



Digital TV and DTTB in Thailand

Global Update & Overview of ITU work

12 December 2017

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Agenda

Topics

1. Global update on Digital TV
2. ITU/NBTC joint DTTB implementation
3. Key lessons learned

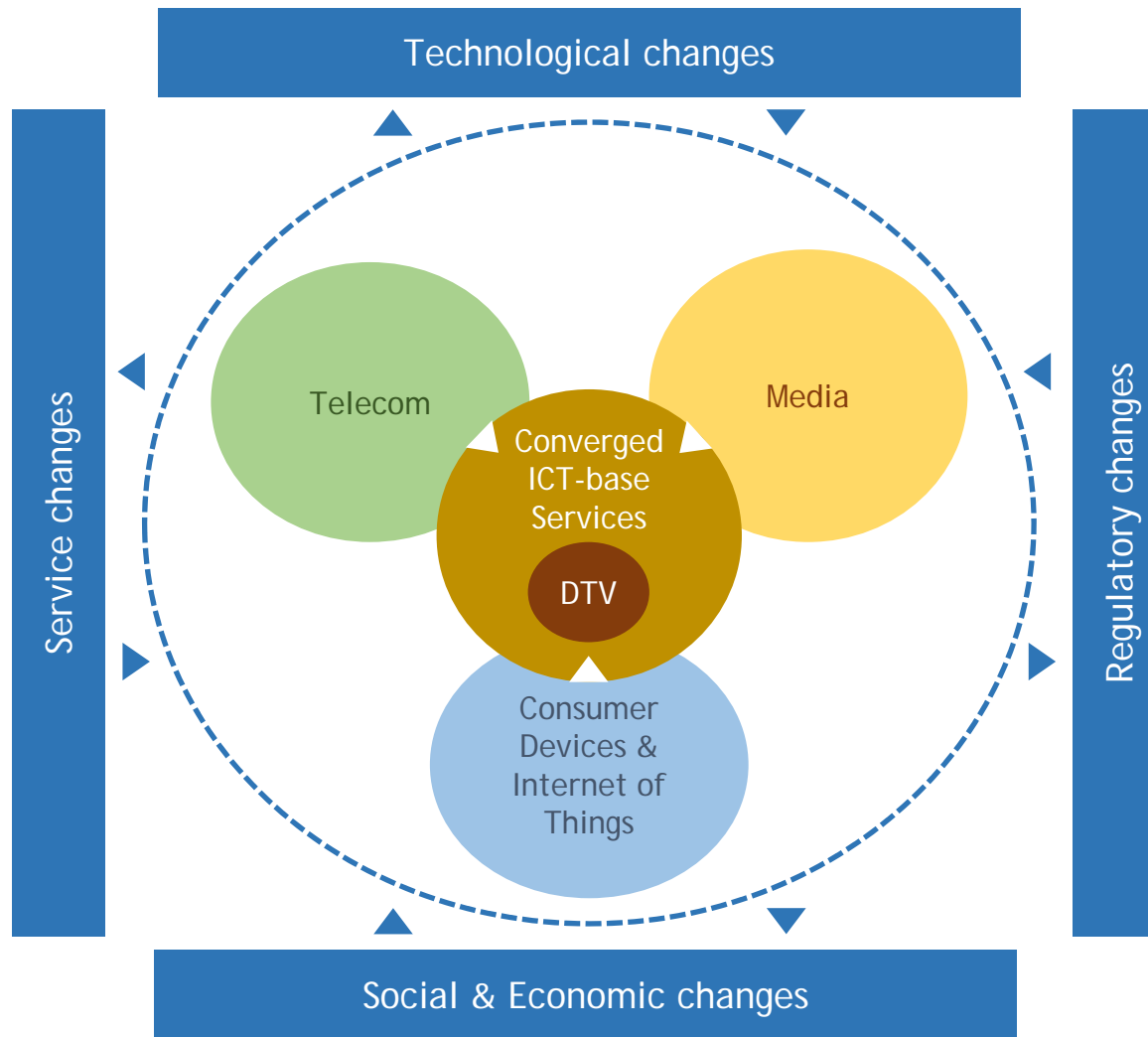


1. *Global update on DTV*

- DTV context
- Service trends
- Regulatory trends

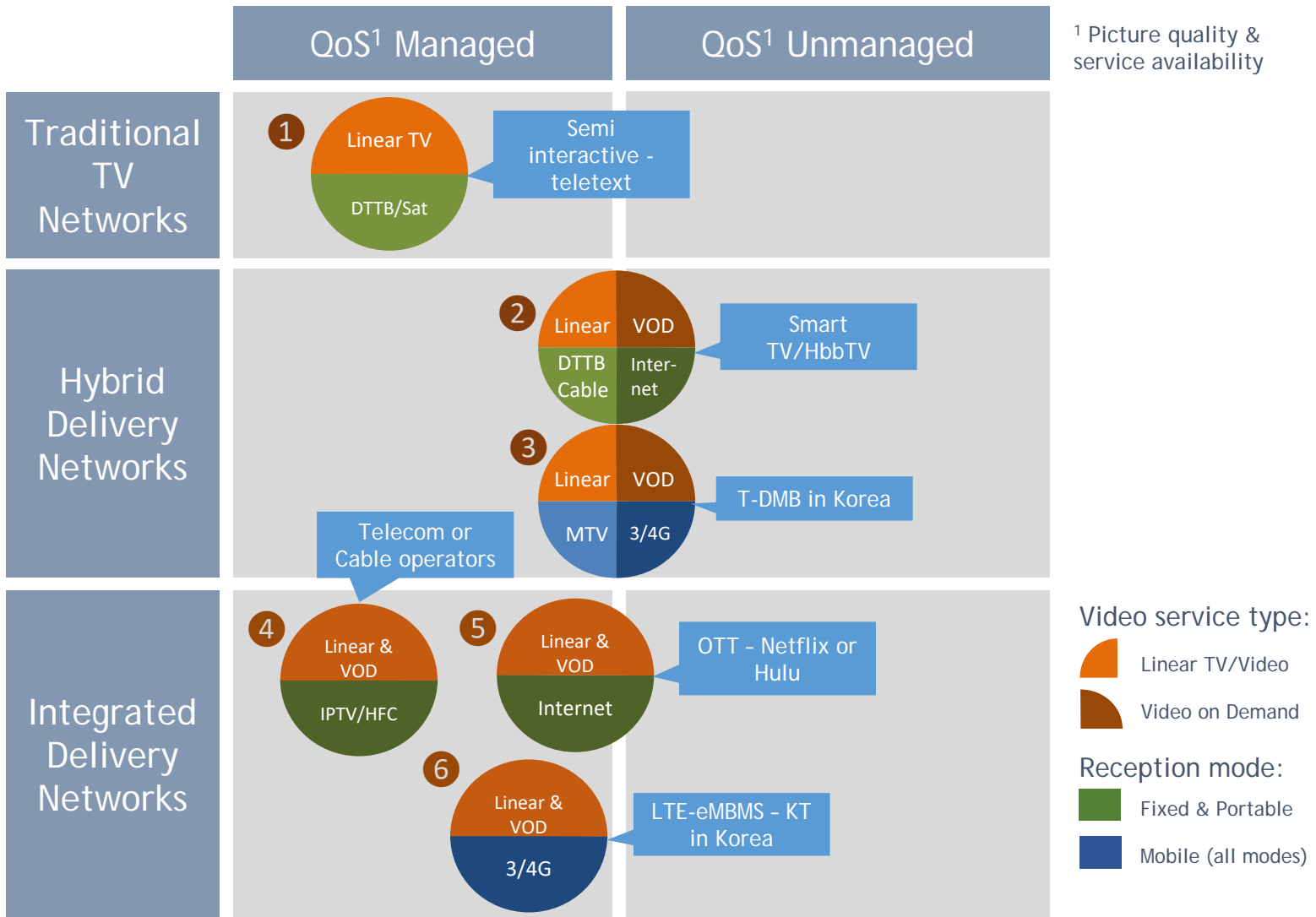
1. Global update on DTV

DTV context



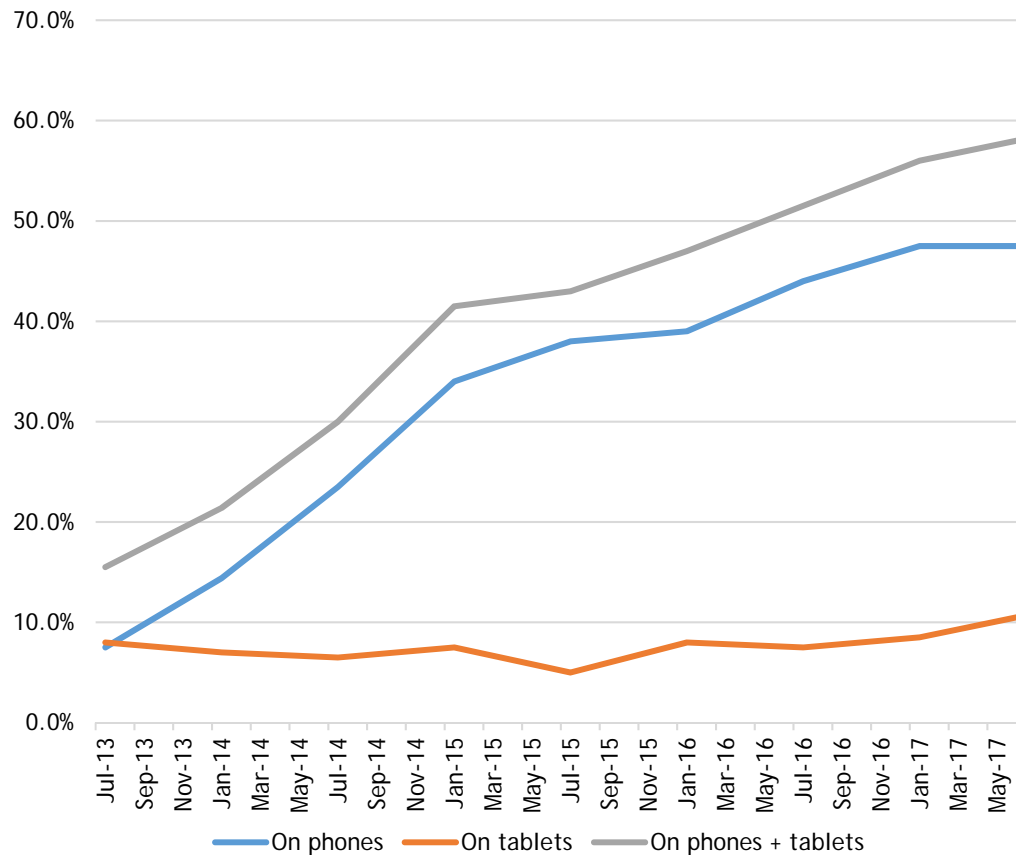
1. Global update on DTV

DTV context



1. Global update on DTV

Service trends: Video anywhere & anytime

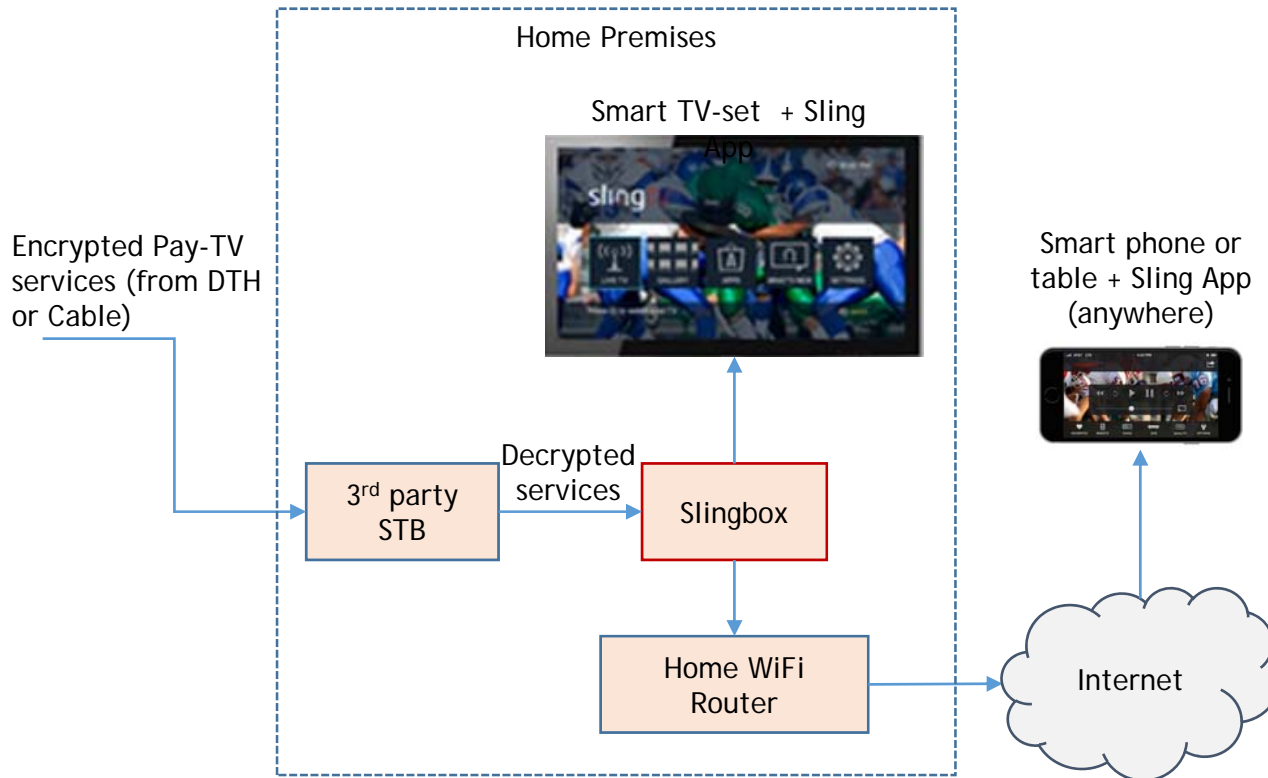


