or obsolete antenna installation and obsolete audio visual legislation. With proper planning and communication all these barriers can be eliminated.

In this context a new wave of licensing is foreseeable in 2015-2020.
A Licensing model is useful for DSO as many country reports and experiences revealed that the issuance of DTTB and MTV licenses are considered key milestones.
The ITU Licensing Toolkit
I. Draws a DTTB/MTV Roadmap example for regulators;
II. Gives a comprehensive and detailed list of activities relevant prior to the licensing process;
III. Highlights the elementary steps of a licensing process;
IV. Elaborates public measures to be considered in the licensing model.

Some important observations regard the role of Public policy that should secure the terrestrial platform being the driver for investments.
Once the DSO process is completed it is also possible to apply concrete actions to reduce costs and increase revenues, for example syndicating the infrastructure would reduce costs whereas audience measurement is a mean to increase revenue.

 **2.2 References**

|  |  |  |
| --- | --- | --- |
| **Subject** | **Document title** | **Source** |
| Business models and licencing models | Overview and the importance of content and the overall economic sustainability – Lluís Borrell, Analysys Mason | [Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/2_Licensing%20and%20business%20models%20%E2%80%93%20overview%2C%20the%20importance%20of%20content%20and%20overall%20economic%20sustainability.pdf) |
|  | The digital switchover in the next 5 years is an opportunity to rethink the TV market - Lluís Borrell, Analysys Mason | [Link](http://www.analysysmason.com/About-Us/News/Newsletter/DSO-TV-market-rethink-Oct2014/) |
| Business models | Unlocking DTT in Africa and the Middle East - a model for efficient switchover | [Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/3_Unlocking%20DTT%20in%20Africa%20and%20the%20Middle%20East%20-%20a%20model%20for%20efficient%20switchover.pdf) |
| Licensing models | How can licensing support successful DTT roll-out: a licensingtoolkit and a model license | [Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/4_A%20licensing%20toolkit%20for%20DTTB.pdf) |
| Economic growth | Fundamental reforms are needed to promote the growth of the African audiovisual sector – Olivier Pascal, Analysys Mason | [Link](http://www.analysysmason.com/About-Us/News/Insight/Fundamental-reforms-are-needed-to-promote-the-growth-of-the-African-audiovisual-sector/) |
| Digital switchover | Digital switchover in Africa and the 17 June 2015 deadline: is it already too late? - Olivier Pascal, Analysys Mason | [Link](http://www.analysysmason.com/About-Us/News/Insight/Digital-switchover-Africa-Jun2015/) |
| Digital switchover strategy | Meeting DSO deadlines: what are the international lessons for Africa and similar regions? - Lluís Borrell, Analysys Mason | [Link](http://www.analysysmason.com/About-Us/News/Newsletter/Meeting-DSO-deadlines--What-are-the-international-lessons-for-Africa-and-similar-regions/) |
| Licensing models | ITU Licensing Toolkit | [Link](http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Documents/Licensing%20Toolkit%20-%20DTTB.pdf) |

**2.3 Contacts**

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# 3. DTT Handbook: the implementation guidelines

 **3.1 Key takeaway**

In 2002, ITU published its first Handbook on digital terrestrial television under the title “Digital terrestrial television broadcasting in the VHF/UHF bands”. However, since 2002, DTTB has tremendously evolved, not only in technical but also in regulatory terms: spectrum for terrestrial TV broadcasting has become scarcer within the existing UHF broadcasting bands; more spectrum efficient transmission and compression schemes partly compensate for that loss; new requirements for improved resolution, such as HDTV and UHDTV, demand significantly higher data rates; new formats for multi-channel sound and access services need substantial bit rates; and with the advent of broadband IP networks, interactivity has become commonplace. A second edition of the Handbook, entitled “Digital Terrestrial Television Broadcasting Networks and Systems Implementation”, is concentrating on these new developments.

**3.2 References**

|  |  |  |
| --- | --- | --- |
| **Subject** | **Document title** | **Source** |
| DTT Handbook | DTT Handbook: the implementation guidelines | [Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/5_Handbook-DTTB-Implementation_final.pdf) |

**3.3 Contacts**

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# 4. Defining DTT network specifications and ensuring Quality of Service

 **4.1 Key takeaway**

Broadcast Networks Europe (BNE) is a trade organisation representing DTTB Network Operators in 22 European Countries. The main focus is to secure the long term viability of the DTTB platform and represent the commercial interests of Terrestrial Broadcast Network Operators with regard to policy developments and regulatory intervention.
BNE member companies have vast experience from implementing DTTB networks and several engage in international projects to share experience and knowledge and are keen to establish new relations with operators in countries currently establishing a DTTB service.
The aim of the presentation at the DTTB Workshop is to give a short “generic” overview of the process to implement a DTTB network and of specifications, implementation and a possible business model.

