



**ITU/NBTC Conference on Digital Broadcasting
Digital Terrestrial Television Broadcasting (DTTB) in Thailand
12 December 2017, Bangkok, Thailand**

DTTB Implement status and Lessons Learnt in Thailand

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Content

- ❖ Thailand Broadcasting Landscape
- ❖ Broadcasting Master Plan and Licensing Framework
- ❖ Network Planning and Monitoring (Frequency Planning , Network Rollout , Coverage Check & QoS)
- ❖ Broadcasting Service Licensing (Spectrum Auction, DTV Service Channeling)
- ❖ ASO Plan and Status
- ❖ DTV Receiver and Subsidy Program
- ❖ DSO Communication Strategies and Implementation
- ❖ Broadcasting Indicators and User Survey

National Broadcasting and Telecommunications Commission (NBTC)



Established under the *“Act on Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunication Service, B.E. 2553 (2010)”*

NBTC mandates:

- ❖ To license and regulate the operation of TV and radio broadcasting, radio communication, and telecommunications
- ❖ To promote free and fair competition in the industry
- ❖ To ensure universal telecommunications/broadcasting services is provided
- ❖ To promote research and development in the industry
- ❖ To protect right and liberty of the citizen and consumers from being exploited by the operators
- ❖ To maintain plurality in the provision of broadcasting
- ❖ To protect for the citizen and consumers against unfairness or the infringement of privacy, and against offensive or harmful material

New version Organization Act. (2017) has been adopted

The NRA
Organization Act of
2010*

Telecommunications
Act of 2001

Broadcasting Act of
2008

Radio
Communications
Act of 1955

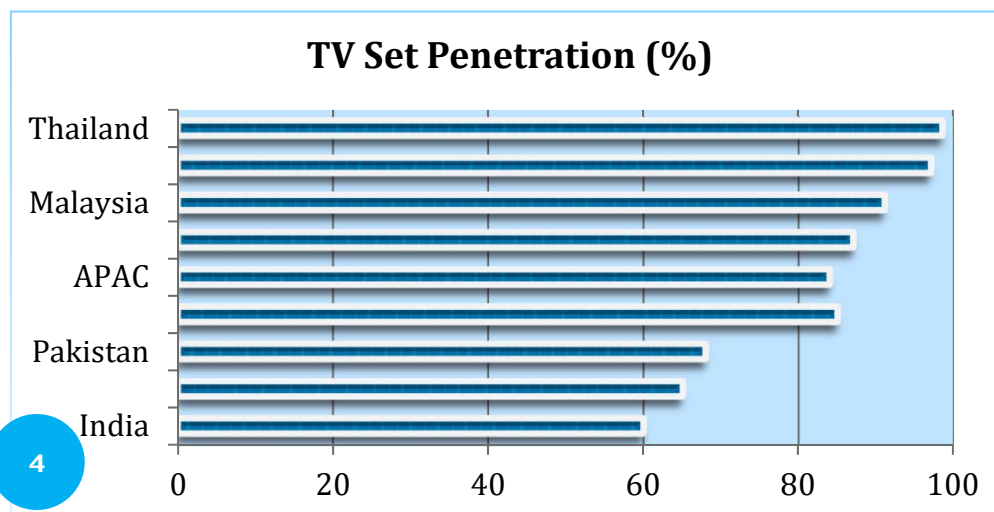


Thailand TV Broadcasting Landscape : TV broadcasting timeline

History of TV Broadcasting in Thailand: 62 years

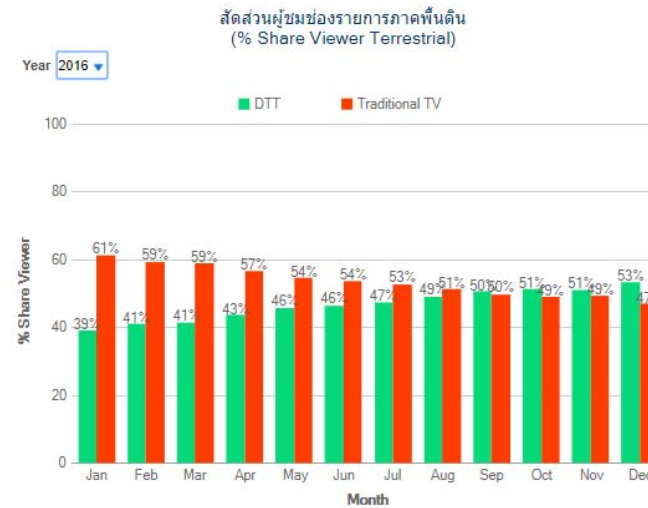
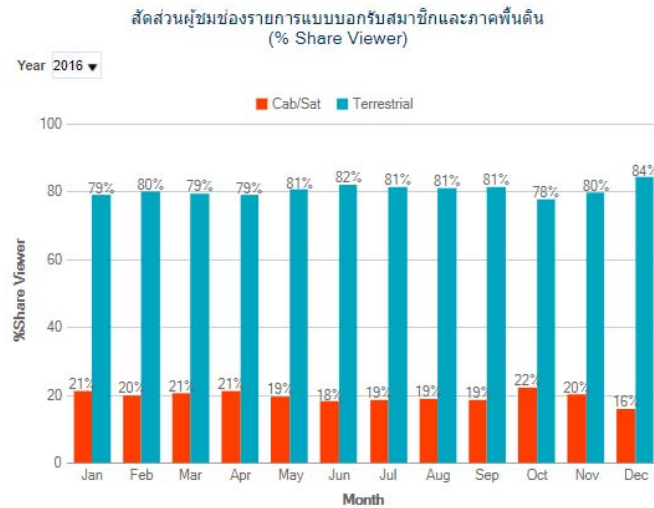


~ 22 million TVHHs in Thailand with
98% TV penetration, APAC average 84%

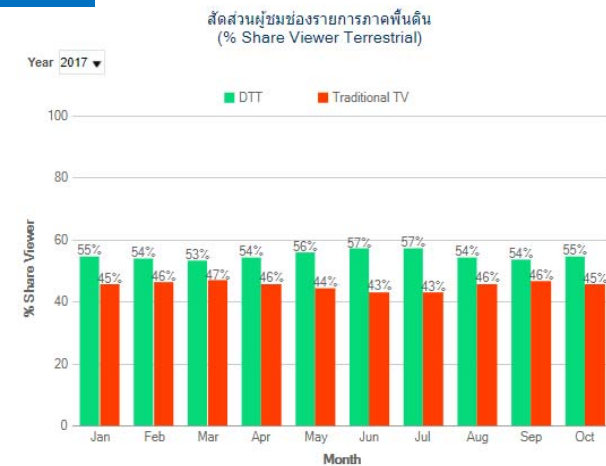
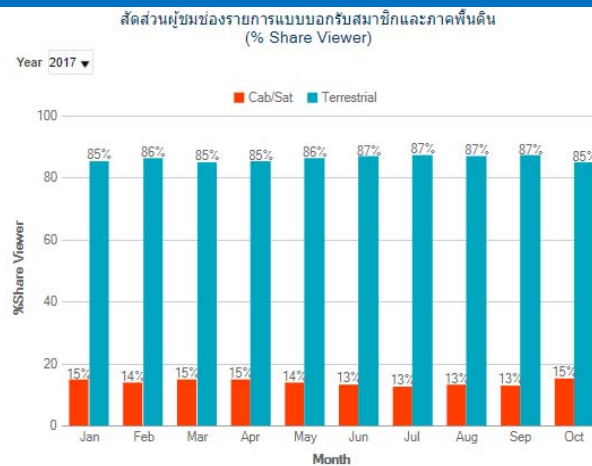


Thailand Broadcasting Landscape : Share Viewer

% Share Viewer Pay TV and Terrestrial:2016

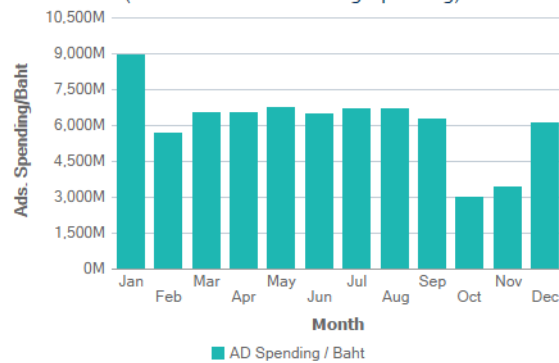


% Share Viewer Pay TV and Terrestrial:2017



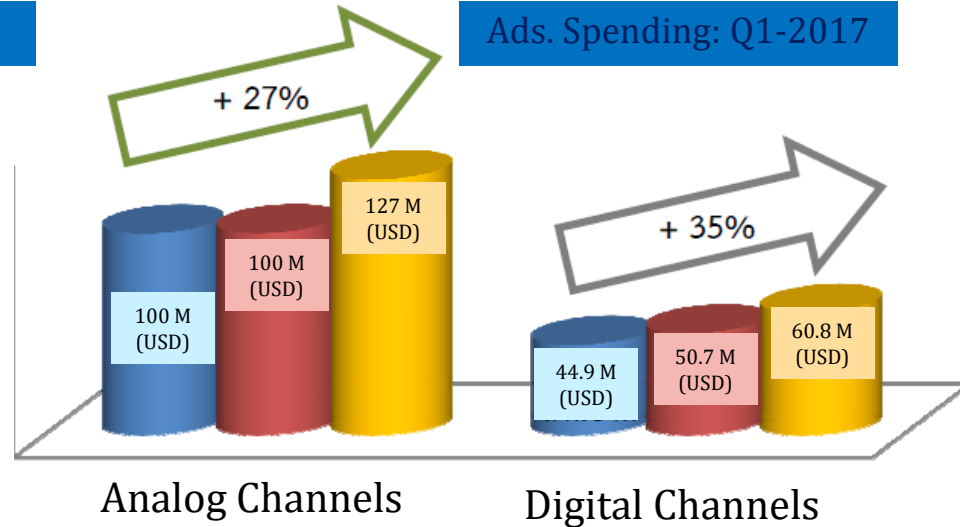
Thailand Broadcasting Landscape : Advertising Spending on Terrestrial