Source: Ooyala Global Video Index Q2 2017, adapted

- Video anywhere & anytime = mainly short-form video on mobiles
- Is video watching on mobiles cannibalising TV revenues?
 - Idle time (when on the move) is used
 - TV is long-form video
 - 4k/8k (UHDTV) viewing
 - Changed viewing patterns
 - Media meshing

1. Global update on DTV

Service trends: Video anywhere & anytime

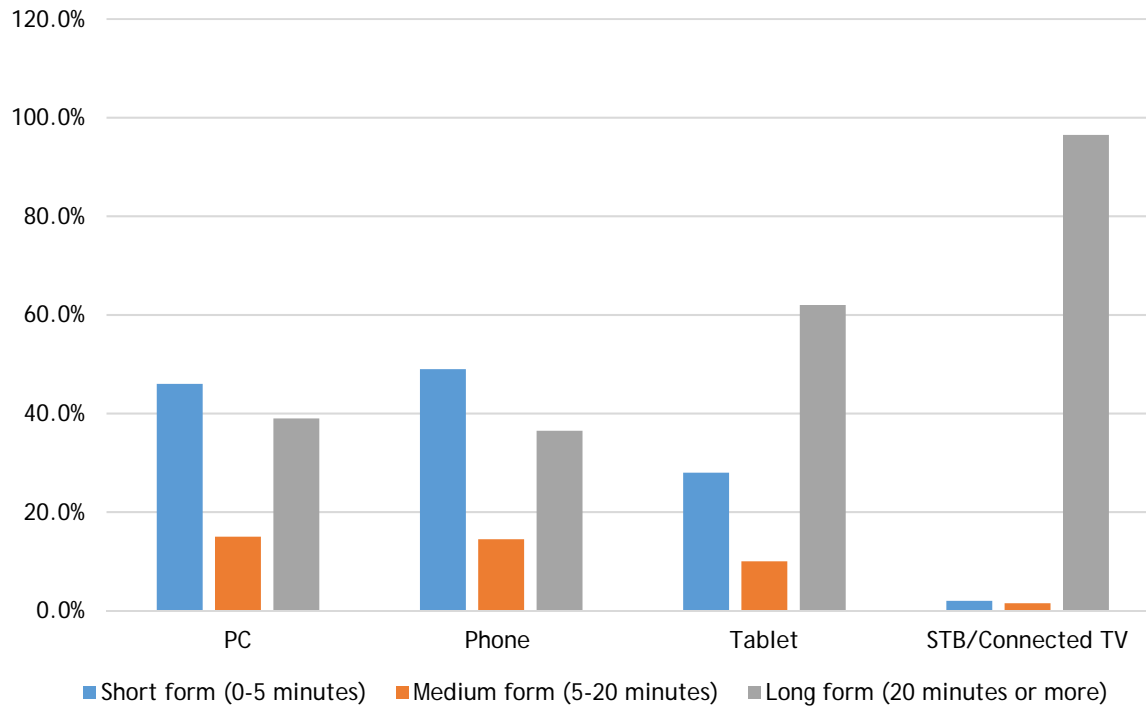


Source: Sling Media

- The 'Slingbox' was initially a device offering
- Video service IP-redistribution is a standard offering of IPTV and Cable TV service providers
- New redistribution concepts keep appearing (some illegal) and pose IPR and regulatory challenges

