



Digital Radio in Thailand

DR market dynamics and overview of ITU work

12 December 2017

Peter Walop

Agenda

Topics

1. Radio market dynamics
2. ITU/NBTC joint DR projects
3. Key lessons learned




1. *Radio market dynamics*

- Radio is not TV
- Digital Radio is efficient
- FM and DR markets are correlated
- Digital Radio is not only IP

1. Radio market dynamics

Radio is not TV

Digital radio
business case
more
challenging

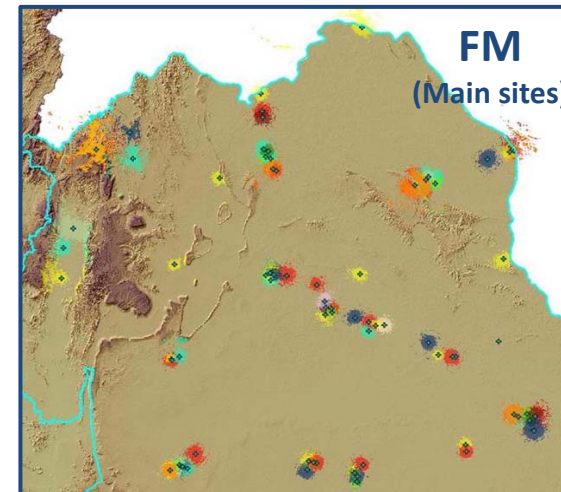
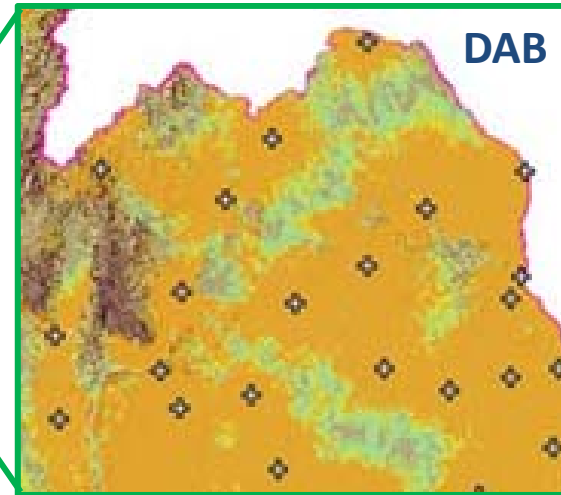
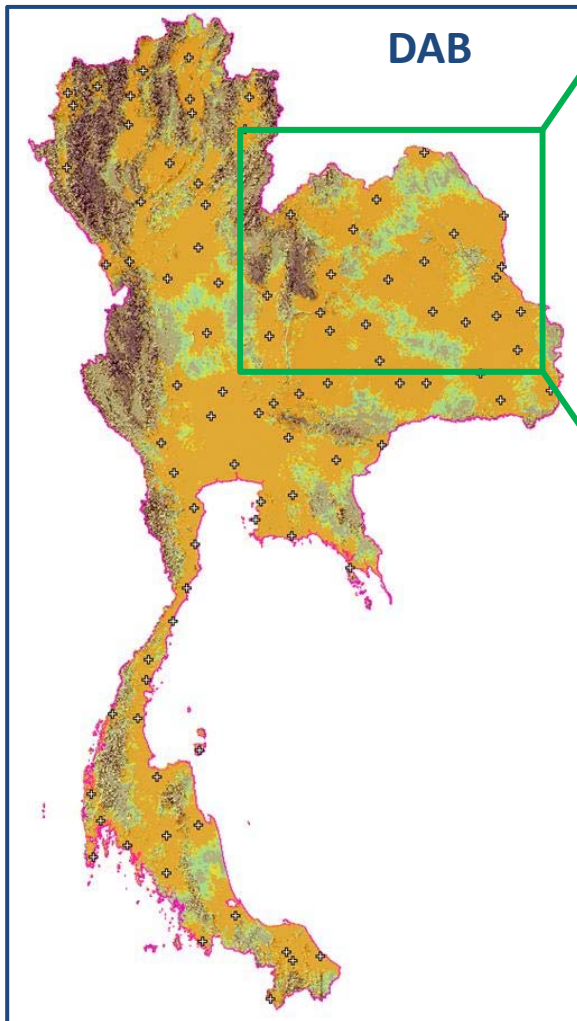
- Installed base of analogue receivers much larger than for TV
 - Analogue receivers have to be replaced
 - Radio market is FTA → no receiver subsidies
 - ARPU is much lower than for TV
 - No 'Digital Dividend' for Radio ASO
- 
- Business case much harder to make viable
 - Simulcast period long
 - Digital receiver retail prices are critical



1. Radio market dynamics

Digital Radio is efficient (1/2)

Nation-wide DAB only after TV ASO (in VHF band)



	DAB	FM (Main sites)
# Sites	90	313
Av. ERP per site	10.1 kW	21.6 kW (BKK) 4.5 kW (Rest)
Coverage (PI) per service	80%	Max 4.5% per site (BKK)

1. Radio market dynamics

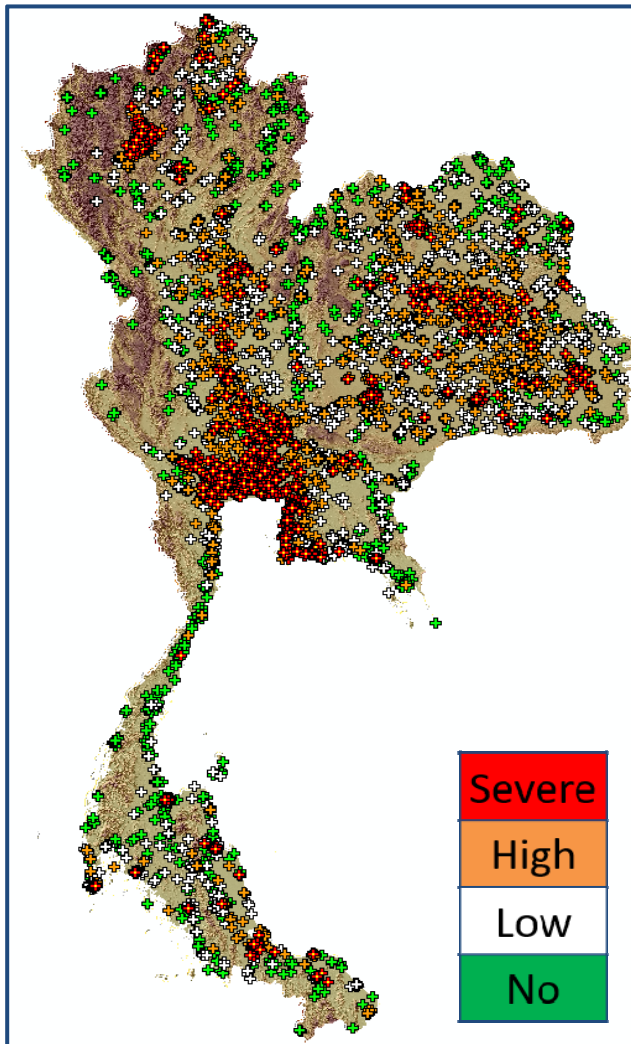
Digital Radio is efficient (2/2)