% Terrestrial TV Advertising Spending



Source : Nielsen
Remark : 28 Cab/Sat Channels Only
Last Update : January 09, 2017

Ads. Spending: Q1-2017



ADEX IN THE FIRST HALF OF 2017

| | H1 2016 | | H1 2017 Actual | | H1 17 vs 16 |
|-----------------|---------------|-----------|----------------|-----------|-------------|
| | Bt m. | % | Bt m. | % | % Change |
| TV | 26,027 | 41 | 22,047 | 37 | -15% |
| Digital TV | 10,766 | 17 | 11,159 | 18 | 4% |
| Cab/Sat | 1,937 | 3 | 1,820 | 3 | -6% |
| Total TV | 38,730 | 61 | 35,026 | 58 | -10% |
| Radio | 3,010 | 5 | 2,480 | 4 | -18% |
| Newspapers | 7,160 | 11 | 5,813 | 10 | -19% |
| Magazines | 1,674 | 3 | 1,070 | 2 | -36% |
| Cinema | 2,721 | 4 | 3,410 | 6 | 25% |
| Outdoor | 2,574 | 4 | 3,048 | 5 | 18% |
| Transit | 2,438 | 4 | 3,098 | 5 | 27% |
| In-Store | 343 | 1 | 483 | 2 | 41% |
| Internet | 4,739 | 7 | 5,890 | 10 | 24% |
| Total | 63,389 | | 60,318 | | -5% |

■ Jan17 ■ Feb-17 ■ Mar-17

Source: Nielsen

National Digital Broadcasting Plan: Broadcasting Master Plan and Digital Economy Plan

Act on Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunication Service, B.E. 2553 (2010)



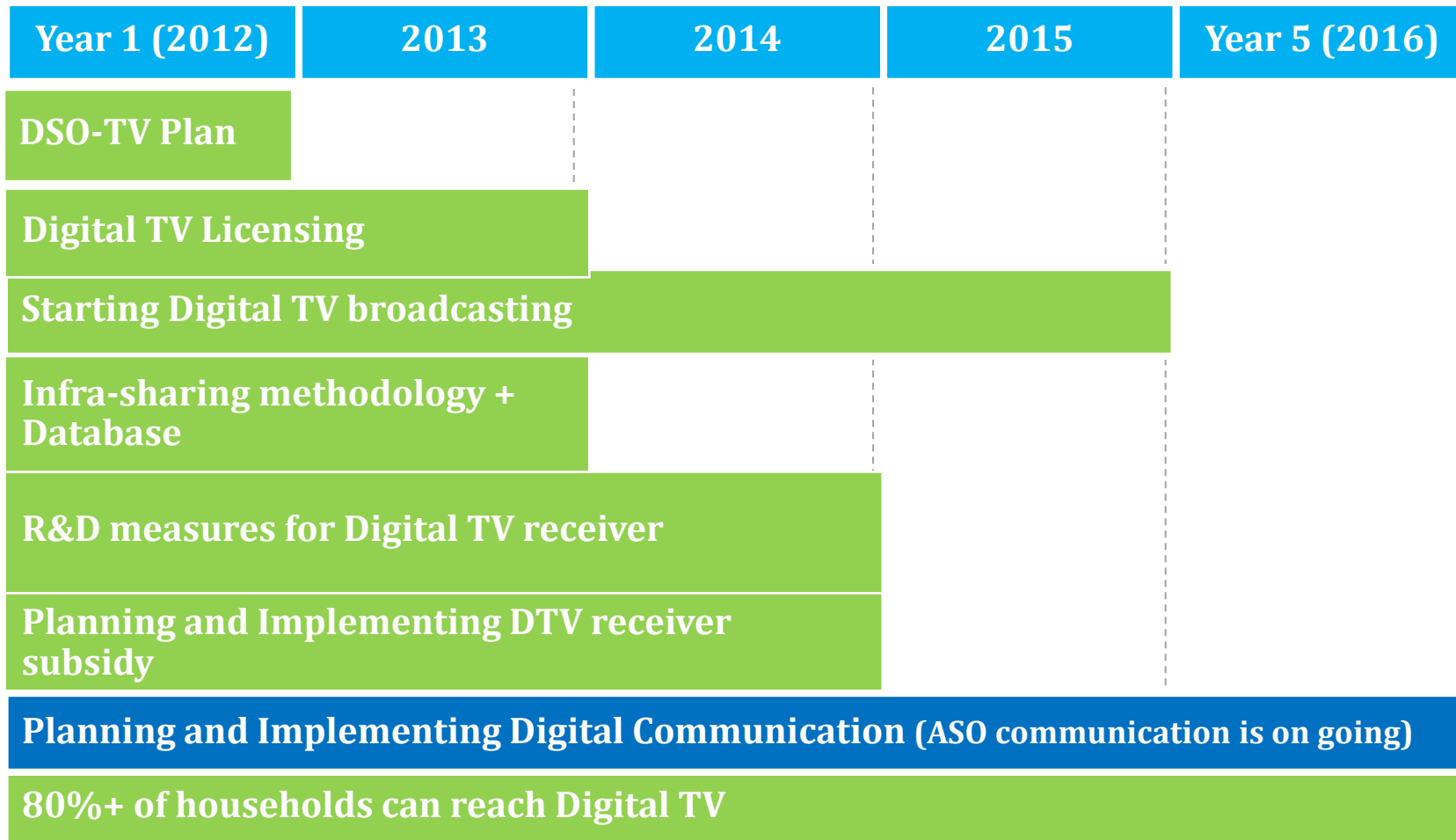
The first Thailand Broadcasting Master Plan (2012-2016, extended)
Strategy No. 6 Transition from Analog to Digital Broadcasting

Thailand Digital Economy and Society Development Plan(2016-2018)
Strategy No. 1 Develop digital infrastructure
Target: Deploying Digital TV and Digital Radio broadcasting services cover nationwide, providing Digital Radio broadcasting services with in 3 years



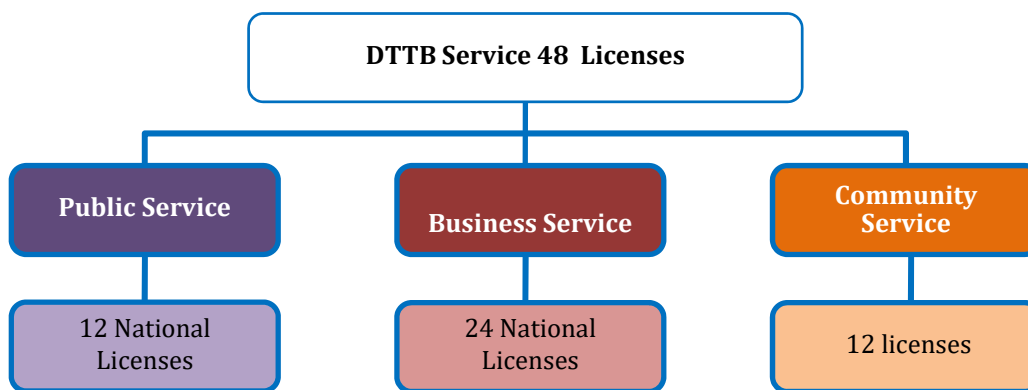
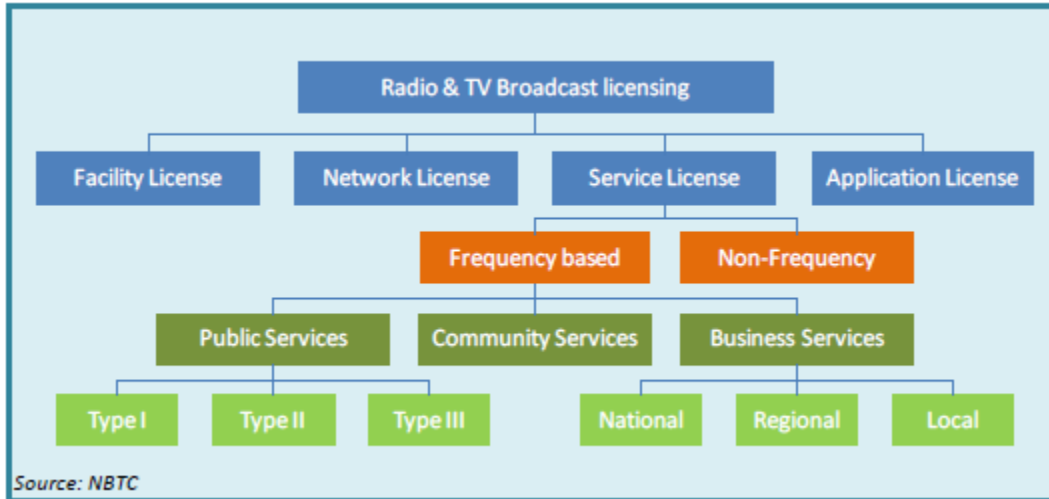
DSO Roadmap (Broadcasting Master Plan#1: 2012-2016)

1st Broadcasting Master Plan has been extended until the 2nd master plan will be adopted







Broadcasting Licensing Scheme




Licensing status (as of Oct 2017)



DTTB Network: 5 licenses

DTTB Services: 23 licenses
Business 22, Public 1



Satellite and Cable TV 615 licenses

Network operators: N 38, R 60, L 314 licenses

Facility operators :7 licenses

DTTB Frequency and Network Planning

Policy on DTV technology

- ❖ DVB-T2 was selected for DTV transmission standard
- ❖ Resolution is HD and SD are applied.