1. Global update on DTV

Service trends: Video anywhere & anytime

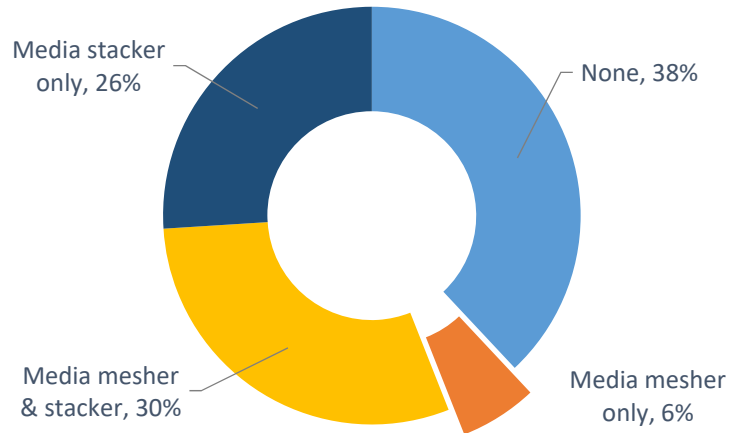


- Predominantly short-form video viewed on mobiles
- Connected TV sets are used for long-form video
- Connected TV set penetration is rapidly growing:
 - Integrated TV sets
 - Dongles

Source: Ooyala Global Video Index Q2 2017, adapted

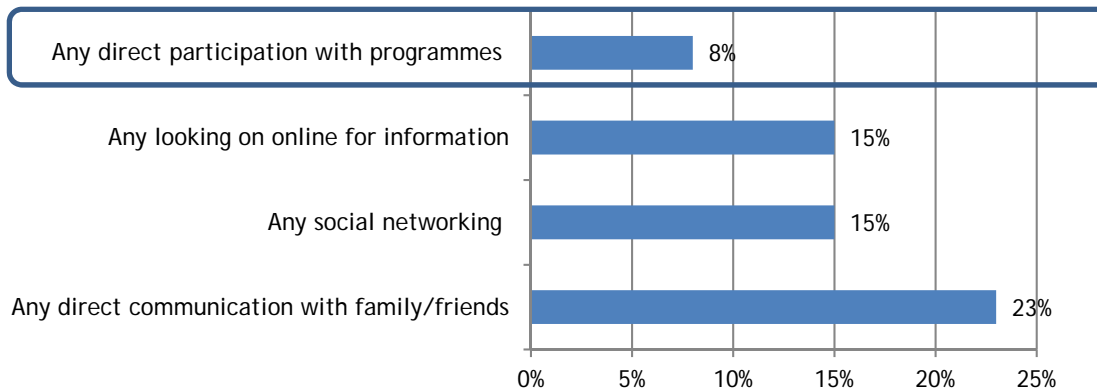
1. Global update on DTV

Service trends: Multi-screen & media meshing



Source: Ofcom

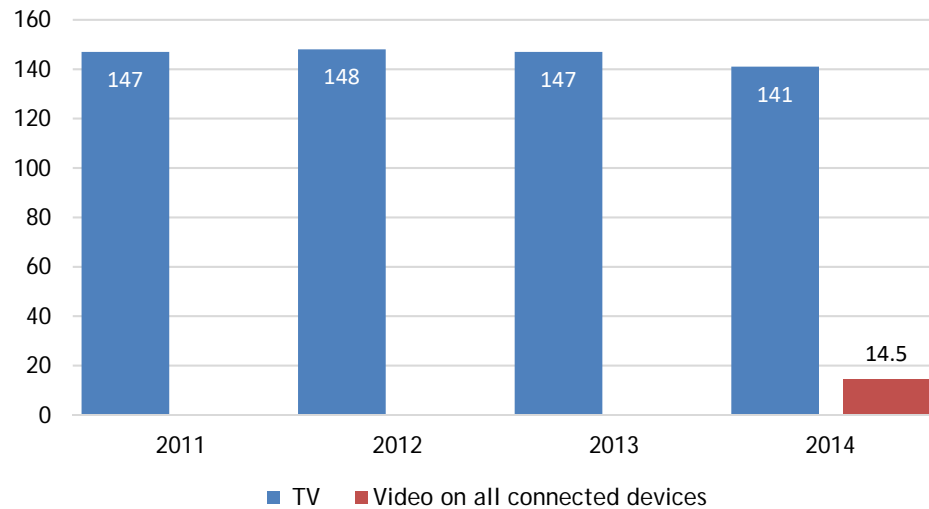
- Most multi-screen usage is media staking, which can cannibalise revenues
- True media meshing is still limited
- Media meshing can increase:
 - Customer loyalty
 - Revenues



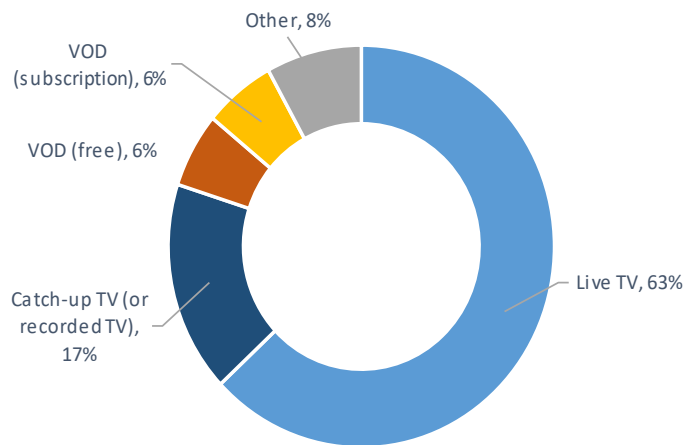
Source: Ofcom

1. Global update on DTV

Service trends: OTT and traditional viewing



Source: Nielsen US

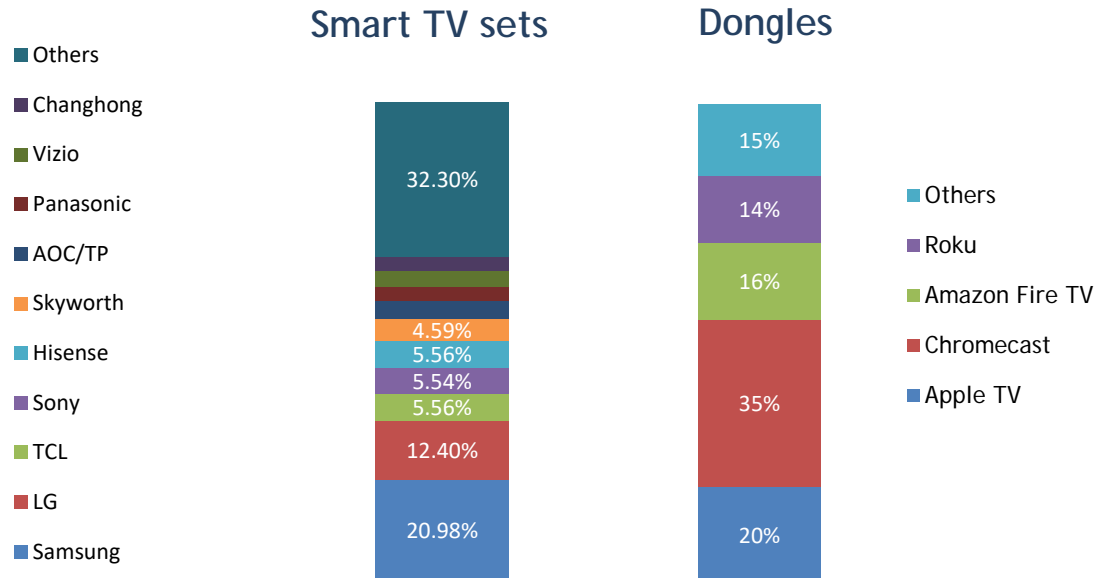


Source: Digital UK

- OTT impact slower than anticipated in US (and elsewhere)
- Also in Europe, as shown by EBU 2015 study:
 - 95.5% live viewing
 - 4.5% time shifted viewing
- Digital UK and RTL Germany also showed (2017):
 - 80% of viewing is live and recorded TV (via traditional delivery)