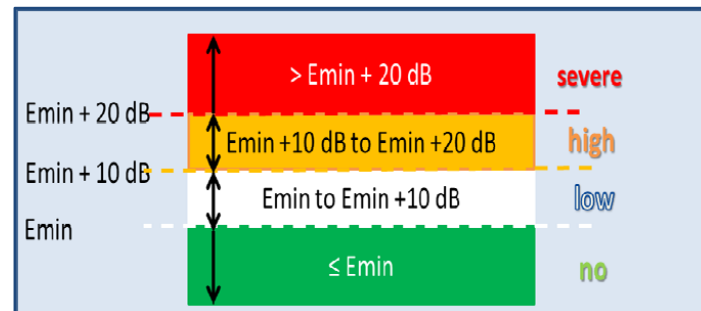
1. Radio market dynamics

FM and DR markets are correlated (1/3)

Thai FM
Band
(87.0 to 108.0
MHz)
Congested



- Congestion is Severe or High mainly in central, north and east
- Due to the high number of local FM stations (~ 5,500)
- Without local FM, the 313 main FM stations are interference free



1. Radio market dynamics

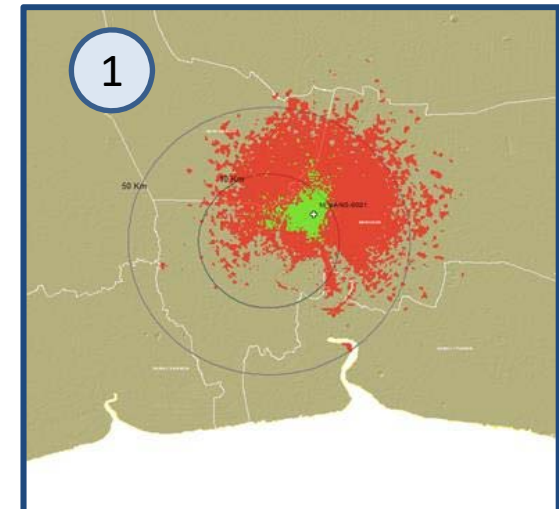
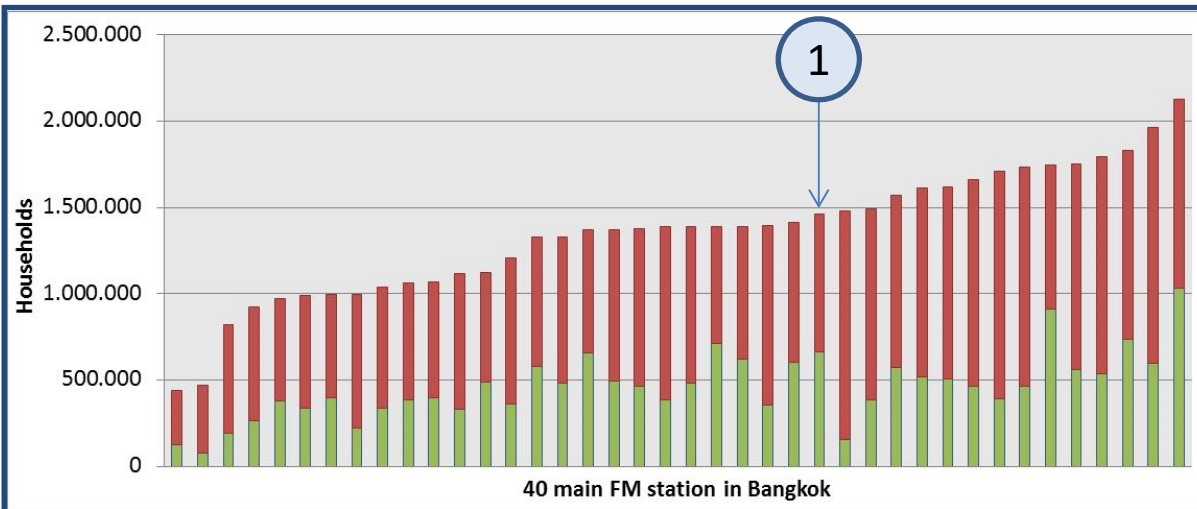
FM and DR markets are correlated (2/3)

Thai radio industry under pressure

- Radio revenues stable (at best) and competition increasing:
 - Already an extreme high number of FM broadcasters (> 5,500)
 - Radio streaming services from (foreign) OTT providers
- Broadcasters turning to IP streaming as an alternative to FM:
 - To get a better reach due to poor FM coverage
 - To increase the number of services
 - To reach larger audiences without regulatory costs

