Analogue Switch-off in Japan

December, 2010

Takashi YABASHI

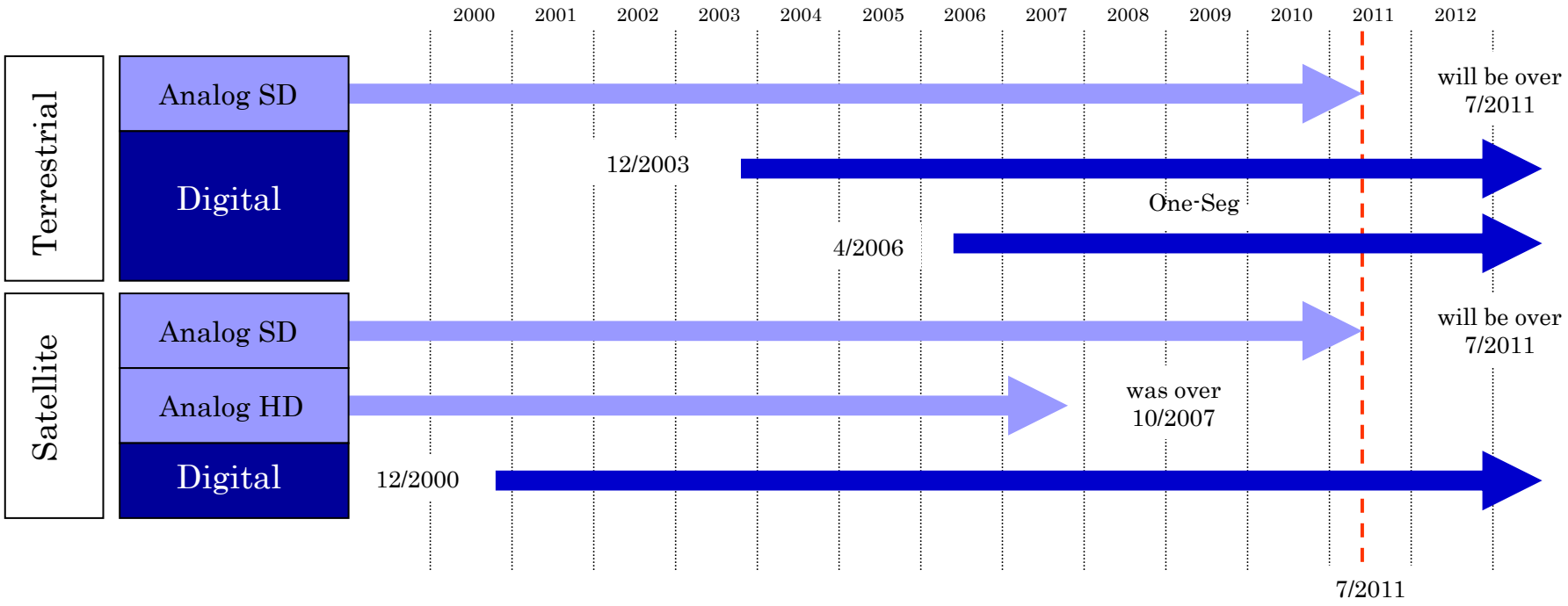
NHK

Milestones in Progress Towards Migration to Digital Terrestrial Broadcasting

July 2001	Through amendment to the Radio Law, the date of the termination of analog and full transition to digital broadcasting was determined to be July 24, 2011
December 1, 2003	Digital terrestrial broadcasting was launched in the three largest metropolitan areas
April 1, 2006	One-segment broadcasting service began
December 1, 2006	Digital terrestrial broadcasting expanded to nationwide
July 24, 2011	Complete termination of analog broadcasting