1. Global update on DTV

Regulatory trends: Eco-system access & connected TV

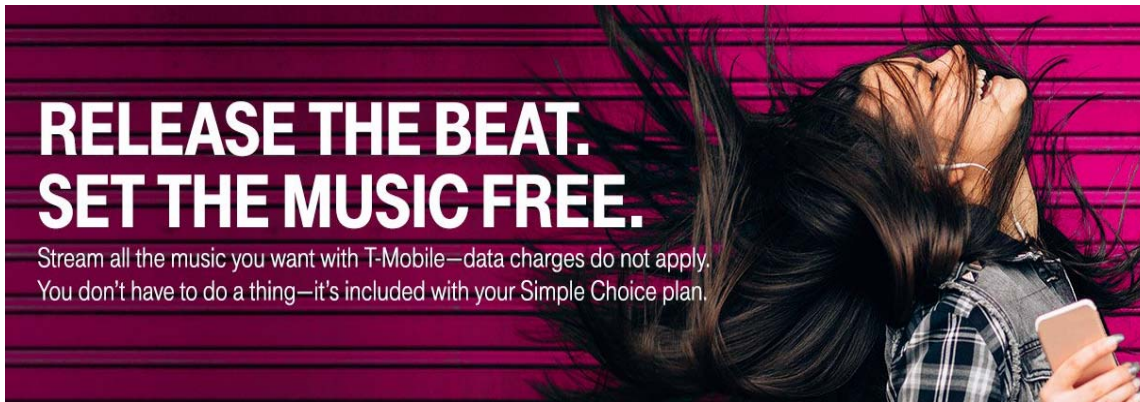


Source: Statista, Strategy Analytics, 2016

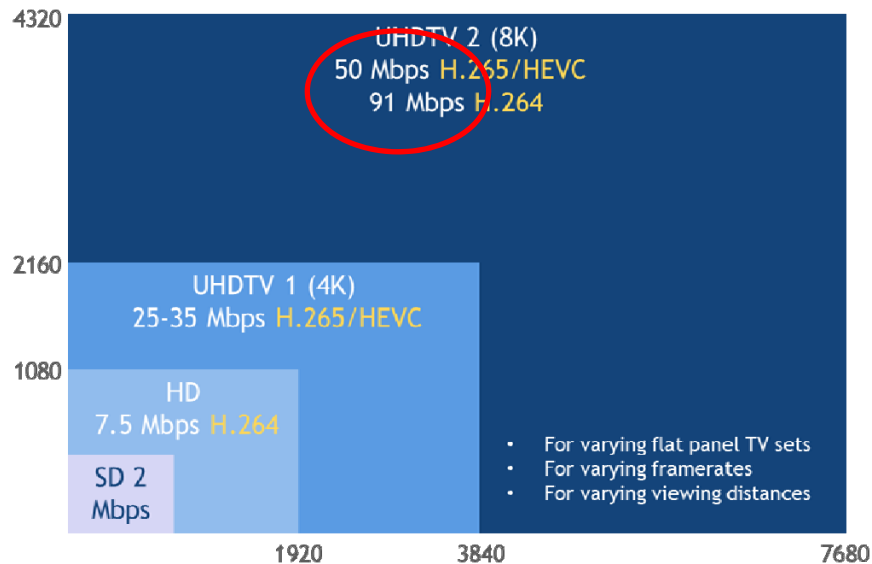
- Providing access to TV Apps (TV eco-system) can be critical, however:
 - Competition is fierce
 - Standardisation helps
- Latest Eco-system dispute:
 - Sep 2017: Google pulled YouTube access from Amazon's Echo Show (= smart speaker)
 - Dec 2017: Amazon not selling Google's Chromecast and Home products

1. Global update on DTV

Regulatory trends: Net neutrality & audio-visual services



Source: T-Mobile



- AV zero-rating offerings are currently attracting regulatory attention:
 - Offerings can constitute a violation of net neutrality rules
 - Rulings in US and Europe vary
- The KT/Samsung 2012 dispute may repeat itself in the future:
 - Mature production of 4k/8k content & services
 - Connected 4k/8k TV sets will accelerate broadband demand

1. Global update on DTV

Regulatory trends: Local AV content requirements



Source: European Council

- AV content requirements should be (as much as possible) technology-neutral
- Regulating non-linear services poses two challenges:
 - No natural capacity constraint
 - More degree of control
- In EU regulatory cornerstone = AV Media Service Directive (AVMSD)
- AVMSD currently under review:
 - Scope includes now social media services (User Generated Content)
 - Advertising rules more relaxed (20% rule only between 07:00-23:00)
 - Relaxing of product placement & sponsoring rules (by self-regulation)
 - VOD SPs to provide at least 30% local content