Interference free PI reception Interfered Households

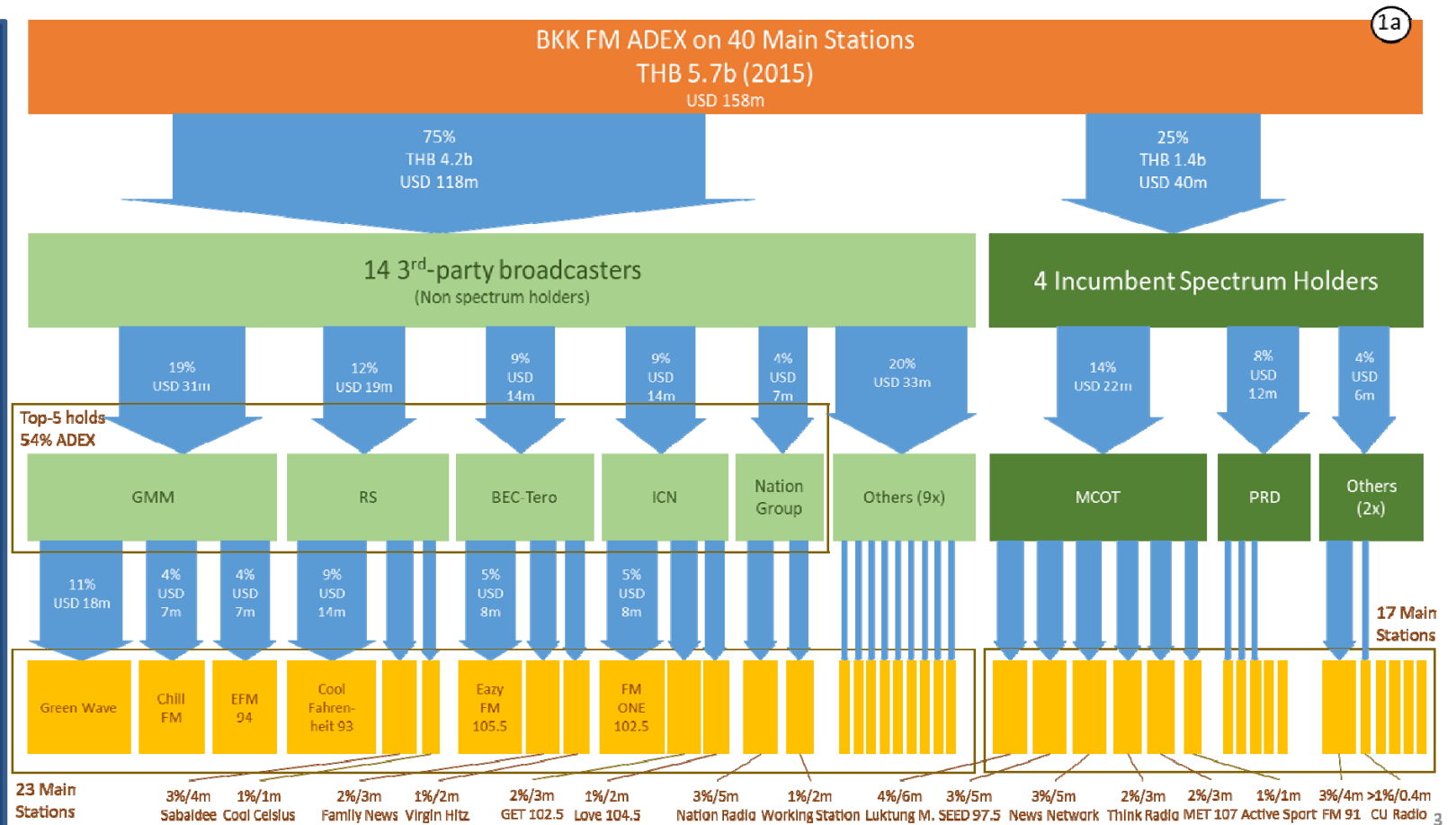
Portable Indoor (PI) Coverage



1. Radio market dynamics

FM and DR markets are correlated (3/3)

Improved FM revenues needed to invest in Digital Future

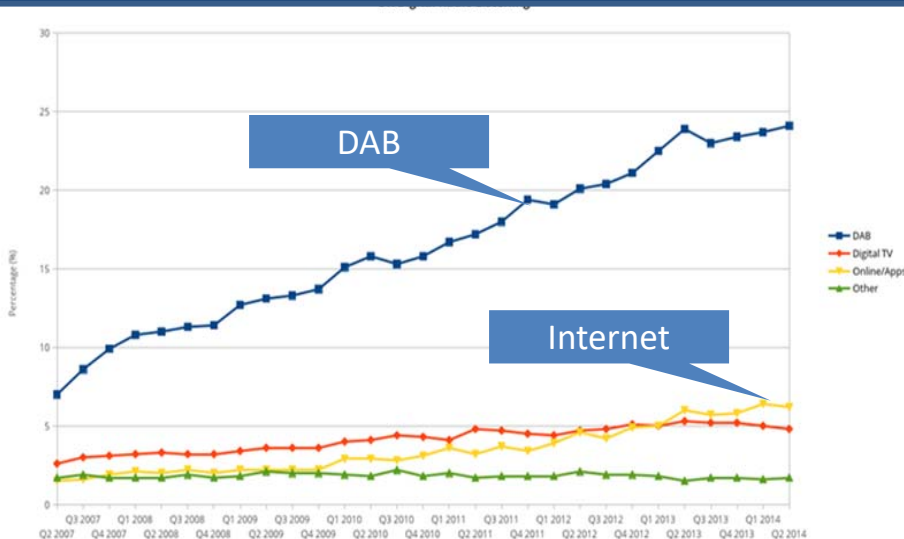


1. Radio market dynamics

Digital Radio is not only IP (1/2)

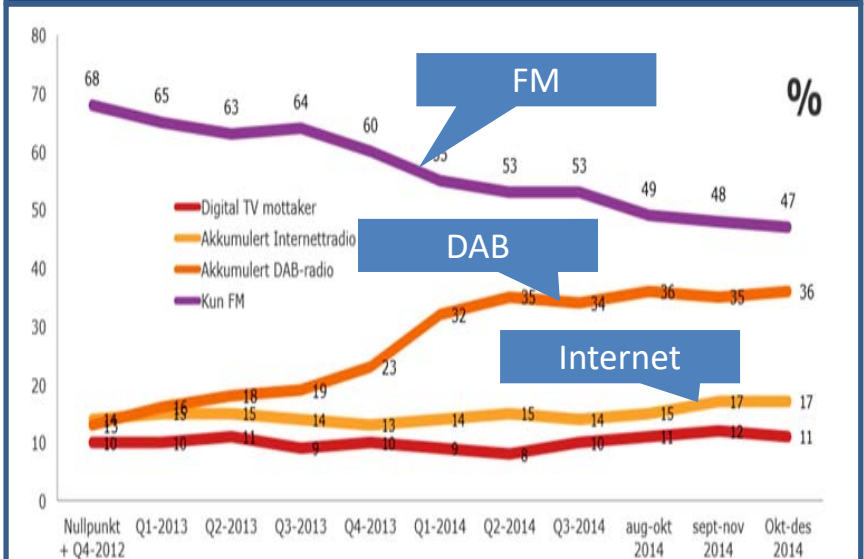
- Internet's listening share is limited compared to (digital) broadcasting platforms, even in Broadband countries
- Building-up an digital listeners base, can not be done without a broadcasting platform (FM, DAB or both)

Digital Listening Shares – UK ⁽¹⁾



(1) ITU ICT Development Index (2016) global ranking: 5

All Listening Shares - Norway ⁽²⁾



(2) ITU ICT Development Index (2016) global ranking: 9

1. Radio market dynamics

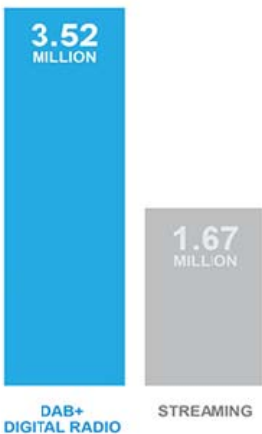
Digital Radio is not only IP (2/2)