Frequency Planning Basic Approach:

- ❖ Frequency Range : UHF 510 – 790 MHz
- ❖ Bandwidth : 8 MHz
- ❖ Frequency Channel : Channel 26 – 60
- ❖ Service Area : 39 service areas
- ❖ Number of Main sites : 39 sites
- ❖ 5MUXs (5 frequency channels) per Service Area
- ❖ 6th MUX is reserved for community services
- ❖ Infrastructure sharing between all MUXs
- ❖ Each main site will be MFN with others.
- ❖ Each main site and its additional sites will be SFN.
- ❖ Compatibility between Digital-Digital and Digital-Analog
- ❖ FX reception coverage target is 95% of households

39 Local Service Areas (77 provinces)







| DVB-T2 Parameters | Value |
|-------------------|--------------|
| FFT size | 16K extended |
| Guard Interval | 19/128 |
| Modulation | 64-QAM |
| Code Rate | 3/5 |

DTTB Network Licensing and Roll-out Obligation

Network Licensing

- ❖ Issued 5 DTTB Network Licenses for 4 Network Providers (PRD 1, RTA 2, MCOT1, TPBS1) in Jun 2013, all agreed to share common facilities e.g. towers, antennas, combiners
- ❖ Currently, 39 main sites and additional sites implemented cover **95% HHs** coverage

| | |
|---|--|
|  | Public Relation Department (PRD) 1 network license |
|  | Royal Thai Army 2 network licenses |
|  | MCOT 1 network license |
|  | Thai PBS 1 network license |

Network Rollout Obligation

- ❖ Network Rollout Obligation: 95% HHs coverage within 4 years : 39 main sites + 129 additional Sites (168 sites in total)

| Year | HH Coverage |
|------|---------------------------------|
| 1 | 50% in Jun 2014 (11 mil. HH) |
| 2 | 80% in Jun 2015 (17.6 mil. HHs) |
| 3 | 90% in Jun 2016 (19.8 mil. HHs) |
| 4 | 95% in Jun 2017 (22 mil. HH) |

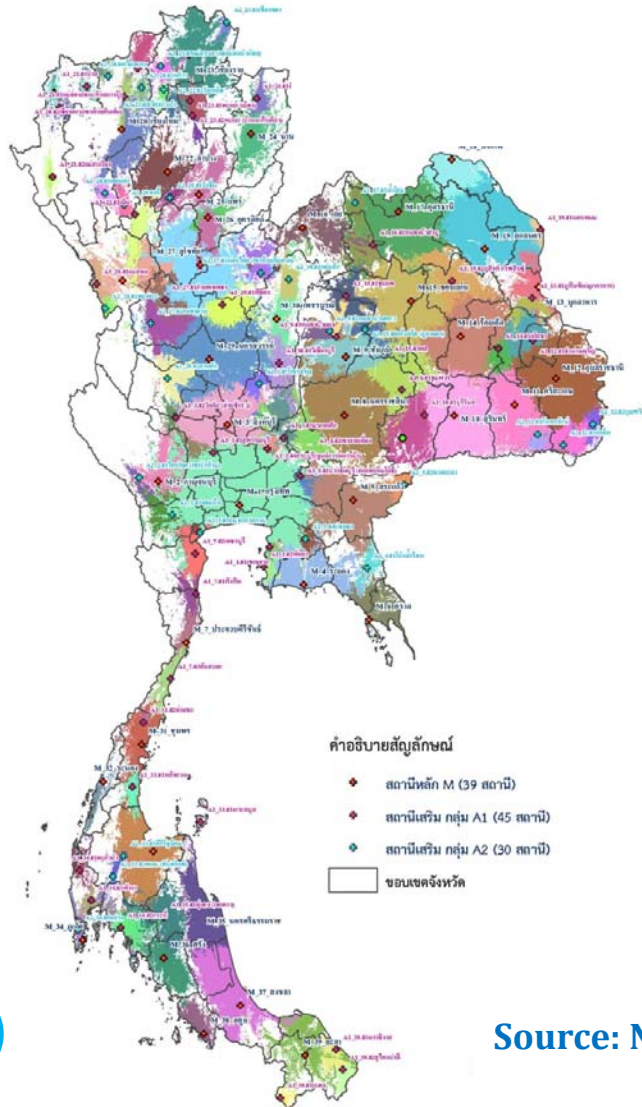
- ❖ Portable indoor reception mode in Municipality areas
- ❖ 20 % of MUX Capacity for Community TV service

Network Quality

- ❖ Service Availability: $\geq 99.98\%$
- ❖ Coverage audit and signal measurement

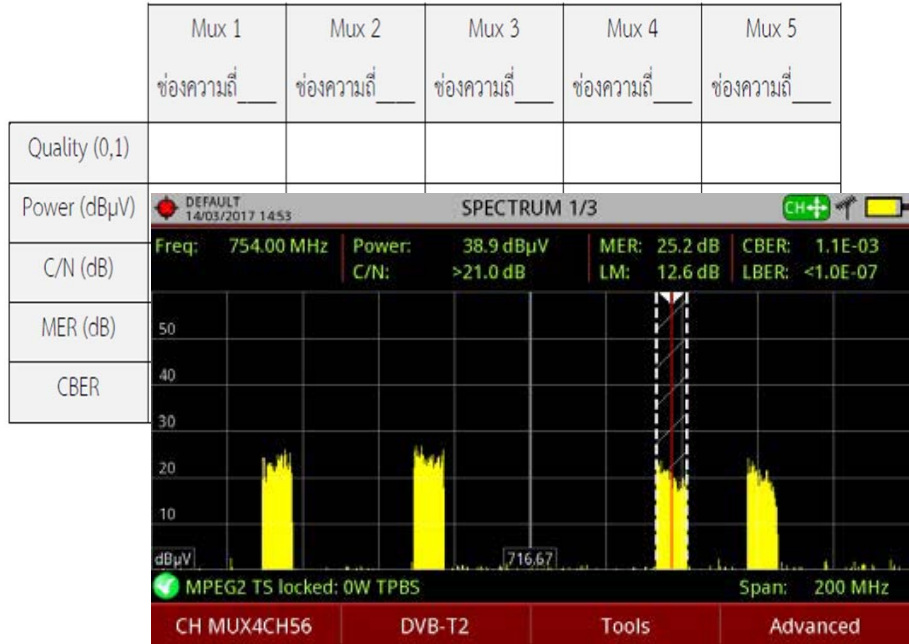
DTTB network coverage auditing and signal measurement

DTTB Network Coverage (as of May 2017)



Source: NBTC

Template signal measurement



DTTB network coverage auditing and signal measurement

Signal measurement at DTTB Station/field



| Pass | Limit | Results | Limit | Unit |
|---------------------|----------|---------|---------|------|
| Level | -60.0 | -16.3 | 10.0 | dBm |
| Sideband | | normal | | |
| FFT Mode | | 16k est | | |
| Guard Interval | | 1/2 | | |
| Carrier Freq Offset | -30000.0 | 492.3 | 30000.0 | Hz |
| Bit Rate Offset | -100.0 | 0.6 | 100.0 | ppm |
| MER (L1 rms) | 33.0 | 99.0 | | dB |

| PLP Data (Decoded PLP ID) | | | |
|---------------------------|------------------|--|---------|
| MER (PLP rms) | 33.0 | | dB |
| MER before LDPC | 0.0e-2(46%/1e10) | | 1.0e-2 |
| LDPC Iterations | 1.00 | | |
| BER before BCH | 0.0e-2(27%/1e10) | | 1.0e-5 |
| BBFRAME Error Ratio | 0.0e-4(68%/1e6) | | 1.0e-10 |
| ErrorRate Second Ratio | 0/3 (0/20) | | 10% |
| TS Packet Error Ratio | 0/3 (0/20) | | 1.0e-7 |



Assist people to receive DTV signal



DTV Services Licensing : Spectrum Auction



Spectrum auction for business broadcasting service license National Level-
on 26-27 Dec2013 : 24 Business licenses (4 Categories)