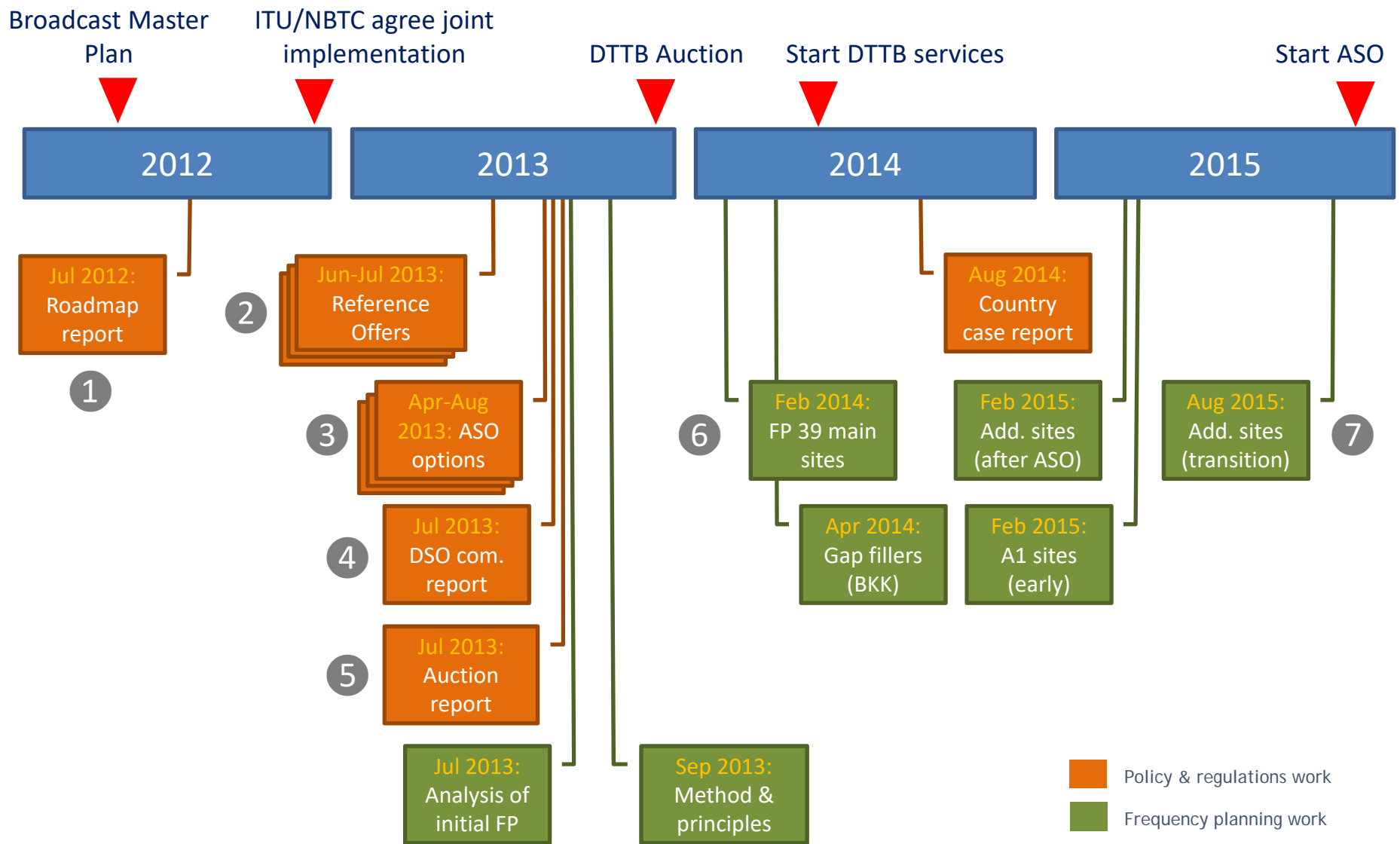


2. *ITU/NBTC joint DTTB implementation*

- Overview of key deliverables

2. ITU/NBTC joint DTTB implementation

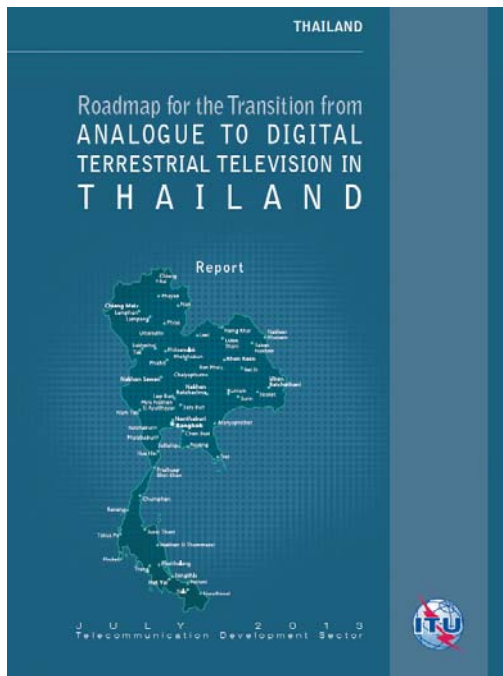
Overview of key deliverables



2. ITU/NBTC joint DTTB implementation

1 Roadmap report

- Thailand Roadmap report based on the ITU Guidelines for the Transition from analogue to digital broadcasting (versions 2010, 2012 and 2014)
- 5 functional layers with in total over 40 functional building blocks



layer 1

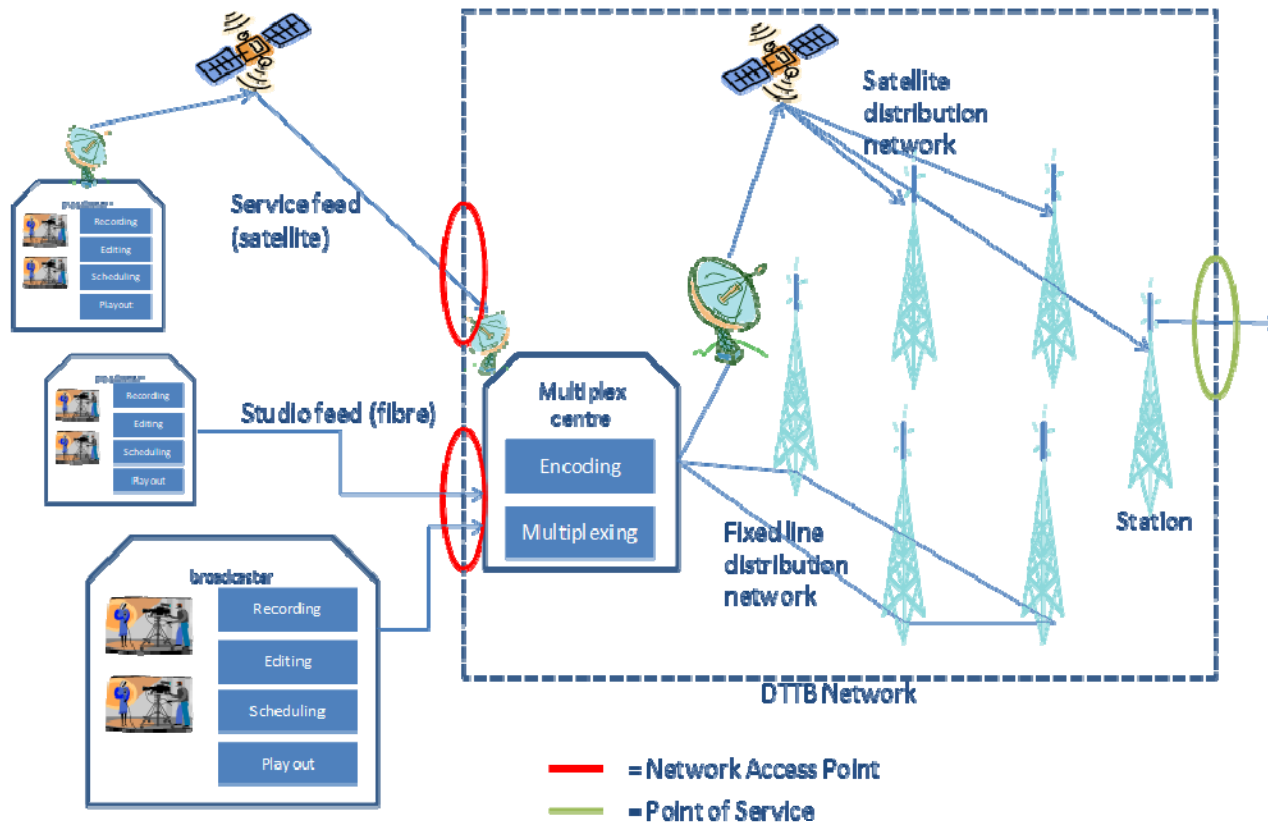
Policy & Regulation	2.1. Technology & Standards Regulation	2.2. Licensing Framework	2.3. ITU-R Regulations		
	2.4. National Spectrum Plan	2.5. Assignment Procedures	2.6. License Terms & Conditions	2.7. Local Permits (building & planning)	2.8. Media Permits & Authorizations
	2.9. Business Models & Public Financing	2.10. Digital Dividend	2.11. National Telecom, Broadcast & Media Acts	2.12. Law enforcement & execution	2.13. Communication to consumers & industry

layer 4

Networks	DTTB		MTV			
	4.1. Technology & Standards Application	4.2. Design Principles & Network Architecture	4.4. System Parameters	4.6. Network Interfacing	4.8. Transmitting equipment Availability	4.9. Network Rollout Planning
	4.3/5.3. Network Planning	4.5/5.5. Radiation Characteristics	4.7/5.7 Shared & Common Design Principles			
	5.1. Technology & Standards Application	5.2. Design Principles & Network Architecture	5.4. System parameters	5.6. Network Interfacing & studio facilities	5.8. Transmitting equipment Availability	5.9. Network Rollout Planning