Digital Listening Shares – Australia

Australia

1.85m more people listen to dab+ digital radio than listen via streaming and they listen for more than 4hrs longer

PEOPLE LISTENING
PER WEEK



TIME LISTENING
PER WEEK



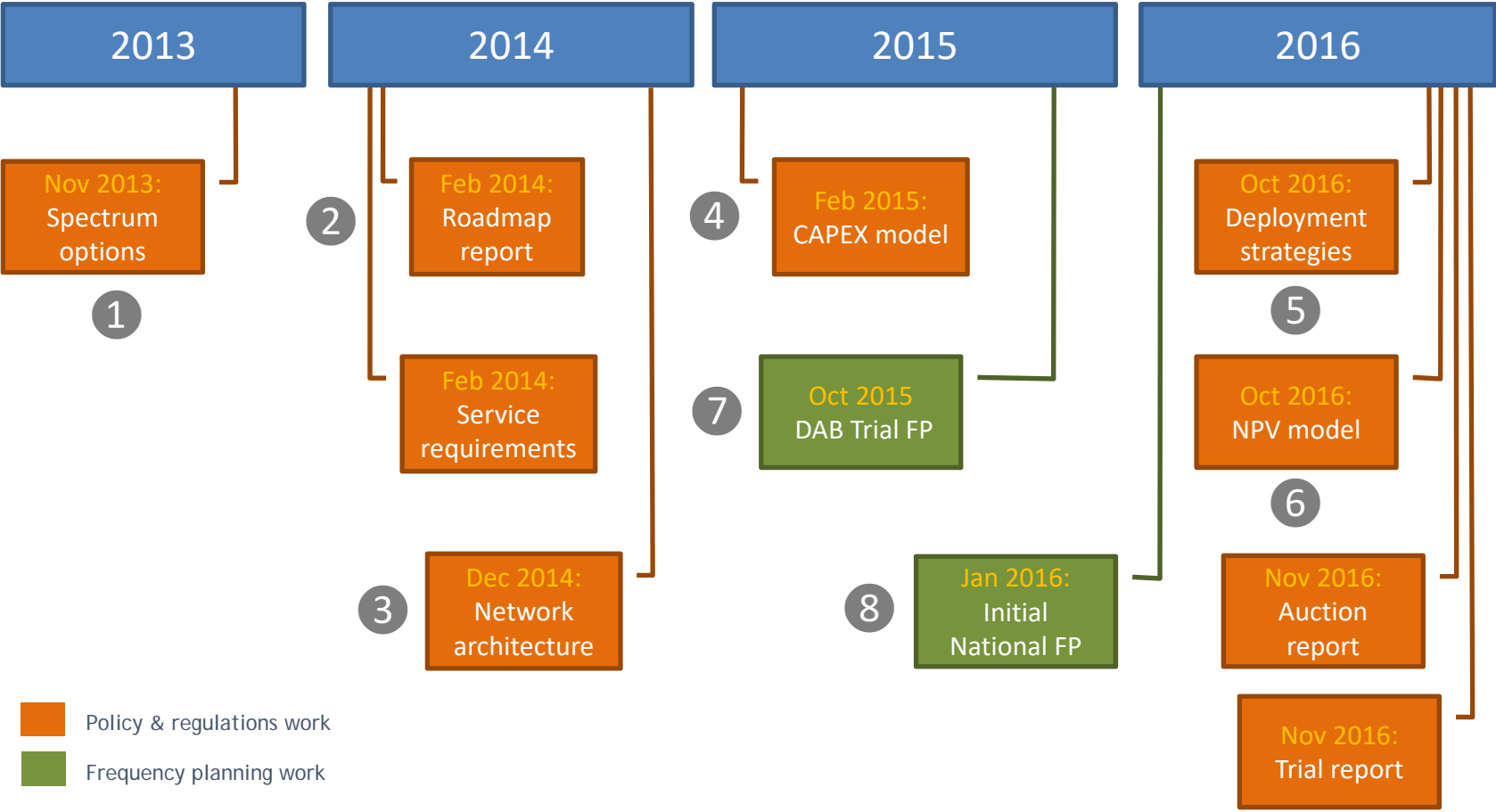


2. *ITU/NBTC joint DR projects*

- Overview of key deliverables
- Key deliverables

2. ITU/NBTC joint DR implementation

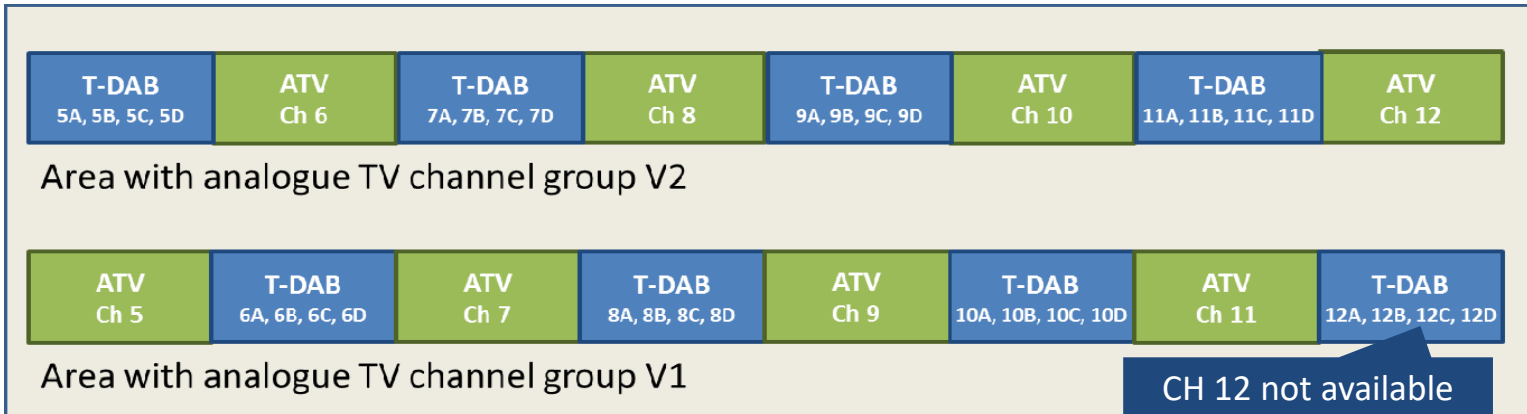