**4.2 References**

|  |  |  |
| --- | --- | --- |
| **Subject** | **Document title** | **Source** |
| Broadcasting Network specification | Defining DTT network specifications and ensuring Quality of Service | [Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/6_Defining%20DTTB%20network%20specifications%20and%20ensuring%20Quality%20of%20Service.pdf) |
| DTTB receiver Specifications | Unified DTTB Receiver Specifications and Test Plans – Open Source | [Link](http://www.nordig.org/) |
| Analogue to Digital Switch Over | 300 page comprehensive description of the Swedish Analogue to Digital Switch Over Project | [Link](http://www.sweden.gov.se/sb/d/574/a/113008) |
| Animated Video | DTT - A spectacular European Success Story | [Link](https://goo.gl/rvNIho) |

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| **Cellnex, Spain**Alfonso Juan AlvarezJordi OrtizCellnex, Spain | Technical plan for DSO and ASO.Planning, design and engineering of DTT network.New services beyond DTT, Hybrid TV, OTT, Ultra High Definition. Regulatory assessment.  Strategic plan of communication and socialization.Strategies for DTT penetration.Communication campaign design.Training and capacitation of DTT stakeholders. | alfonso.alvarez@cellnextelecom.comjordi.ortiz@cellnextelecom.com | International Business ManagerInternational Business & Consultancy Projects |

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# 5. Preparing your DTT receiving equipment specifications (STBs, TV sets and antennas): definition and enforcement

 **5.1 Key takeaway**

Having a comprehensive and well-defined specification is vital to the success of smooth DSO.
Conformance regime can ensure equipment entering the market will only be of sufficiently high quality and work well with local profiles in order to deliver the best experience.
This is why it is necessary to ensure interoperability and its complexity increases with the number of desired functionalities. This activity resolves around the involvement of all stakeholders in required.
A key aspect to ensure interoperability is testing and of course professionally designed testing will make sure everything gets tested and nothing is left to the “guess work” when equipment is put out in the live environment.
At the moment there are three possibilities concerning conformance models:
- Do minimum approach: it requires low effort but it’s damaging to the whole ecosystem
- Self-certification: it is risky and it relies on the honesty of the manufacturer
- Test centre: it provides full control and ensures the best result
Having full control on the conformance model is key in the light that it is common that no device would pass the conformance test the first time.
In the end having high quality equipment is critical because it directly impacts the viewing experience of customers who could blame the platform (DTT) for insufficient quality instead of poor equipment.

**5.2 References**

|  |  |  |
| --- | --- | --- |
| **Subject** | **Document title** | **Source** |
| Receiving equipment specifications | Interoperability: its complexities, pitfalls and solutions | [Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/7_Interoperability%20its%20complexities%2C%20pitfalls%20and%20solutions.pdf) |
| Receiving equipment testing | The Importance of Test Suites | [Link](http://www.eurofins-digitaltesting.com/downloads/download-the-importance-of-test-suites-white-paper/?mediaId=1675&linkText=The%20Importance%20of%20Test%20Suites&media=/media/28828/importance-of-test-suites-web.pdf) |
| Receiving equipment testing | HbbTV Testing for Broadcasters & Operators | [Link](http://www.eurofins-digitaltesting.com/downloads/download-our-hbbtv-testing-for-broadcasters-operators-white-paper/?mediaId=1517&linkText=HbbTV%20Testing%20for%20Broadcasters%20&%20Operators&media=/media/28677/hbbtv-whitepaper-on-hbbtv-testing-for) |

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# 6. DTT, a catalyzer for local content production

 **6.1 Key takeaway**

Linear TV in not dead, the future of TV is not on demand or live, it’s a bit of both.
Content is king and in particular national/local content is source of job creation and economic growth.
Compared to other linear TV distribution means, DTT has a particular and effective role in promoting Local Content Production and providing the Right Content to the Right Audience.
These two critical factors make DTT an indispensable platform for the delivery of audiovisual content.

**6.2 References**

|  |  |  |
| --- | --- | --- |
| **Subject** | **Document title** | **Source** |
| Program portfolio strategy | DTT a catalyzer for local content production | [Link](https://tech.ebu.ch/docs/events/DTTworkshop2016/9_DTT%20a%20catalyzer%20for%20local%20content%20production.pdf) |
| Digital switchover strategy | The digital switchover in the next 5 years is an opportunity to rethink the TV market - Lluís Borrell, Analysys Mason | [Link](http://www.analysysmason.com/About-Us/News/Newsletter/DSO-TV-market-rethink-Oct2014/) |
| Digital switchover strategy | DSO in Africa is not only a matter of technology: content also remains a key issue - Olivier Pascal, Analysys Mason | [Link](http://www.analysysmason.com/About-Us/News/Newsletter/DSO-in-Africa-is-not-only-a-matter-of-technology-content-also-remains-a-key-issue/) |
| Local content production | Local content and international cooperation | [Link](https://issuu.com/alaincharles/docs/caf_5_2016) (page 23) |

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