Kids & Family

- 3 Licenses
- Reserve Price 140 MB

- Total Bidding Price 1,974 MB

News and Documentary

- 7 Licenses
- Reserve Price 220 MB

- Total Bidding Price 9,238 MB

SD-General

- 7 Licenses
- Reserve Price 380 MB

- Total Bidding Price 15,950 MB

HD-Genenal

- 7 Licenses
- Reserve Price 1,510 MB

- Total Bidding Price 23,700 MB

**Total 24 Business Service licenses
(Reserve Price \$ 474 million)**

**Auction Results 50,862 MB
(\$ 1,589 million)**

DTTB Services Channeling : 48 Channels



Public: Ch 1-12

Business: Ch13-36

Kids/Youth & Family Channels 13-15

General Channels (SD) 23-29

General Channels (HD) 30-36

- 1
- 2
- 3
- 10

Public Channels 1-12

- 13
- 14
- 15

- 16
- 17
- 18
- 19
- 20
- 21
- 22

News /Info Channels 16-22

- 23
- 24
- 25
- 26
- 27
- 28
- 29

- 30
- 31
- 32
- 33
- 34
- 35
- 36

Community TV : ch 37 to 48 reserved in each service area
* Now Ch1-3 are simulcast channels

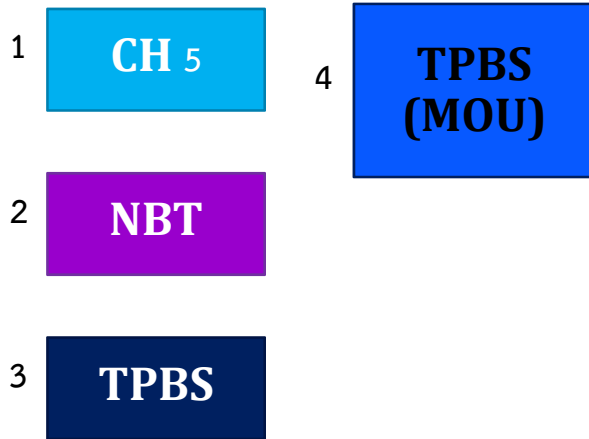
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Public Services Channels

Simulcast





5  5. Knowledge, Education, Science, Technology and Environment

6  6. Religion, Art & Culture, Agriculture and Occupational Development and promotion


7  7. Health Sanitation Sport and promoting quality of people life


Type 1


8  8. State Security

9  9. Public Safety

Type 2

10  10. Strengthen the well understanding between government and citizen. Also, Strengthen the well understanding between parliament and citizen

11  11. Advocating in term of the contributing and educating population about democratic form of government with the King as Head of State

12  12. Servicing an beneficial information to disability persons or less opportunity persons.

Type 3



ASO Plan and Status: Thailand

- ▶ **ASO Plan:** 5 ATV channels (Ch5, Ch7, Ch11, Ch9, TPBS) plan to switch Off all ATV site in mid of 2018.
(Ch3 and Ch7, concession agreement in 2020, 2023).
- ▶ **ASO Starting:** Analog switch off has been started since Dec2015, 50 **ATV sites** were switch off as of Nov2017.
- ▶ **The MUX6th** is reserved for Community TV which is available after switch off ATV.

| ATV Channel | ASO Plan (2015-2018) | ATV Sites | Switch Off status (as of Nov2017) |
|-------------|----------------------|-----------|-----------------------------------|
| Ch5 | 2018 | 41 | 5 |
| Ch7 | 2018 | 37 | 4 |
| Ch9 | 2018 | 36 | - |
| Ch11 | 2017 | 50 | 1 |
| TPBS | 2018 | 52 | 40 |
| Ch3 | Concession 2020 | 33 | - |

DTTB Network Quality Monitoring Service Availability and Network Auditing



ASO Dates of ASP beneficiary countries

| Country | Year Launch | DTTB | ASO | Revised or year of possibility |
|---------------------|-------------|---------------------|------------|--------------------------------|
| Cambodia | | DVB-T, DVB-T2, DTMB | 2020 | Ongoing |
| Mongolia | 2014 | DVB-T2 | 05/10/2015 | Completed |
| Fiji | 2015 | DVB-T2 | 2018 | Ongoing |
| Indonesia | | DVB-T2 | 2018 | Ongoing |
| Kiribati | | ND | 2017 | |
| Lao P.D.R. | | DVB-T, DTMB | 2020 | |
| Maldives | | DVB-T2, ISDB-T | 2020 | |
| Myanmar | 2013 | DVB-T2 | 2020 | Ongoing |
| Micronesia | | ND | | |
| Thailand | 2014 | DVB-T2 | 2020 | Ongoing |
| Nauru | | ND | | |
| Nepal (Republic of) | | DVB-T2 | 2017 | |
| Philippines | | ISDB-T | 2018 | |
| Papua New Guinea | 2014 | DVB-T2 | 2017 | Ongoing |
| Samoa | 2014 | DVB-T2 | 2018 | Ongoing |
| Sri Lanka | | DVB-T2, ISDB-T | 2017 | |
| Timor-Leste | | ND | 2024 | |
| Tonga | 2015 | DVB-T2 | | |
| Vanuatu | 2016 | DVB-T2 | 2017 | Ongoing |

Source: ITU DSO Database

DTV Receiver: Specification

Mandating DTV Receivers



- DVB-T2 Receiver (including Set-top-box and integrated Digital TV) has to comply with NBTC's DVB-T2 Receiver Specification Edition 2012 and 2013 (Amendment).
- Draft of ASEAN Common Specification and specifications from ASEAN countries has been used as a baseline during developing the above specification.

ASEAN Digital Broadcasting (ADB) initiative to develop common specifications for DVB-T2 receivers

- Self Conformance scheme: Submit test reports to conform and to eligible for conformance Mandating the Digital Receivers sticker and Digital TV Mascot & Logo



Post Regulate

MarCom



NBTC ID and DTV Ready Label

Registration Process and get Approval from NBTC

Submit Reports

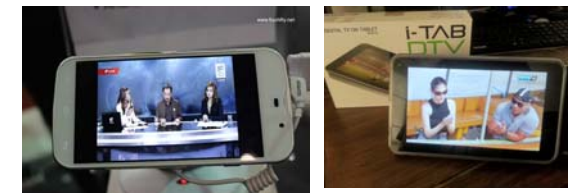
DTV Receiver: Type Approval Sticker



DTT Receiver Type Approval sticker

| Type | Year | | | | | Total |
|--------------------------|---------|------------|-----------|-----------|----------------------|-------------------|
| | 2013 | 2014 | 2015 | 2016 | 2017* (as of Nov) | |
| IDTV | 218,992 | 1,734,973 | 3,468,820 | 3,721,361 | 2,351,592 | 11,495,738 |
| Set-Top-Box | 323,885 | 13,833,709 | 2,642,060 | 79,864 | 344,417 | 17,223,935 |
| Set-Top-Box (car) | - | 18,009 | 27,925 | 14,970 | 7,100 | 68,004 |
| Mobile | - | 1,268,600 | 150,750 | 18,000 | - | 1,437,350 |
| Portable DVD/ TV | - | 8,200 | 17,500 | 15,500 | - | 41,200 |

Source : NBTC



**Portable: Tablet, WIFI, DTV Receiver in Car, Hotspot, Smart Phone with built-in DVB-T2 tuner*



DTV Coupon Subsidy Program

DVB-T2 Receiver Coupon Program

- NBTC set a coupon program as a subsidy measure and distribute cash coupon to every households in Thailand, the subsidy budget for 22.9 million households comes from revenue of Spectrum auction for DTTB Services to support Digital TV Switch-over.
- National Council for Peace and Order (NCPO) Committee approved to utilize some parts of the revenue from auction for DTT Receiver Subsidy Program
- The reserve price portion (15,190 million Bath) from the broadcasting frequency auction was allocated for the program.
- Digital TV coupons worth THB 690 (\$20) for digital TV receivers delivered since October 10, 2014.
- The coupon can be used for Digital Set-Top-Box and iDTV Set with built-in tuners



DTV Coupon Program-Subsidy Campaign



❖ First Phase, 13.57 million coupons were distributed to eligible HHs in 77 provinces with redemption rate 64% or 8.7 million coupons were activated. (as of Jan2016)



❖ Phase 2 : NCPO/Prime Minister approved a proposal from the Office of NBTC to subsidize DTV receiver for 4 groups of households as the follows:

- ❖ Eligible householders of the first lot which did not receive coupons and those coupons were returned to the Office of NBTC by Thailand Post Company.
- ❖ Any Household having house registration document and householder after 16 Sep2014
- ❖ Any households with a house but doesn't has a householder
- ❖ Any households with temporary house registration document

❖ There are additional 3.8 million HHs can get Set-Top-Box, redemption during Mar-Dec2017.

❖ As of Nov2017, Approximately 1 million HHs redeemed.

❖ Easy to get Set-Top-Box at convenient store, retail shop, or register at Post by using Citizen ID.