Overview of key deliverables



2. ITU/NBTC joint DR projects

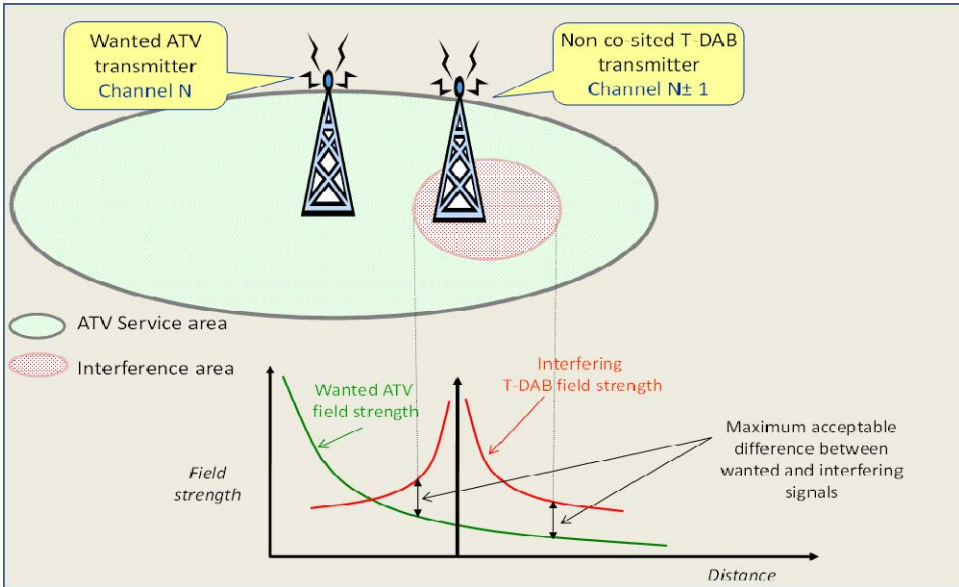
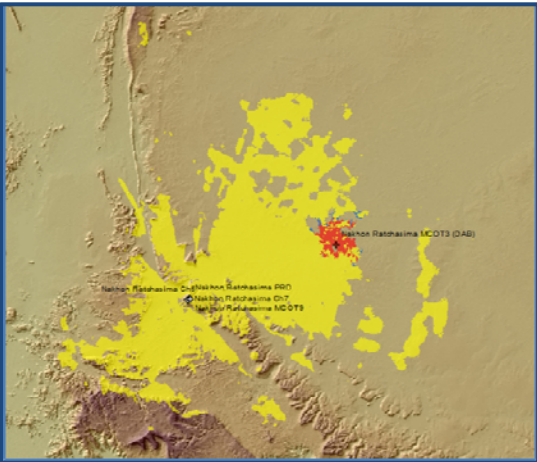
1 Spectrum options

DAB Trial to protect ATV



CH 12 not available for DAB in Thailand

Adjacent channel interference to be avoided



2. ITU/NBTC joint DR projects

2 DR Roadmap report

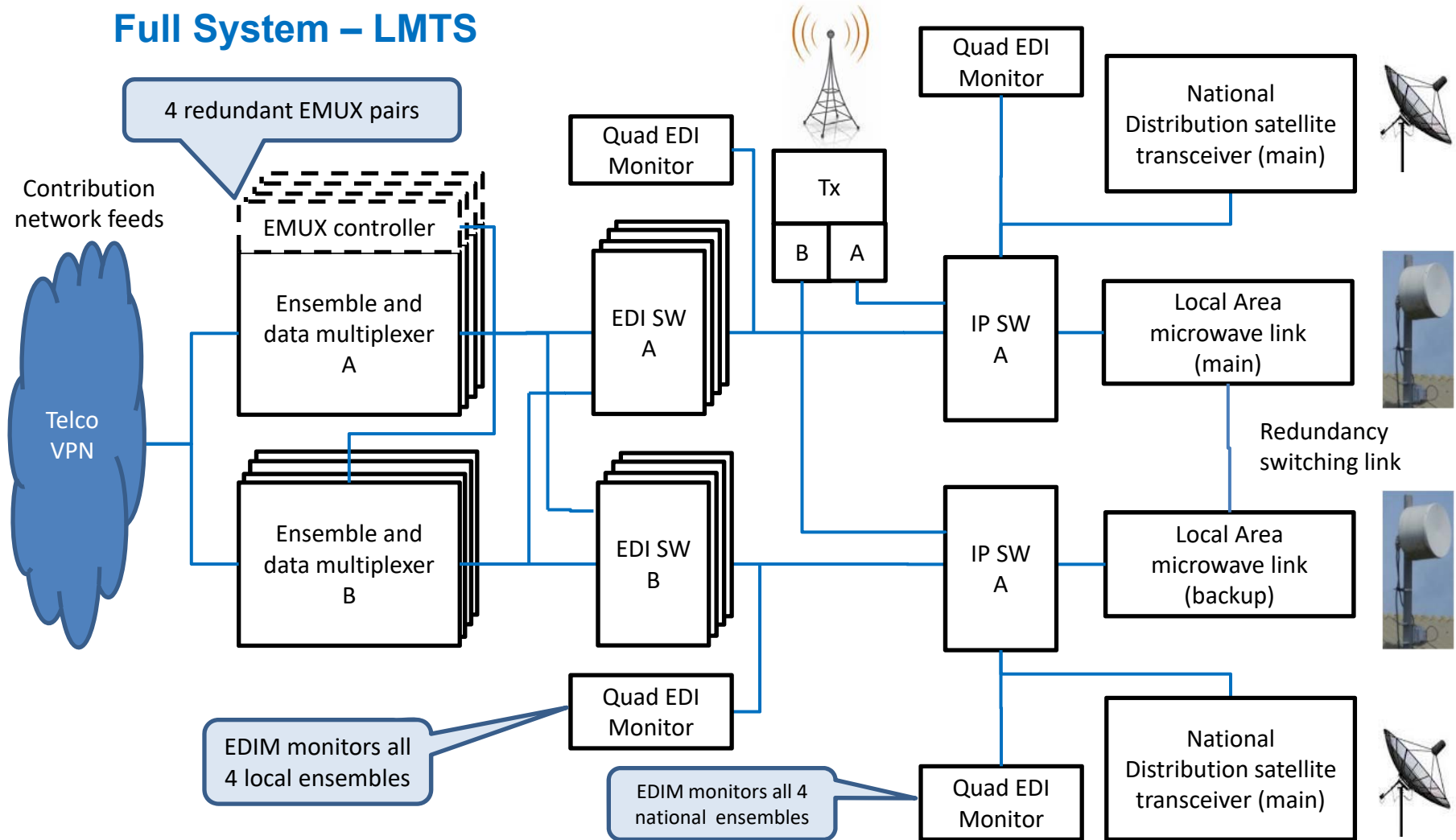
Two frequency planning scenarios & targets