2. ITU/NBTC joint DTTB implementation

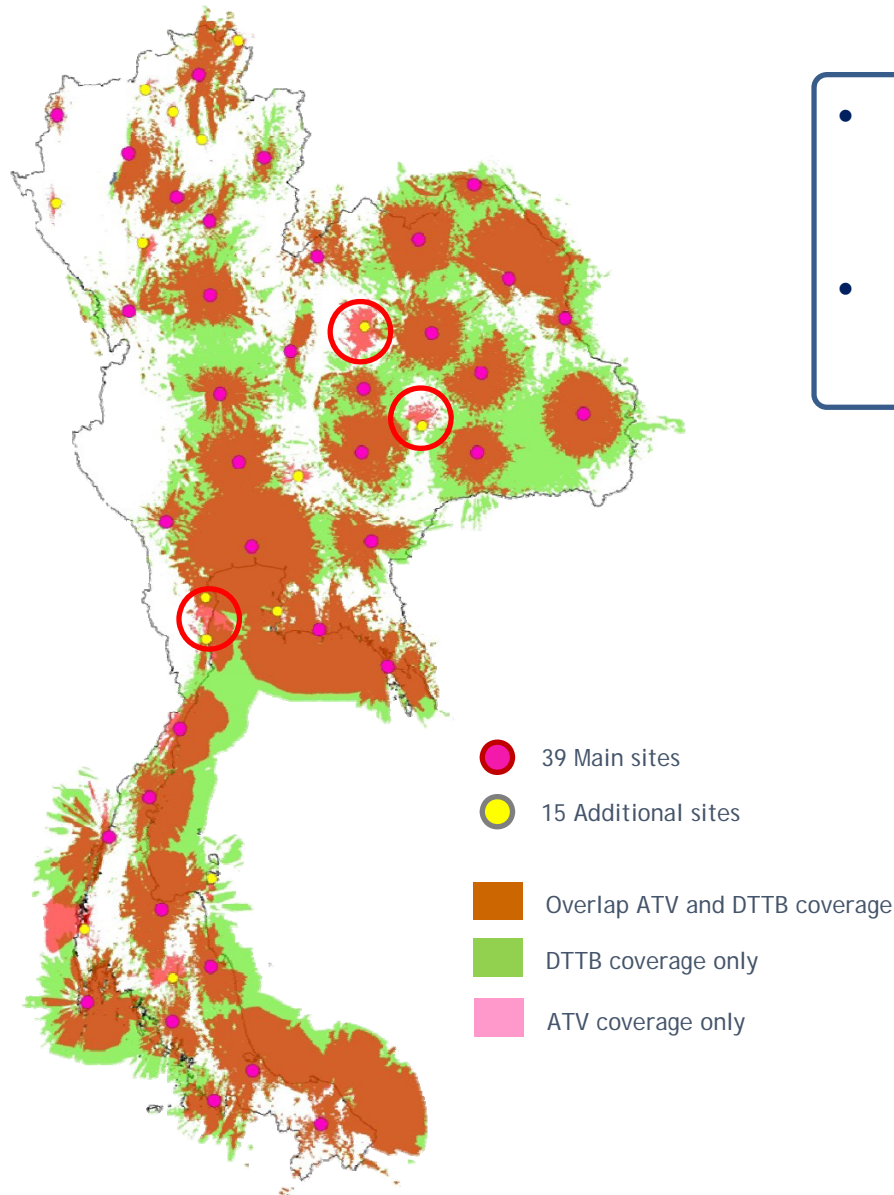
2 Reference Offers



- RO is a binding offer from the network operators, defining:
 - Service
 - Service levels
 - Pricing
- RO to be published and NRA approved before auction
- Pricing is often based on LRIC model

2. *ITU/NBTC joint DTTB implementation*

3 *ASO options (2/2)*

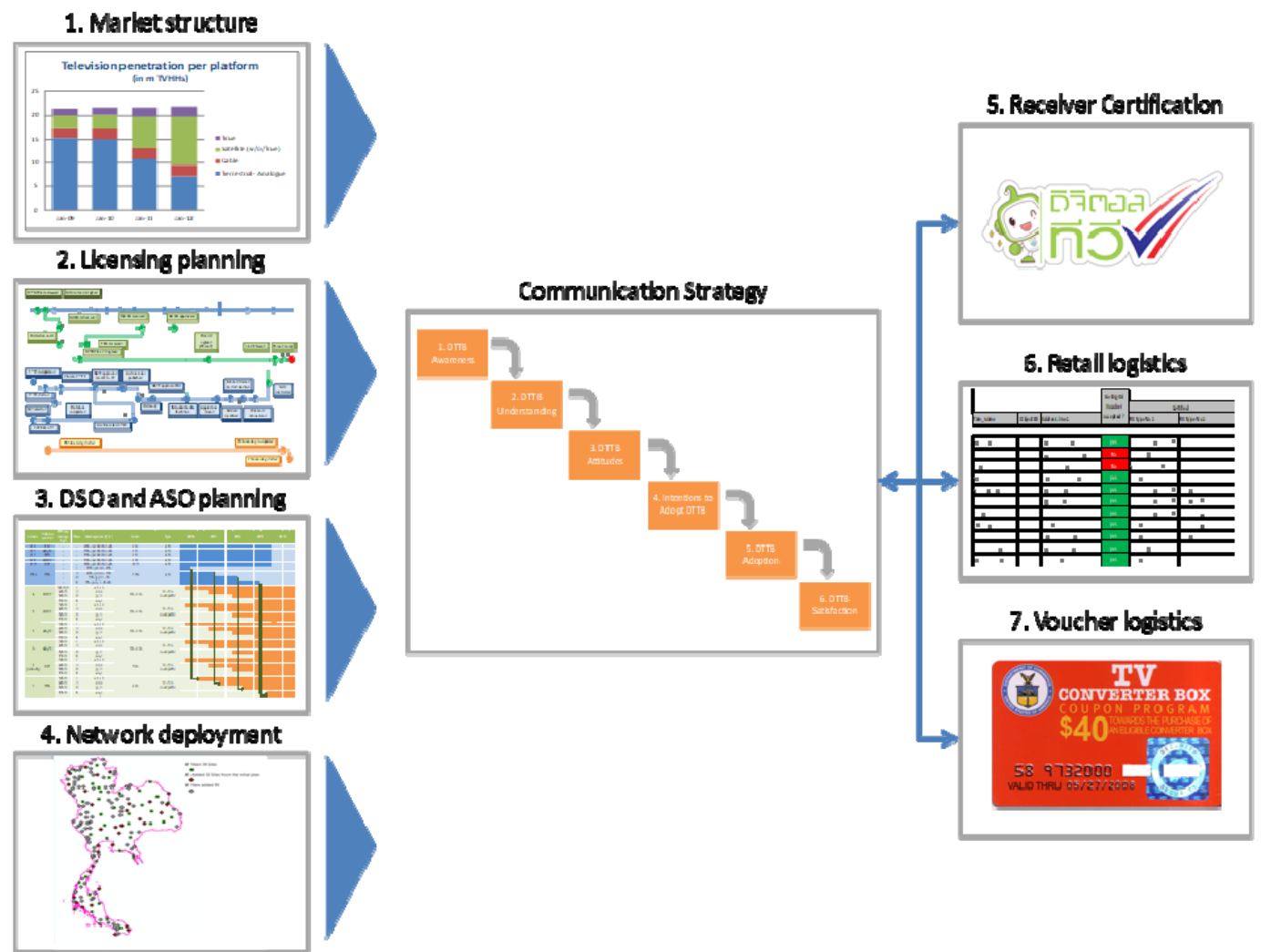


- Detailed frequency planning necessary to assess impact on ATV viewers
- Per ATV network and per roll-out stage

2. ITU/NBTC joint DTTB implementation

4 DSO communications

DSO communications strategy



2. ITU/NBTC joint DTTB implementation

4 DSO communications (2/2)

Tracker board for monitoring DSO progress

DSO Progress report			DATE												
Prov_code	Province Name	Uther name	Phase 1	Phase 2	Phase 3	Phase 4	Base size	1. DTTB Awareness		2. DTTB Understanding				3. DTTB Attitudes	
								a. DSO Intro	b. Logo	a. What to do for DSO	b. 2nd set limitation	c. VCR/DVDR limitation	d. Phase 1 date	a. Overall opinion	b. Personal comfort
			0/100%				100%	100%	0%	0%	0%	0%	100%	100%	
1	BANGLADESH						100%	100%	100%	100%	100%	100%	100%	100%	
2	BHUTAN						100%	100%	100%	100%	100%	100%	100%	100%	
3	INDONESIA						100%	100%	100%	100%	100%	100%	100%	100%	
4	KAMPANGA STATE						100%	100%	3%	4%	5%	0%	30%	12%	
5	LAOS						100%	100%	100%	100%	100%	100%	100%	100%	
6	MYANMAR						100%	100%	100%	100%	100%	100%	100%	100%	
7	NEPAL						100%	100%	100%	100%	100%	100%	100%	100%	
8	PHILIPPINES						100%	100%	100%	100%	100%	100%	100%	100%	
9	RUSSIA						100%	100%	100%	100%	100%	100%	100%	100%	
10	THAILAND						100%	100%	100%	100%	100%	100%	100%	100%	
11	VIETNAM						100%	100%	100%	100%	100%	100%	100%	100%	
12	YEMEN						100%	100%	100%	100%	100%	100%	100%	100%	
13	ZAMBIA						100%	100%	100%	100%	100%	100%	100%	100%	