DSO Communication Strategy and Implementation



DSO Communication strategy



DSO Communication Implementation: Integrated marketing communications (IMC)

- ❖ Communicate on various channels; TV, Radio, SMS, Newspaper, On-Line and Social Media (<https://www.facebook.com/digitaltv.nbtc>), DTV Web site (<http://digital.nbtc.go.th>), Events & Exhibitions, DTV Road show
- ❖ Create media and national message and handbook for promoting DSO
- ❖ Implementing Coverage Checker on web and Mobile/Tablet Applications
- ❖ Build community, local administration to promote DTV
- ❖ Cooperate with Universities, Network Operators, DTV manufactures to support customer on DTV installation
- ❖ Cooperate with DTV broadcasters, telecom operators to promote DTV
- ❖ Encourage high rise building (apartment, condominium) to install DTV antenna
- ❖ Project DTV4All, All4DTV

DSO Communication



DTV Mascot “Nong Doo Dee”



DTV Song <https://www.youtube.com/watch?v=mCVSPaIA8oc>

Mass Communication on TV/Radio



DSO Communication



Music Video
"Change"



DTV
Informative &
Advertorial Scoops

TVC
"DTV Switch
over"



TVC
"Wow... Digital TV"



DTV Info graphic
How to install DTV receiver



DSO Communication

Promoting and Educating Digital TV



Roadshow



DTV Troop



DTV events



DSO Communication

Promoting and Educating Digital TV : Social Media



Website

<http://digital.nbtc.go.th>



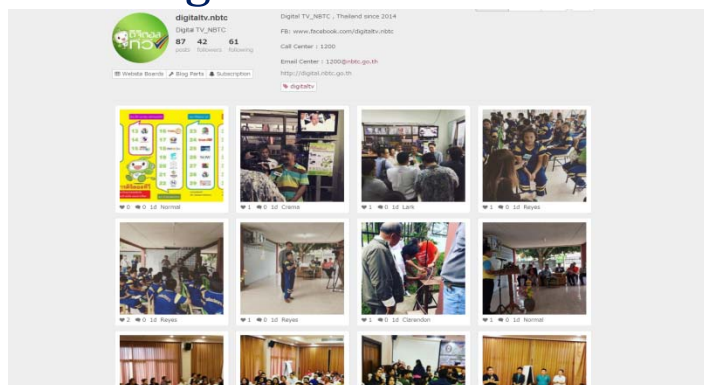
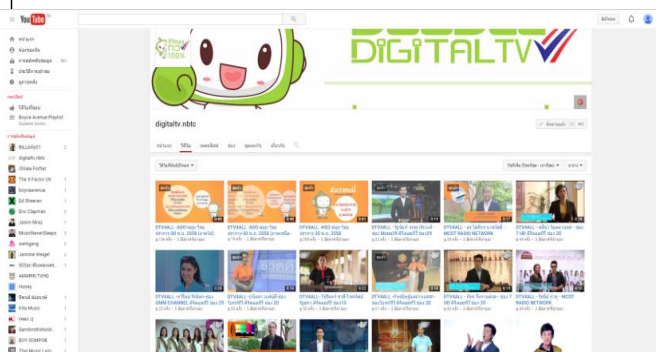
Facebook

(<https://www.facebook.com/digitaltv.nbtc>),



Youtube

Intragram

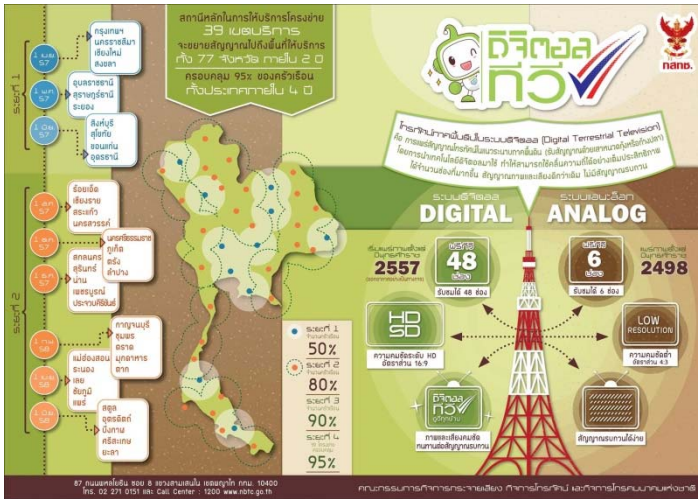


Website : www.nbtc.go.th, digital.nbtc.go.th
Youtube Charnel : digitaltv.nbtc
Facebook : www.facebook.com/digitaltv.nbtc

DSO Communication Promoting and Educating Digital TV



Print medias



Project DTV4all, all4DTV

Handbook: DTV Installation

“ดิจิทัลทีวี ความสำเร็จที่จับต้องได้... ถึงอารมณ...”

ดีเอ็นบีทีซี โทรทัศน์ดิจิตอล

รับชมฟรี 1200 ช่อง

เว็บไซต์: digital.nbt.go.th



“คน! ชัด! จัดเต็ม!!! คุณภาพเป็นเน้น ทุกช่อง... ดิจิทัลทีวี”

ดีเอ็นบีทีซี โทรทัศน์ดิจิตอล

รับชมฟรี 1200 ช่อง

เว็บไซต์: digital.nbt.go.th

48 ช่องฟรี ระบบดิจิทัลทีวี

วิธีการรับชมช่องดิจิทัลทีวี

ระบบด้วยระบบดิจิทัลทีวี

ระบบผ่านระบบดาวเทียมหรือเคเบิล

เว็บไซต์: digital.nbt.go.th / Facebook: www.facebook.com/digitaltv.nbt / YouTube Channel: digitaltv.nbt



Project DTV4all, all4DTV: “Social Media Communication (Viral)”, more than 100 viral clips of influencers and celebrities talking about the digital broadcasting transition spreading via Facebook, Instagram, Youtube etc.



DSO Communication

Cooperate with university, technical college

MOU with Vocational universities in every provinces to support customer on TV installation

DTV Technical Training to technician





DSO Communication

Cooperate with Government agencies

MOU with Royal Thai Army (Network Operator) to build DTV demo set in public local service centers



Governor Monthly update



Customer Support



Call Center 7 days, 24 hrs



Various Call Center Channels

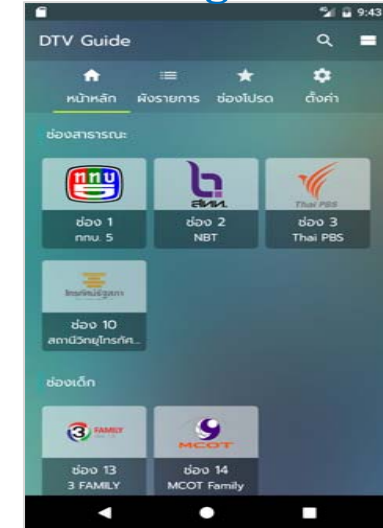
- Phone to Hot line 1200
- Walk-in
- Social Media: FB, youtube
- Website/ Chat/ Web form
- Email
- Fax
- Government Call Center (GCC 1111)
- NBTC sectors/Branch office

Mobile App.Call Center



- Mobile application has been launched in Apr 2015.
- Receive customer complaint with mark location, capable to attach photo/VDO
- Topics raised via application, 90% is information inquiry on DTV, 4G Auctions, and prepaid SIM register, 10% is complaints.

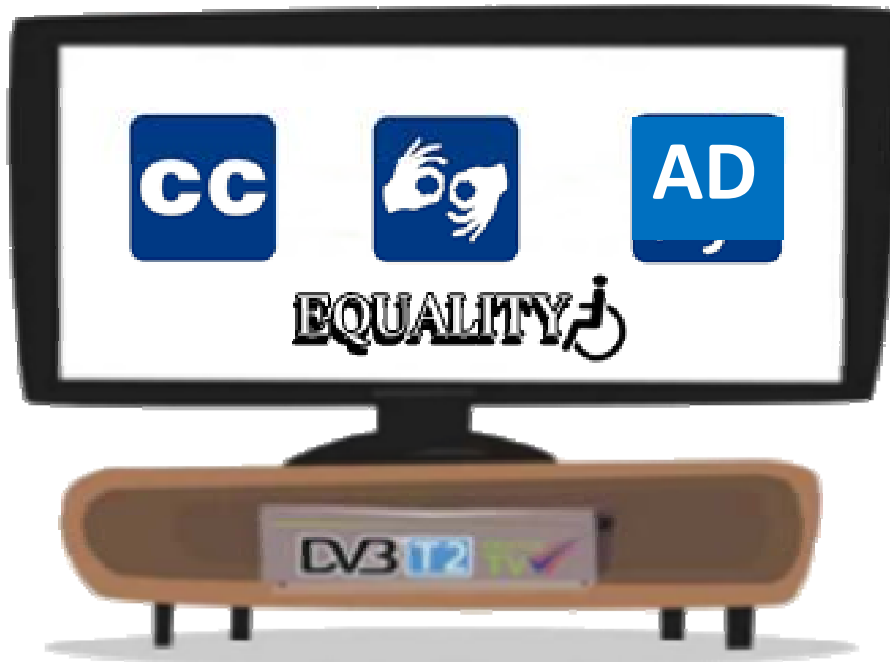
DTV Guide App: DTV Program



Support disability people(PWDs)



The Equality for Disability People



Closed Caption

Sign Language

Audio Description

Contribution documents to ITU-D SG1 Question 8/1



ITU-D Study Group 1: Question 8/1 Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services

Thailand Case Study:
Transition to Digital Terrestrial Television
Broadcasting
Document SG1RGQ/227(Rev.1)-E

Digital Terrestrial Television in Thailand:
Frequency planning and technical aspects
Document SG1RGQ/218-E

Telecommunication
Development Sector



Study Groups
ITU-D Study Group 1 Rapporteur Group Meetings
Geneva, 4 – 15 April 2016

Document [SG1RGQ/227\(Rev.1\)-E](#)
7 April 2016
English only

DELAYED CONTRIBUTION

Question 8/1: Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services
SOURCE: Thailand
TITLE: Thailand Case Study: Transition to Digital Terrestrial Television Broadcasting

Action required: Participants are to consider this contribution.

Keywords: *Transition to Digital Broadcasting, Digital Terrestrial Television, Thailand*

Abstract:

This document provides an overview of Thailand's activities related to transition from analogue to digital broadcasting.