	Trail Frequency Plan	Plan A	Plan B	Initial National Frequency Plan
Item	Scenario 1	Scenario 2		
Description	All VHF Band III on air (and protected)	All digital situation – ASO VHF Band III		
Pop coverage target	10 +1 city	95%, including 11 cities		
# national MUX	Up to 3	Up to 4		
# national audio services	3x(18 or 9)=54 to 27 ⁽¹⁾	4x(18 or 9)=72 to 36		
# local MUX	None	4		
# local services	None	72 to 36 in 39 local areas		

(1) Multiplex total bit rate = 1152 kbps, bit rate per Service license between 64 and 128 kbps

2. ITU/NBTC joint DR projects

3 Network architecture – detailed design (2/2)



2. ITU/NBTC joint DR projects

4 CAPEX model (1/2)

National & Local Studios

Total		CAPEX National studios														
\$1,402,000		Encoders			SP controller		PAD server		IP Router/Switch (VPN)		Installation & Comm. Encoders/PAD		Installation & Comm. VPN		Training Encoders/PAD	
		redundant							redundant				redundant			
# SP	Service Provider	# services/SP	# mux	services /mux	pcs	Price / encoder instance	pcs	Price / SP	pcs	Price / instance	pcs	Price / IP RS	pcs	Price / SP	pcs	Price / SP
4	National (large)	4	4	18	32	\$192,000	4	\$0	4	\$32,000	8	\$24,000	4	\$12,800	8	\$7,200
28	National (small)	2			112	\$672,000	28	\$0	28	\$154,000	56	\$168,000	28	\$89,600	56	\$50,400
32					144	\$864,000	32	\$0	32	\$186,000	64	\$192,000	32	\$102,400	64	\$57,600

National & Local Head-ends

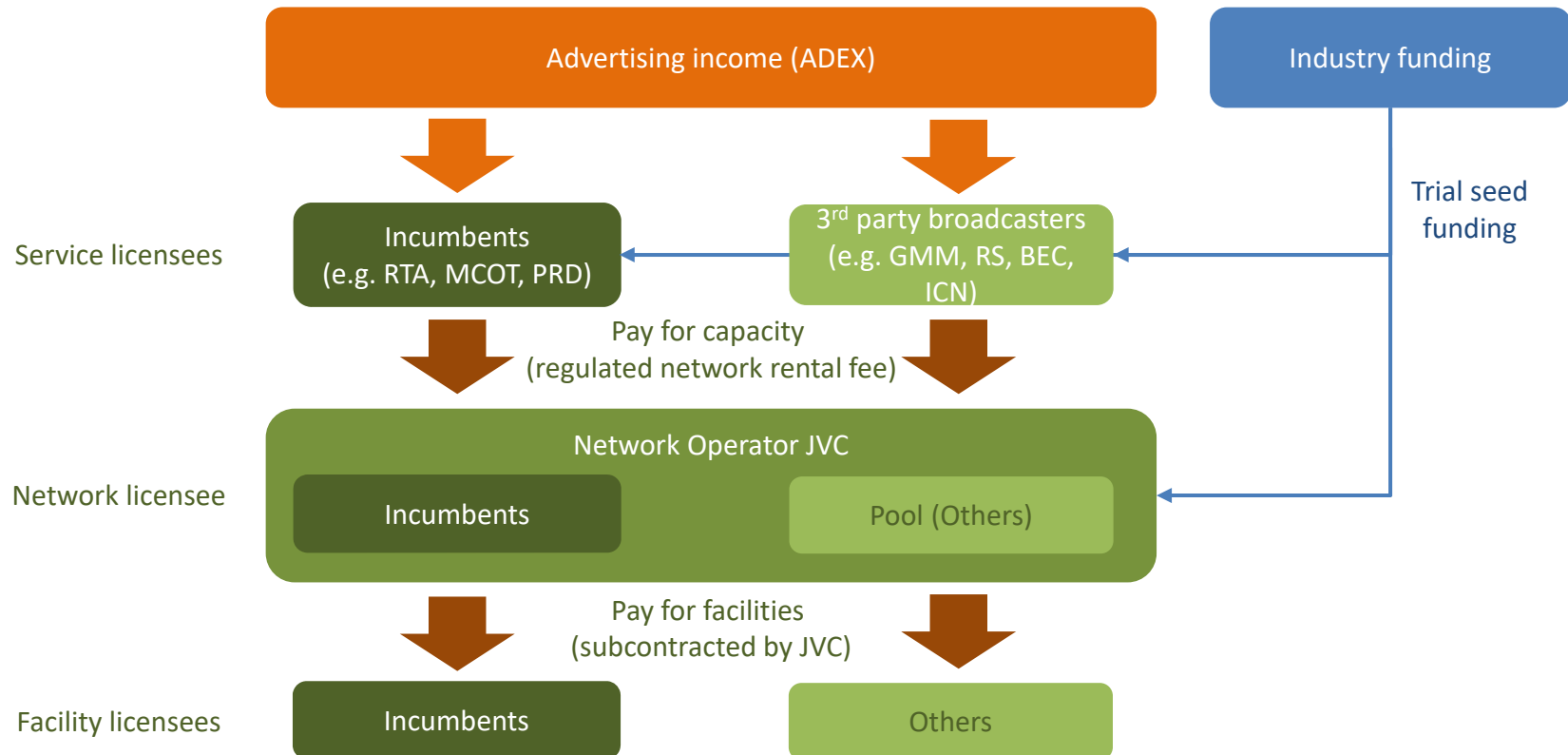
Total head-end		National distribution		CAPEX Local head-ends													
\$18,024,800		\$2,743,600		IP Router/Switch (VPN)		Ensemble/data MUX		E MUX controller		National service (+ NMS traffic) satellite TX/R		National service (+ NMS traffic) satellite Dish		EDI Monitor		EDI Switch	
#	head-end	NMS (per monitored site + installation) - redundant		MSTS & Set of Racks & mounting parts		GPS/NTP server		Installation & Commissioning VPN		Installation & Commissioning MUX/controller		Installation & Commissioning Satellite		No-break power supply (UPS) - 6 kVA		Training MUX & NMS	
38	Local							redundant						redundant			
0																	
pcs	Price / site + \$20k	pcs	Price / head-end	pcs	Price / NTP / head-end	pcs	Price / Head-end	pcs	Price / Head-end	pcs	Price / Head-end	pcs	Price / Head-end	pcs	Price / Head-end	pcs	Price / NO
502	\$522,000	38	\$114,000	76	\$608,000	76	\$273,600	38	\$646,000	38	\$190,000	76	\$456,000	38	\$190,000	76	\$456,000
	\$522,000	38	\$114,000	76	\$608,000	76	\$273,600	38	\$646,000	38	\$190,000	76	\$456,000	38	\$190,000	76	\$456,000