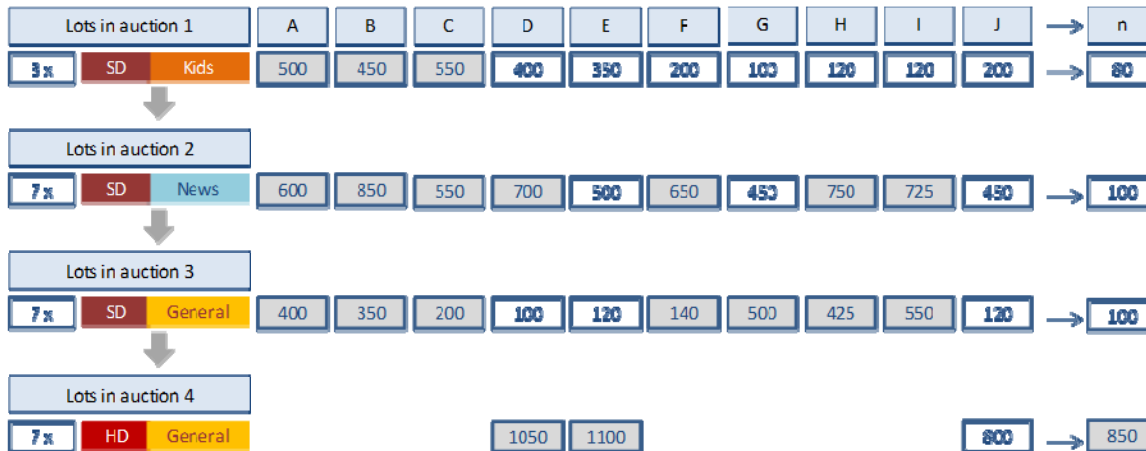
2. ITU/NBTC joint DTTB implementation

5 Auction

Lot definition and number of lots in each category



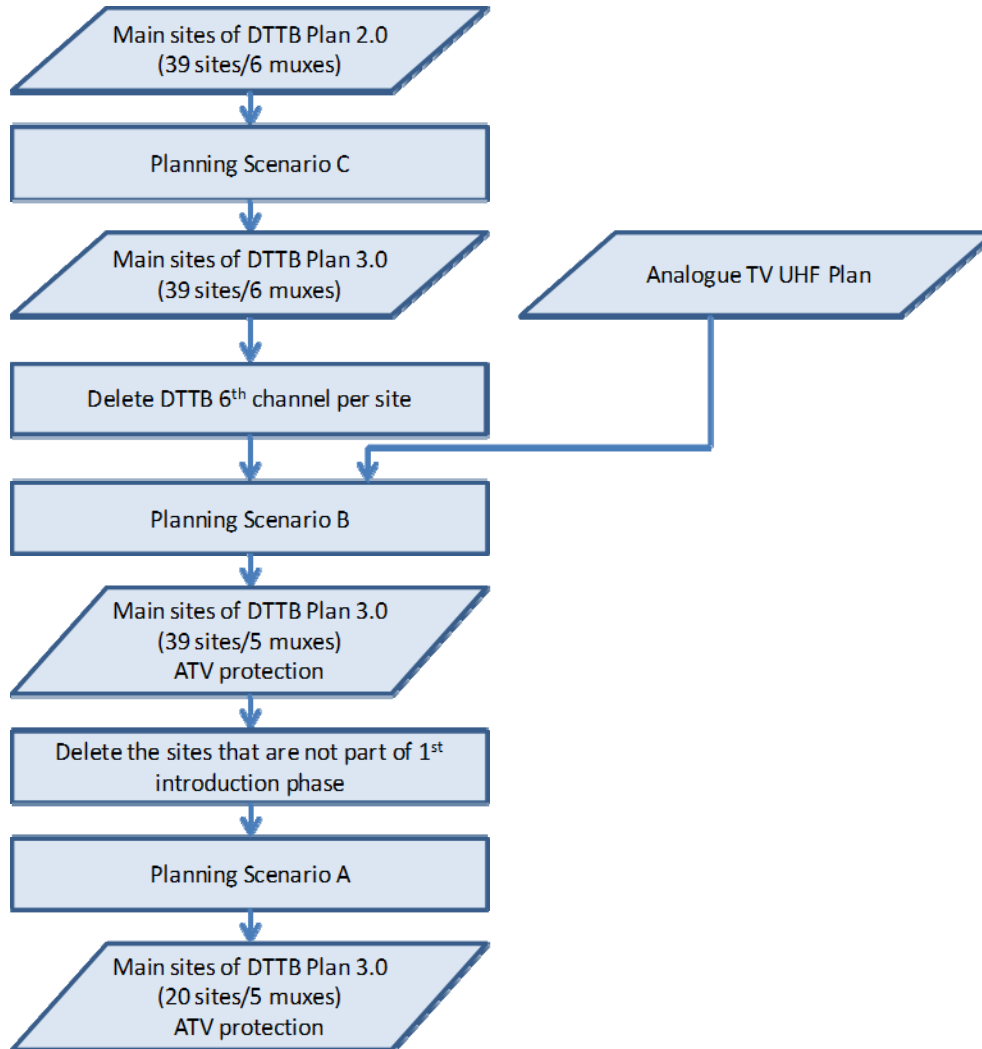
Consecutive auction for each category



- Key action design issues:
 - Definition of auction lots (NO to be included in lot?)
 - Consecutive auctions or combinatorial auction
 - Auction bidding rules (fixed bid increments + given auction duration)

2. ITU/NBTC joint DTTB implementation

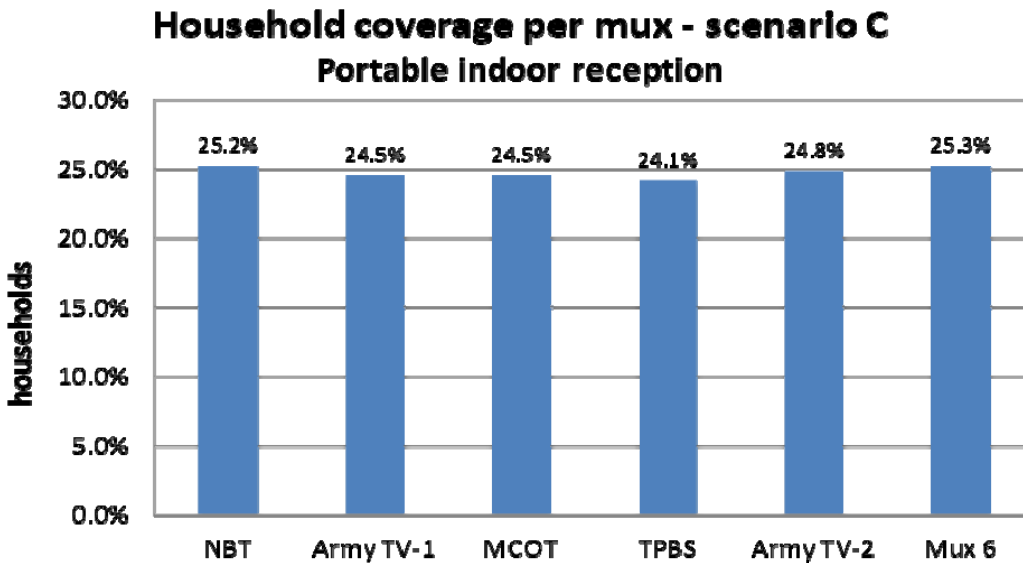
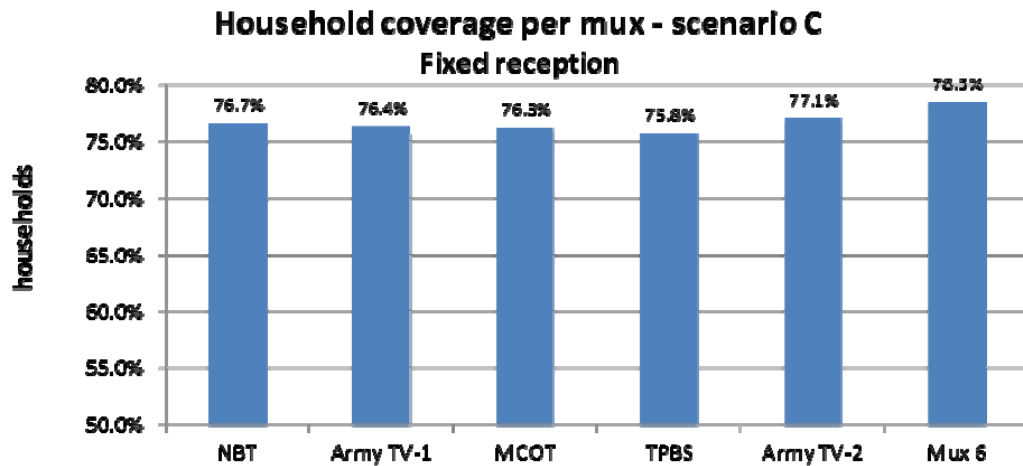
6 Frequency planning of Main sites (1/3)