The Thailand's Act on Organisation to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services (2010) stipulates that the National Broadcasting and Telecommunications Commission (NBTC) shall have mandates to put in place a master plan for spectrum management and a master plan for broadcasting in Thailand.

Pursuant to the First Thailand Broadcasting Master Plan (2012-2016), transition from analogue to digital (terrestrial) broadcasting is one of seven strategies of the NBTC. In this regard, the NBTC has developed a roadmap for transition to digital terrestrial TV broadcasting in Thailand. The roadmap defines 39 service areas nationwide and each has 12 channels for Community Services. The total number of DTTB channel is 48 channels, 24 channels are allocated for national Business broadcasting services and 12 channels are allocated for national Public broadcasting services. 5 DTTB networks have been deployed, all operators agreed to share common infrastructure and facilities, network roll out plan target to reach 95% of household coverage within 4 years (2017).

This report consist of background of transition to digital broadcasting, television broadcasting in Thailand, network planning and deployment, service licensing and spectrum auction, receiver and subsidy program, DSO communication, ASD planning and implementation, and lesson learned.

Contact: Name/Organization/Entity: Ms Oranri Srirasa, Office of the National Broadcasting and Telecommunications Commission (NBTC), Thailand
Phone number: +66 86 388 8595
E-mail: oranri.s@nbtc.go.th

Telecommunication
Development Sector



Study Groups
ITU-D Study Group 1 Rapporteur Group Meetings
Geneva, 4 – 15 April 2016

Document [SG1RGQ/218-E](#)
22 March 2016
English only

DELAYED CONTRIBUTION

Question 8/1: Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services
SOURCE: Thailand
TITLE: Digital Terrestrial Television in Thailand: Frequency planning and technical aspects

Action required: Participants are to consider this contribution for inclusion in the final report.

Keywords: *Digital Terrestrial Television, frequency planning, technical aspects, Thailand*

Abstract:

In Thailand, the National Broadcasting and Telecommunications Commission (NBTC) is playing an important role in promoting and implementing the transition from analogue to digital terrestrial television. In 2012, the transition roadmap was developed and DVB-T2 was selected as a national standard for digital terrestrial television (DTT). The technical specifications for DTT transmission, DTT receivers, as well as the first frequency plan were then developed. In 2013, NBTC and broadcasters conducted a field trial for DTT in Bangkok area to find tuning suitable parameter set - a key driver to the new frequency plan, aiming for a coverage target as stipulated in the roadmap. Since then, NBTC has been reviewing and updating relevant technical specifications and the frequency plan, as well as developing DTT technical guidelines.

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Lesson Learned on DSO transition in Thailand

(Country Case Study)



Set up trial

- Trial on the DTT system at the early transition before fully commercial launch was important to test the whole system and trial broadcasting markets.

DTTB Network Rollout

- Sharing infrastructure and facilities
- Ensuring that network rollout, network coverage and network quality of every MUXs are ready to provide broadcasting service the same period for fair competition.
- Regular network quality monitoring
- Setting proper Service Availability, faster recovery, redundancy system/location should be well planned in network design in the first place.
- Utilize existing antenna system and site facilities of existing network operators

Must Carry Rule

- NBTC enforced the rule of 'must carry' for the commercial and public service broadcasters to commence broadcasting DTV content from day one on satellite and cable TV which already cover more than 70% audiences in Thailand to increase DTV eye balls.

Lesson Learned on DSO transition in Thailand

(Country Case Study)



Digital TV Subsidy Program

- Collaboration between the agencies who distribute the set-top-box coupons
- DTV Coupon should be distributed to areas whereas DTTB signal covered.
- DTV coupon value should be enough to cover a qualified set top box with necessary accessories to receive signal
- Proper training for the STB installers prior to distribution of coupon and STB

Receivers

- Collaboration with Vocational school and network operators to help people on STB Receiver Installation, also set up advisory group to support installation.
- Develop application or tool to help the people to equip and tilt the antenna correctly like 'DTV Service Area'
- Having variety of receiver types like portable DTV Receivers e.g. smartphone, tablet, or portable.
- Selecting proper antennas type and model for Set-Top-Box is important to receive signal well.
- Set up advisory group either by dedicated group or volunteer group to support installation.

Collaboration

- Collaboration with industry : ATV and DTV broadcasters, DTTB network operators, manufacturers, retailers
- Collaboration with government agencies and public agencies in national and local level are also key factors to drive a success of digital transition.

Lesson Learned on DSO transition in Thailand



DSO Communication

- Mass communication to public, simply key message
- Getting engagement from government agencies in state and local level, public and relevant. organization.
- Social media Communication such facebook, youtube, twitter

Audience Measurement : Rating of Television Broadcasting

- Rating survey should be conducted to cover all broadcasting platforms including digital platform (i.e. internet) to have real broadcasting rating and user behavior.

Call Center and Information to Support Customer

- Cooperation with DTTB network operators to help people on installation the DTTB receivers, and also build confidence on DTTB network quality.

Capacity Building

- Continuous organizing capacity building on Digital Broadcasting technical, regulation aspects, content development

ITU-D Study Group1: Question 8/1 (study period 2014-2017)



ITU-D Study Group1: Question 8/1

Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services

Final Report Question 8/1 Document 1/419-E

Telecommunication
Development Sector
Study Groups



Fourth Meeting of ITU-D Study Group 1
Geneva, 27 – 31 March 2017

Document [1/419-E](#)
10 February 2017
Original: English

Question 8/1 Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services

SOURCE: Rapporteur for Question 8/1

TITLE: Final Report for Question 8/1

Reference to Documents: [SG1RGQ/277](#), [SG1RGQ/211](#), [SG1RGQ/212](#), [SG1RGQ/274](#), [1/171](#), [1/337](#)

Action required: The participants of the meeting are invited to consider the document as the current version of the Report of Question 8/1 as per the contributions received.

Keywords: *digital broadcasting, transition, report*

Abstract:

This document presents the Final Report for Question 8/1 "Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services" for the study period 2014-2017.

- CHAPTER 1 – Best practices to accelerate the transition from analogue to digital television broadcasting and bridge the Digital Divide with the deployment of new services
- CHAPTER 2 – Communication strategies to accelerate the process of public awareness about digital broadcasting
- CHAPTER 3 – Spectrum issues related to the Analogue Switch-Off process
- CHAPTER4- Use of released spectrum and implement new services and applications
- CHAPTER5-Countries case studies on transition to digital broadcasting and the use of the digital dividend frequency bands

ITU-D Study Group1: Question 8/1

Proposed next Study Period



ITU-D Study Group1: Question 8/1

Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services

Future of Question 8/1 – topics of study

- **Broaden the scope of the question** not restricting it to Analogue to Digital Television Broadcasting:
 - Evolution of the Digital Transition in Broadcasting [DVB-T to DVB-T2, SD to HD, MPEG2 to MPEG4, etc.];
 - Digital Radio (Sound) Broadcasting.
- **Use of the released spectrum** to new services and applications, including collection of case studies and best practice:
 - Bridging the digital divide;
 - Development of rural communications.
- Collection of best practices and countries' experiences on **interference mitigation** between broadcasting and new services;
- Implementation of **new services and applications**:
 - Community and Regional TV on DTV;
 - New Broadcasting Services: 3D, 4K, 8K, etc.; multimedia/interactive services; mobile television.
- **Economic aspects** of the deployment of new broadcasting services and applications:
 - Deployment costs.
- **Impact of other television distribution platforms** (IPTV, Cable, Satellite, etc.) on terrestrial broadcasting market.

ITU-D Study Group1: Question 8/1 (study period 2014-2017)



ITU-D Study Group1: Question 8/1
Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services

Guideline on Digital Communicationn Strategy from Transition from Analog to Digital Terrestrial Broadcasting Document1/421-E

Telecommunication
Development Sector
Study Groups



Fourth Meeting of ITU-D Study Group 1
Geneva, 27 – 31 March 2017

Document [1/421-E](#)
10 February 2017
Original: English

Question 8/1 Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services

SOURCE: Rapporteur for Question 8/1

TITLE: Guidelines on Communications Strategies for the Transition from Analogue to Digital Terrestrial Broadcasting

Reference to Documents: [SG1RGQ/274](#), [SG1RGQ/212](#)

Action required: Participants are invited to consider these Guidelines.

Keywords: *digital broadcasting, transition, communication strategies*

Abstract:

This document contains the Draft Final Guidelines on Communications Strategies for the Transition from Analogue to Digital Terrestrial Broadcasting for Question 8/1.