Distribution

Total		Distribution National & Local													
\$60,705,400		MW pair		IP Router/Switch (VPN)		racks for VPN & MW		UPS - 6 kVA (incl. Installation)		Power Generator - 50 kVA		Installation & Commissioning MW		Installation & Commissioning VPN	
		redundant		redundant											
Total # sites	# of non main sites	pcs	Price / pair	pcs	Price / RS	pcs	Price / Head-end	# Greenfields	SS tower & facilities (60m)	SS tower & facilities (120m)	Guy tower & facilities (120m) - ground space 5 rai	pcs	Price / tower	pcs	Price / tower
502	463	926	\$18,520,000	926	\$2,778,000	463	\$463,000								
		926	\$18,520,000	926	\$2,778,000	463	\$463,000								
		Totals	926	\$18,520,000	926	\$2,778,000	463	\$463,000							
								201	\$0		€ 0	201	€ 8,040,000		
								201	\$0		\$0	201	\$8,040,000		

2. ITU/NBTC joint DR projects

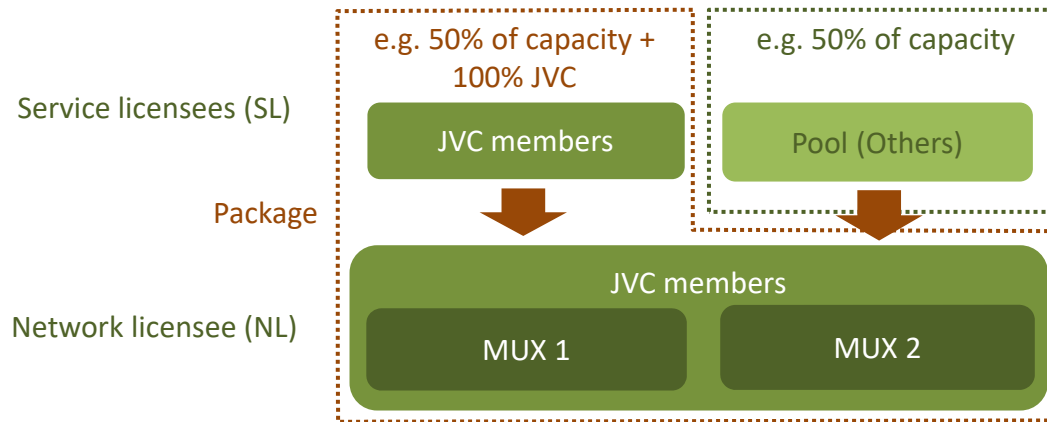
5 Deployment strategy (1/2)



2. ITU/NBTC joint DR projects

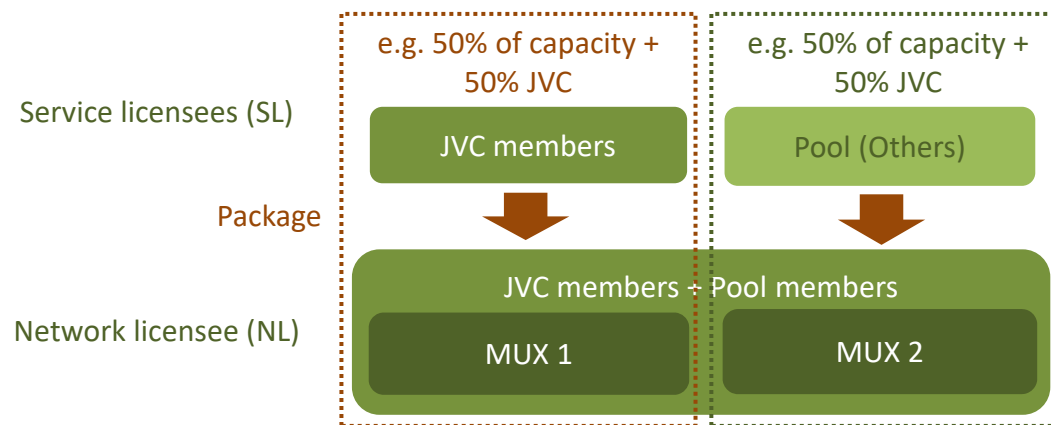
5 Deployment strategy (2/2)

Option 1: JVC members get “Package” by Invitation + JVC closed



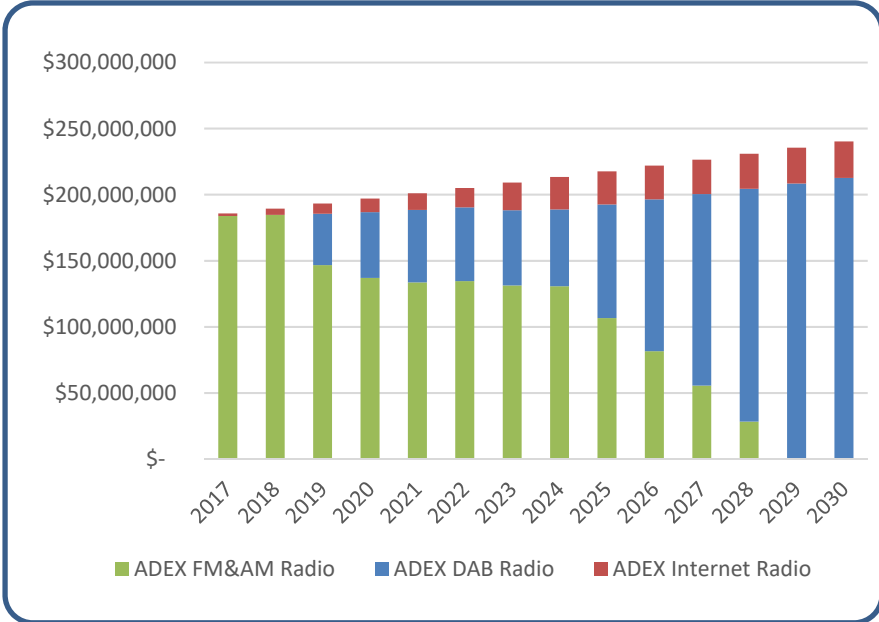
Option 3: as option 1 or 2 but “Package” assigned by Public Tender

Option 2: JVC members get “Package” by Invitation + later JVC open to Pool



2. ITU/NBTC joint DR projects

6 NPV model



DAB Revenues/ADEX

Ref.	# sites	Pop %	# MUX	# SPs	Total CAPEX	NPV total market	NPV / Nat. SP	NPV / Local SP
N1	200	95%	2+0	18+0	\$84,702,880	\$190,502,461	\$10,583,470	NA
N2	90	80%	2+0	18+0	\$37,973,880	\$266,538,766	\$14,807,709	NA
N3	200	95%	3+0	27+0	\$131,831,770	\$67,201,171	\$2,488,932	NA
N4	90	80%	3+0	27+0	\$59,252,770	\$204,157,121	\$7,561,375	NA
NL1	200	95%	2+1	18+351	\$146,869,070	-\$434,513,538	\$6,710,995	-\$1,149,838
NL2	90	80%	2+1	18+351	\$74,290,070	-\$297,557,588	\$11,411,848	-\$1,000,720