- High complexity due to:
 - 4 DTTB network operators with different deployment ideas
 - Protecting ATV services, operated by different operators
 - Main sites were given and first 20 sites selected
- Rooftop (FX) and portable indoor (PI) reception requirements
 - PI not clearly defined

2. ITU/NBTC joint DTTB implementation

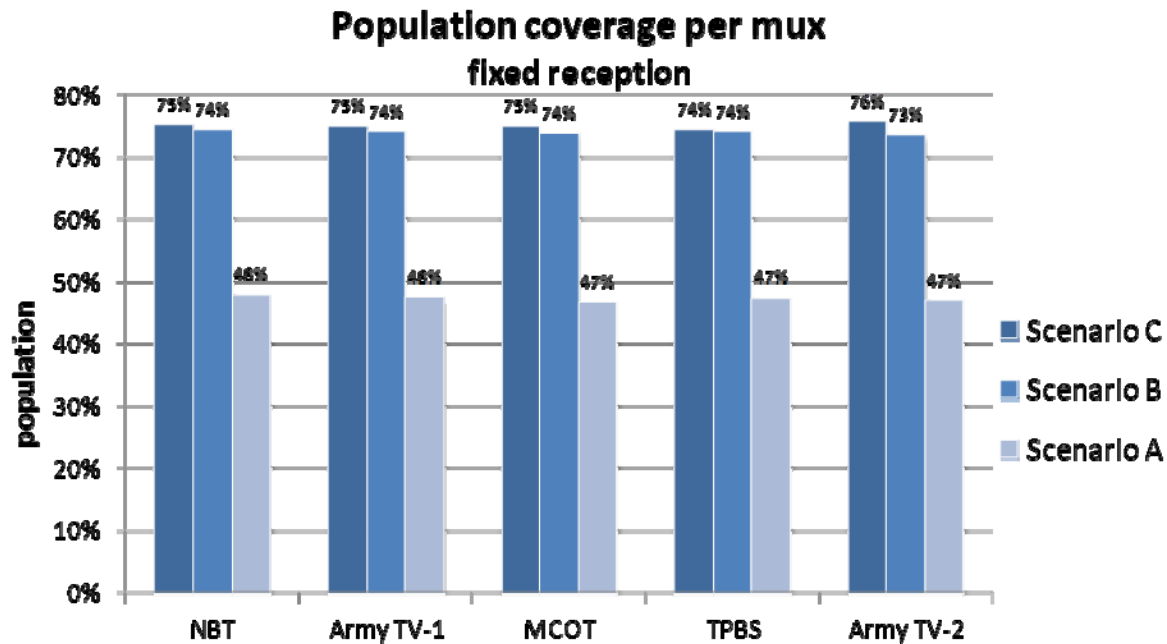
6 Frequency planning of Main sites (2/3)



- Differences are due to propagation differences between lower and higher channels
- Check on spectrum efficient planning:
 - Interference limited coverage 1% below noise limited coverage

2. ITU/NBTC joint DTTB implementation

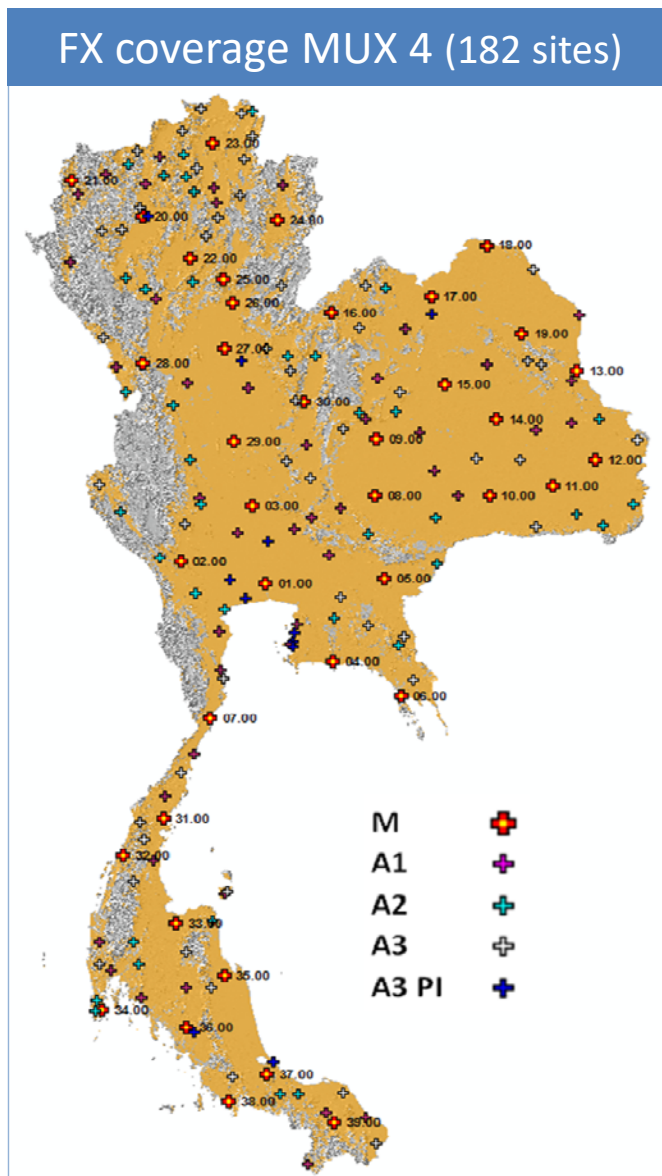
6 Frequency planning of Main sites (3/3)



- Check on efficient planning:
 - Difference between before and after ASO (scenario C and B)

2. ITU/NBTC joint DTTB implementation

7 Additional sites



Type of sites	Number of sites	Household coverage	Difference per type of site
M	39	84.2%	84.2%
M+A1	84	90.4%	6.2%
M+A1+A2	122	92.8%	2.4%
M+A1+A2+A3	171	95.0%	2.2%
M+A1+A2+A3+A3 PI	182	95.0%	0.0%

Multi plex	Operator	Household coverage by the 171 sites from DTTB Plan 3.2, needed to reach the FX coverage target	Household coverage by 182 sites (including the 11 sites to reach the PI coverage target in major municipalities)
1	NBT	43.3%	44.8%
2	Army TV-1	42.5%	44.0%
3	MCOT	42.4%	43.8%
4	TPBS	41.9%	43.4%
5	Army TV-2	43.2%	44.6%
6	Community TV	44.4%	45.7%



3. *Key lessons learned*

3. *Key lessons learned (Thailand)*

1. DTTB deployment and ASO is highly complex and needs a structured approach (based on Guidelines)
2. Auction of DTTB licenses possible but 'winners curse' likely for some
3. Multiple DTTB network operators complicate planning effort and network deployment
4. Cooperation between Regulator and industry essential
5. DTTB planning and implementation last long and regulations may need to be reviewed