- CHAPTER 1 –Communication planning to accelerate the process of public awareness about digital broadcasting
- CHAPTER 2 – Information Campaigns for the general public
- CHAPTER3-Media Communication Campaign
- CHAPTER4-Communication strategies targeted low income population

ITU-D Study Group 1: Question 8/1

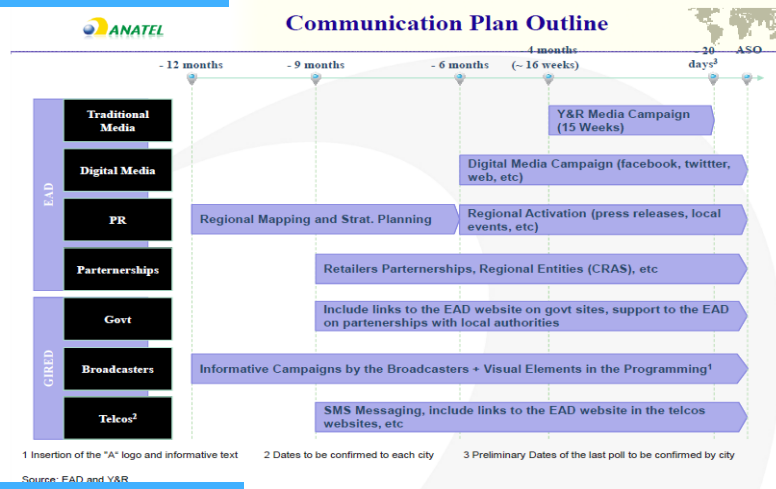
(study period 2014-2017)



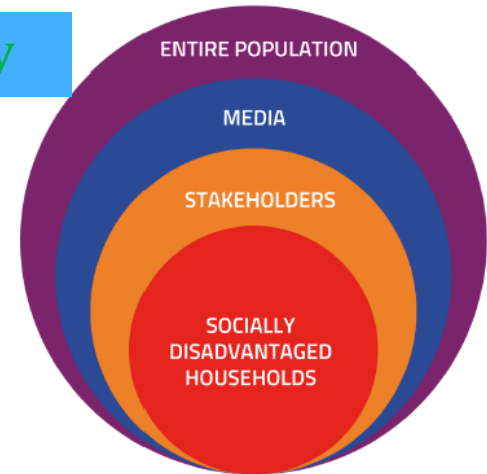
Guideline on Digital Communication Strategy from Transition from Analog to Digital Terrestrial Broadcasting Document 1/421-E

Chapter 1: Communication planning to accelerate the process of public awareness about digital broadcasting

Brazil



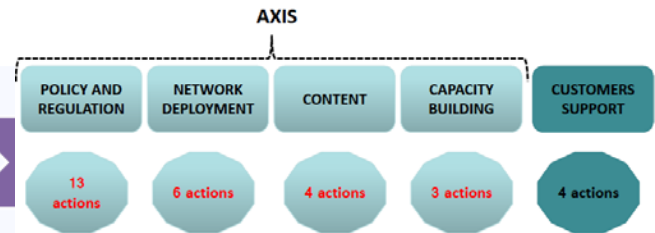
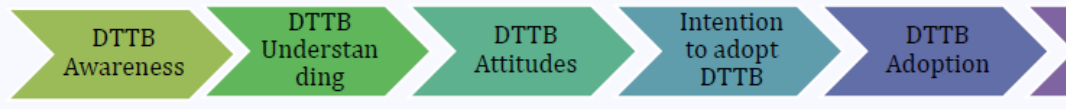
Hungary



Niger

Thailand

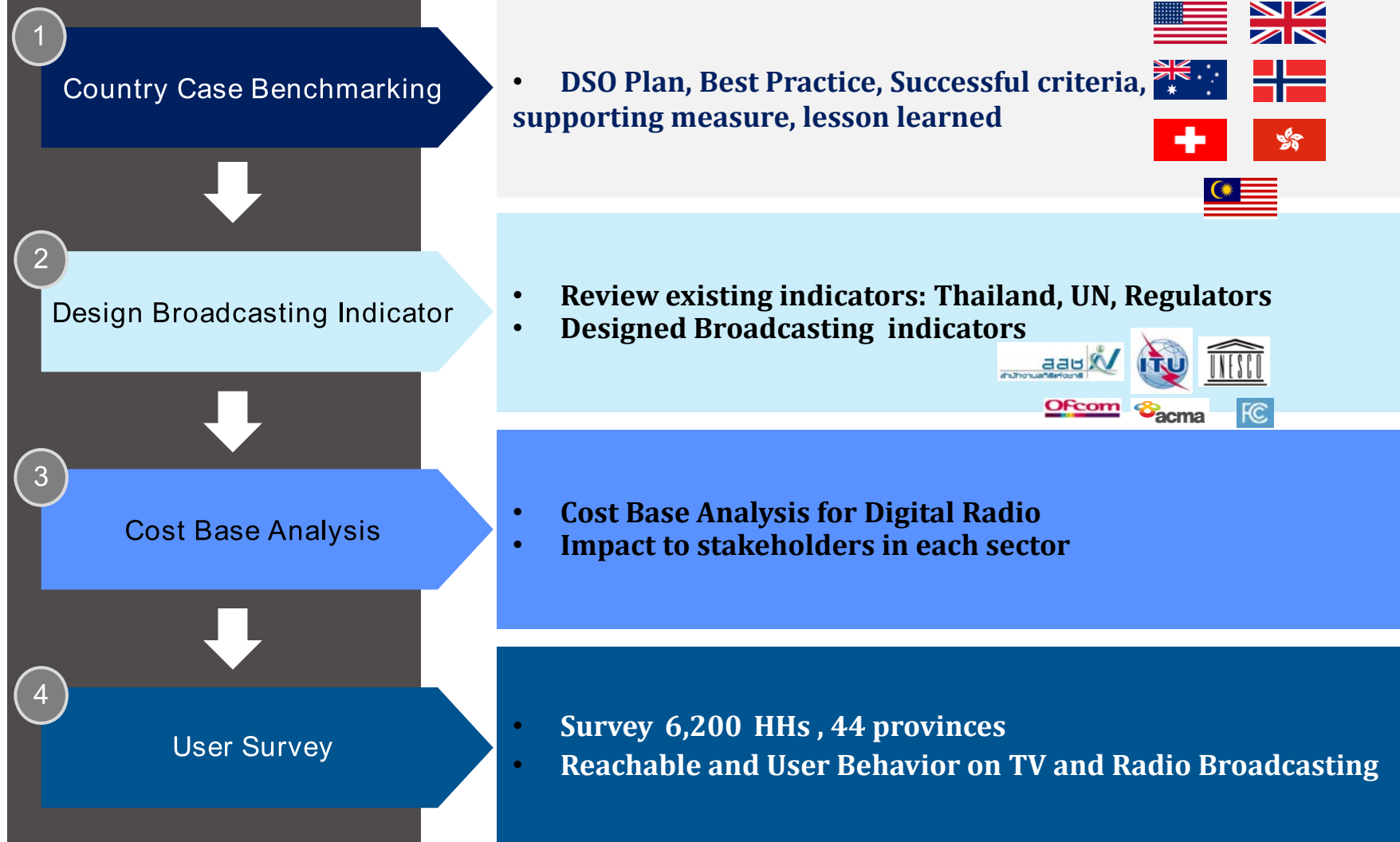
DTTB Communication strategy



Project: Develop Broadcasting Indicators and User Survey



รายงานฉบับสมบูรณ์ โครงการวิจัยตัวชี้วัดและการสำรวจการเข้าถึงบริการโทรทัศน์และบริการกระจายเสียง
<https://broadcast.nbtc.go.th/data/academic/file/600400000003.pdf>



Project: Develop Broadcasting Indicator and User Survey

TV Broadcasting User Survey Result



| Indicators | Survey Result |
|---|---------------|
| 1. Number of Households with TV | 20,433,430 |
| Number of Households with Digital TV | 9,540,172 |
| Number of Households with Analog TV | 14,458,675 |
| 2. Number of Households with DVB-T2 STB | 7,056,303 |
| 3. Number of TV per Household | 1.50 |
| Number of Digital TV per Household | 0.55 |
| Number of Analog TV per Household | 0.96 |
| 4. Number of DVB T2 STB per Household | 0.37 |

| Indicators | Survey Result |
|--|---------------|
| 5. % of Household with TV | 95.8 |
| % of Household with Digital TV | 44.7 |
| % of Household with Analog TV | 67.8 |
| 6. % of Household with DVB T2 STB | 33.1 |
| 7. % of Household viewing digital TV (all platforms) | 84.9 |
| % of Household viewing Terrestrial digital TV | 42.6 |
| % of Household viewing satellite TV | 63.9 |
| % of Household viewing IPTV | 14.9 |
| % of Household viewing digital cable TV | 24.3 |
| 8. % of Household with viewing TV Online | 32.8 |

| Indicators | Survey Result |
|---|---------------|
| 9. % of Household with viewing analog cable TV | 9.6 |
| 10. % of Household with viewing only Terrestrial TV | 12.1 |
| % of Household with viewing only Terrestrial digital TV | 6.6 |
| % of Household with viewing only Terrestrial analog TV | 4.2 |
| 11. % of Household with viewing free satellite TV | 54.8 |
| 12. Number of Households with subscribe cable TV | 7,229,445 |
| 13. Number of Households with subscribe satellite TV | 2,779,405 |
| 14. Number of Households with IPTV | 3,184,423 |
| 15. Number of Households with subscribe TV | 42.1 |
| % of Household with viewing cable TV | 33.9 |
| % of Household with viewing subscribe satellite TV | 13.0 |
| % of Household with viewing IPTV | 14.9 |