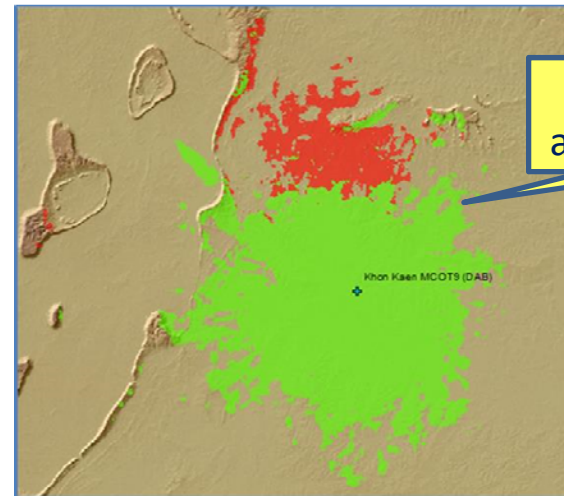
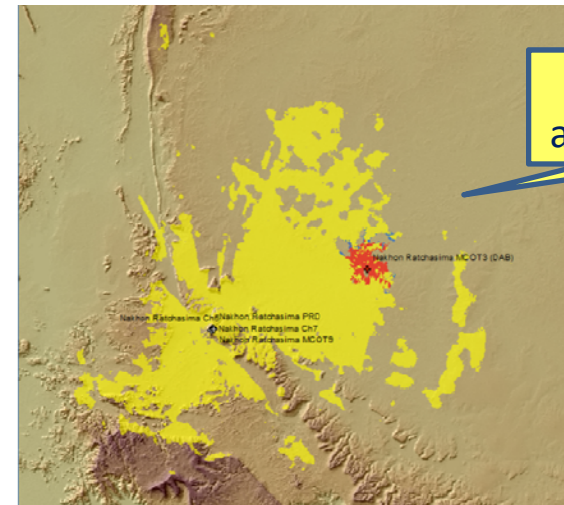
NPV scenarios

2. ITU/NBTC joint DR projects

7 Trial DAB FP

ITU - ATV protected

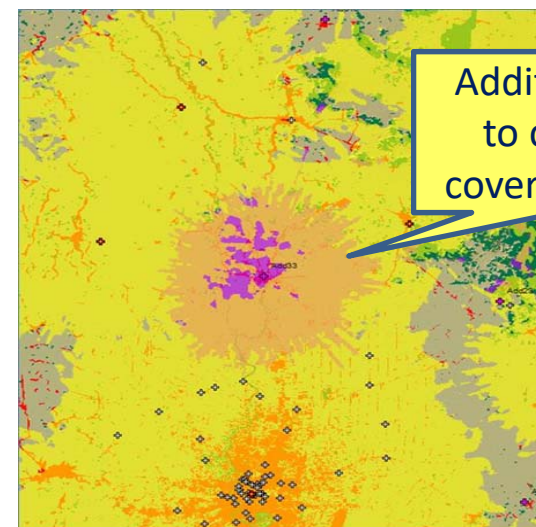
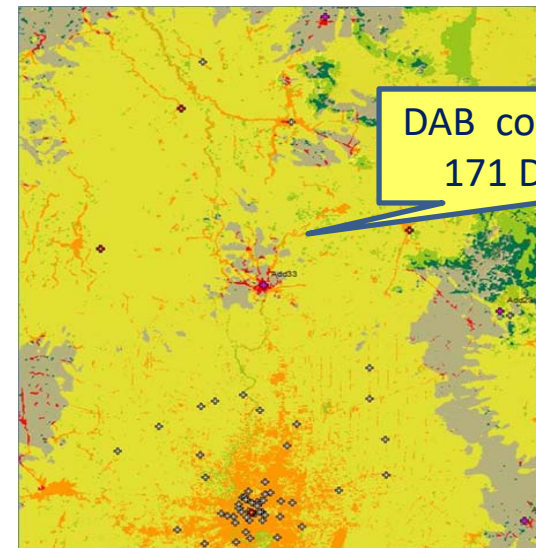
DAB site	DAB block	ERP	Network mode
Bangkok-CH5	6B	1.0 kW	MFN
	6C	5.0 kW	MFN
	10C	2.0 kW	SFN with Chonburi 10C
Chiang Mai-CH7	6C	10.0 kW	MFN
	8C	10.0 kW	MFN
	10C	10.0 kW	MFN
Chonburi-MCOT	10B	0.4 kW	MFN
	10C	2.0 kW	SFN with Bangkok 10C; delay 20µs
	10D	0.5 kW	MFN
Hua Hin-CH7	6D	10.0 kW	MFN
	8B	2.0 kW	MFN
	8C	10.0 kW	MFN
Khon Kaen-MCOT9	6B	2.0 kW	MFN
	6C	10.0 kW	MFN
	10C	10.0 kW	MFN
Nakhon Ratchasima-MCOT3	9C	0.5 kW	MFN
	11C	1.0 kW	MFN
	11D	0.25 kW	MFN
Nakhon Sri Thamarat-PRD	6C	0.2 kW	MFN
	8C	0.2 kW	MFN
	10C	0.2 kW	MFN
Song Khla-Ch 5	7C	-	
	9C	0.2 kW	MFN
	9D	0.1 kW	MFN



2. ITU/NBTC joint DR projects

8 Initial National DAB FP

#	Number of sites	Example network topology	ERP	Mean ERP per site	Household coverage	Remaining HH to reach 95%	Household coverage %
1	171	DTTB topology	All sites 10 kW, except Bangkok 20 kW	10.06 kW	21,291,221	403,757	93.2%
2	200	DTTB topology plus 29 additional sites	All sites 10 kW, except Bangkok 20 kW	10.05 kW	21,863,987	-169,009	95.7%
3	225	DTTB topology plus 54 additional sites	All sites 10 kW, except Bangkok 20 kW	10.04 kW	21,978,392	-283,414	96.2%





3. *Key lessons learned*

3. *Key lessons learned (Thailand)*

1. DR business case is harder to make viable and a long-term strategy is needed
2. FM broadcasters have started to go digital with IP streaming and DR is lagging behind
3. FM congestion needs to be resolved to improve broadcasters' earnings so that they can invest in their digital future
4. Industry collaboration is critical in keeping costs down and marketing DR effectively
5. DR planning and implementation last long and regulations may need to be reviewed