Project: Develop Broadcasting Indicator and User Survey

TV Broadcasting User Survey Result

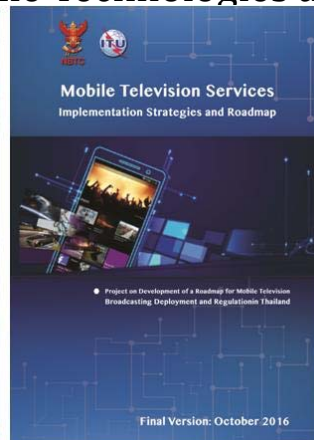
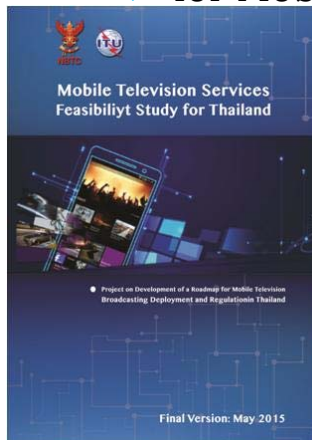


| TV Indicator | Survey Result |
|--|---|
| 1. % of population aged 6+ who watch TV | 98.65 |
| 2. % of population aged 6+ who watch TV weekly | 96.54 |
| 3. Average time spent watching TV per day (mins.) | 122 |
| 4. Average time spent watching Live TV per day (mins) | 128 |
| 5. Average time spent watching Time-shifted TV per day | 95 |
| 6. Average time spent watching TV by day part | 06.01 - 12.00 = 100 12.01 - 18.00 = 111 18.01 - 23.00 = 151 23.01 - 06.00 = 86 |

NBTC/ITU Digital Broadcasting Project: Mobile TV



- ❖ NBTC, ITU collaboration on project: *Development of a Roadmap for Mobile TV Broadcasting Deployment and Regulation in Thailand*
 - ❖ **Mobile Television Services Feasibility Study for Thailand**
 - ❖ **Mobile Television Services Implementation Strategies and Roadmap for Thailand**
 - ❖ Spectrum management aspects
 - ❖ Technical and operational aspects
 - ❖ Business and regulatory aspects
 - ❖ Regulatory impact assessment
 - ❖ Conclusions, recommendations and roadmap
- <https://broadcast.nbtc.go.th/academic/?type=NTYwNTAwMDAwMDAy>
- ❖ **Capacity Building:** Workshop/Conference, focus group
 - ❖ -NBTC/ITU ASP Regional Seminar on 'Delivery Technologies and Business Models for Mobile Technologies and Multimedia Services'



NBTC/ITU Digital Broadcasting Project: Mobile TV

Report :Mobile Television Services Feasibility Study for Thailand

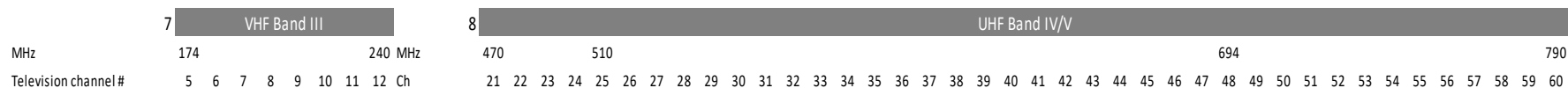


| <i>System</i> | <i>In commercial operations?</i> | <i>Option for Thailand?</i> |
|------------------------------|--|--|
| T-DMB/AT-DMB | Yes , T-DMB only. For example in Korea, Ghana & China | Yes , VHF Band III (in-band with DAB) |
| ATSC-M/H (in-band system) | No , tested in the USA and Canada (2013) | No , DTTB is DVB-T2 |
| ISDB-T 1Seg (in-band system) | Yes , for example in Japan, Brazil, Costa Rica & Chile | No , DTTB is DVB-T2 |
| ISDB-Tmm | No , in Japan only, to be discontinued 30 June '16 | Yes?, VHF Band III |
| DVB-H | No , all DVB-H services discontinued | No , discontinued |
| DVB-T2 Lite (in-band system) | No , only tested, for example in the UK and Italy (2012/13) | Yes , VHF III, UHF IV/V (in-band with T2) |

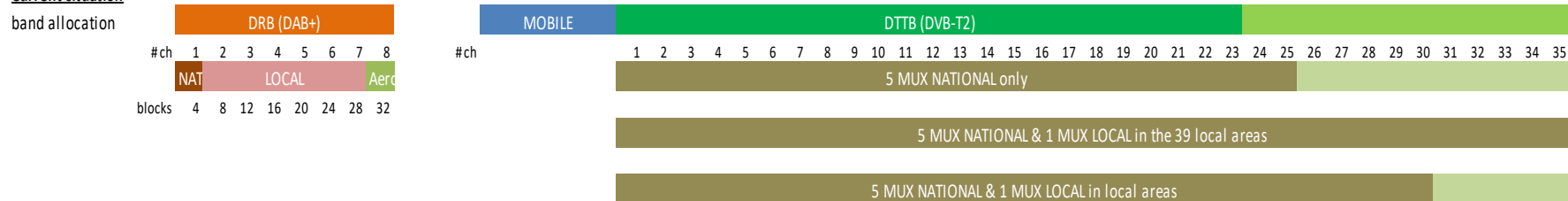
<https://broadcast.nbtc.go.th/data/academic/file/580900000003.pdf>

NBTC/ITU Digital Broadcasting Project: Mobile TV

Report : Mobile Television Services Feasibility Study for Thailand



Current situation



Future scenarios



Aero = Allocation for Aeronautical services (2 blocks can not be used for DRB/MTV)

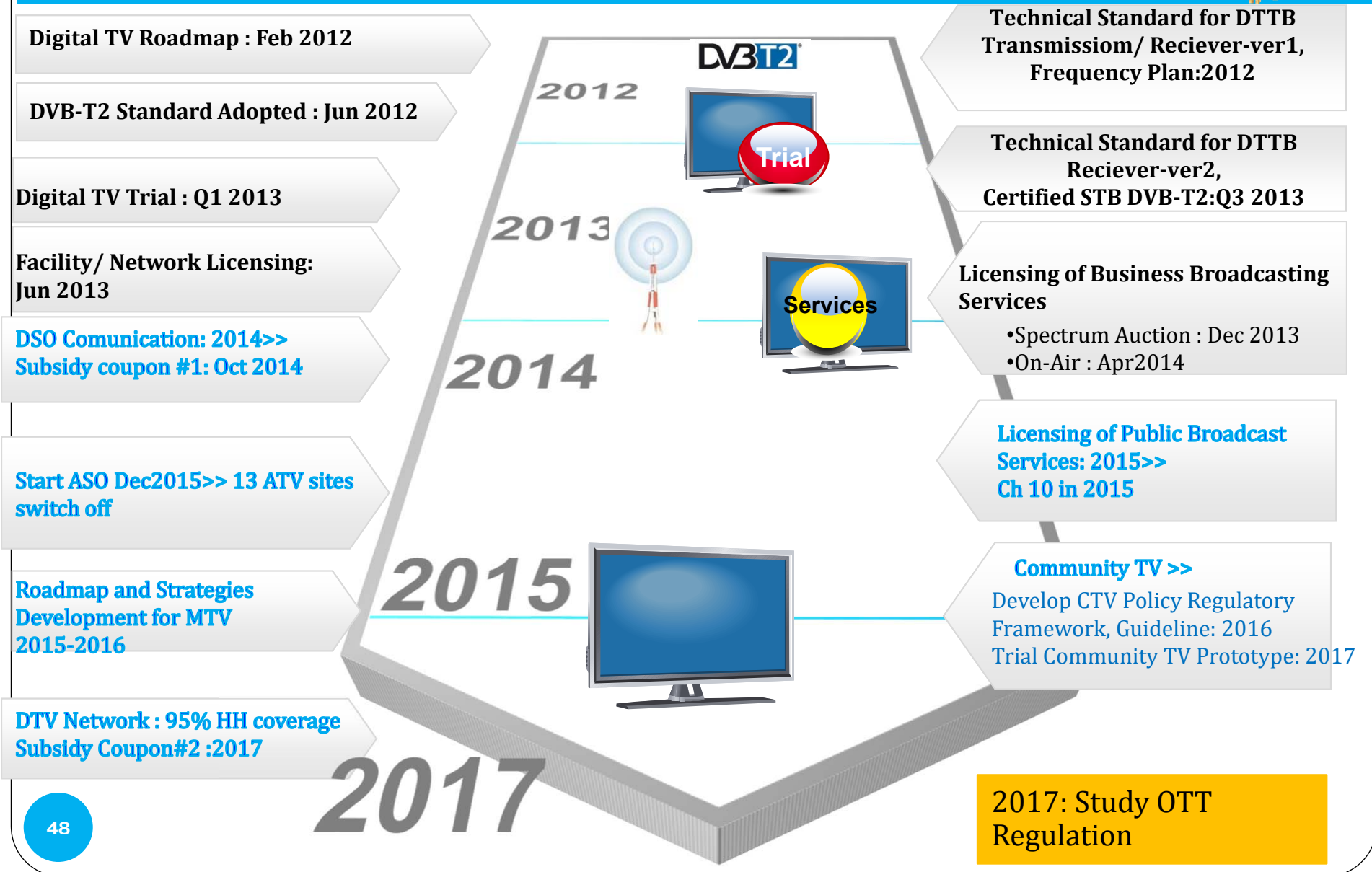
MTV = Allocation for MTV services

NATIONAL = Allocation for National DRB services

LOCAL = Allocation for local DRB services

MUX NATIONAL & 1 MUX = Allocation for national and local DTTB services

Summary DSO in Thailand



Thank You



Website: www.nbtc.go.th, digital.nbtc.go.th

Youtube Channel: digitaltv.nbtc

FaceBook: www.facebook.com/digitaltv.nbtc

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