Analogue Switch-off in JAPAN

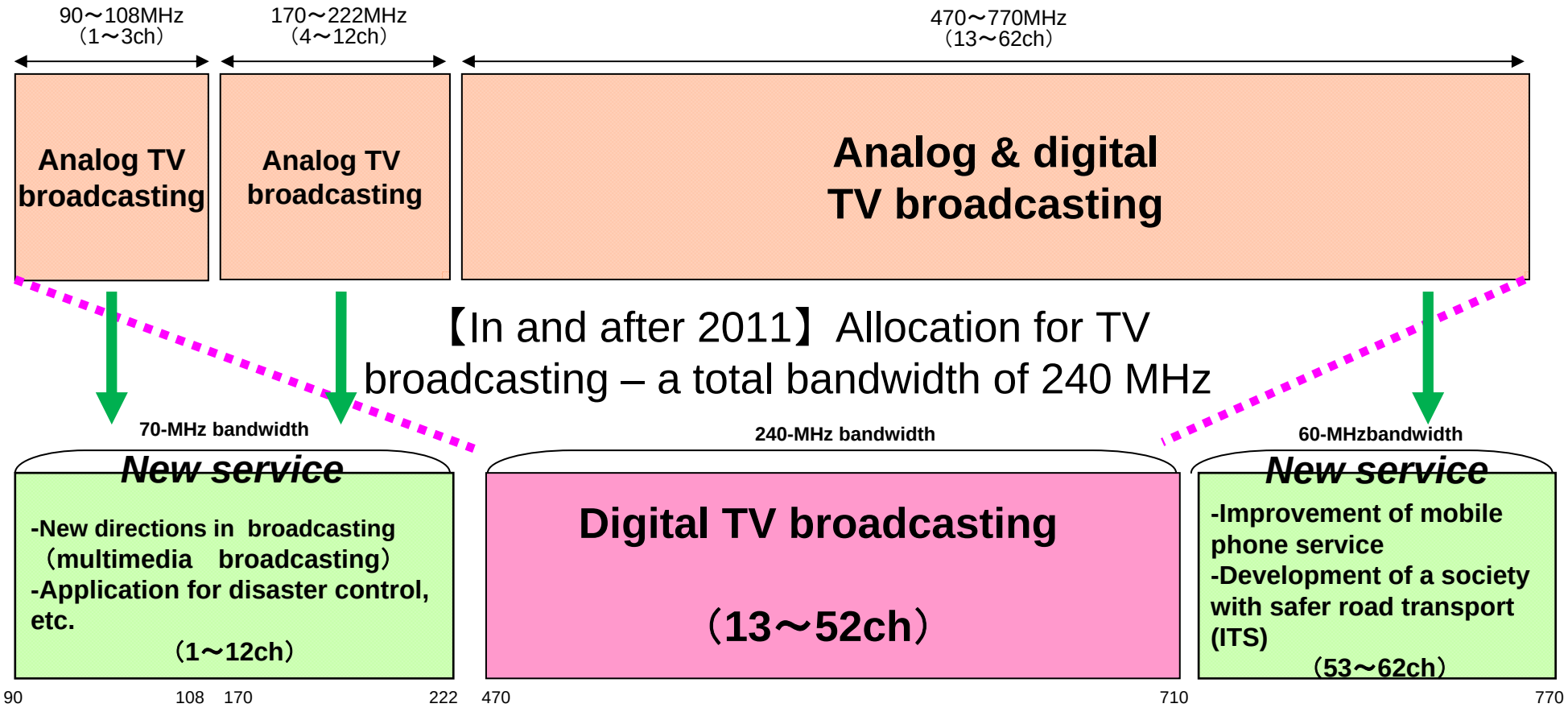
- All Analog TV broadcasts will be terminated by 24 July 2011.
- DTT Coverage by radio wave and community receptions became 99.0% of households as of November 2010.
- After July 2011, the digital channels between 53ch and 62ch have to move low channels about between 13ch and 52ch.



Timeline of Digital Broadcasting Services

Effective use of radio waves

【Current state of frequency utilization】 Allocation for TV broadcasting - a total bandwidth of 370 MHz

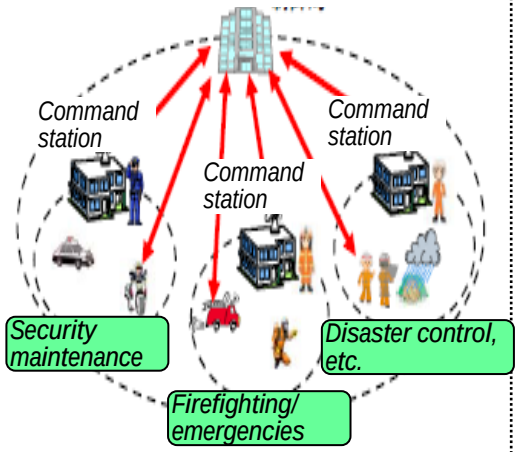


New Service to be Realized by Utilizing Released Frequencies

New Service is realized by Utilizing Released Frequencies

Applications for disaster control

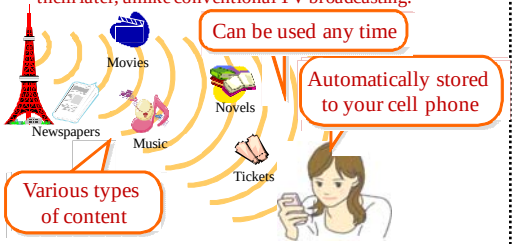
Control station



Video and data information on status of emergency are helpful.

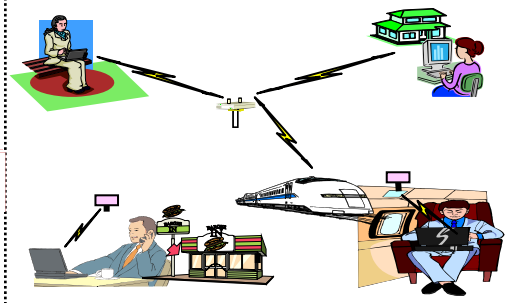
Multimedia broadcasting

■ File casting service:
Viewers can store the video files and watch them later, unlike conventional TV broadcasting.



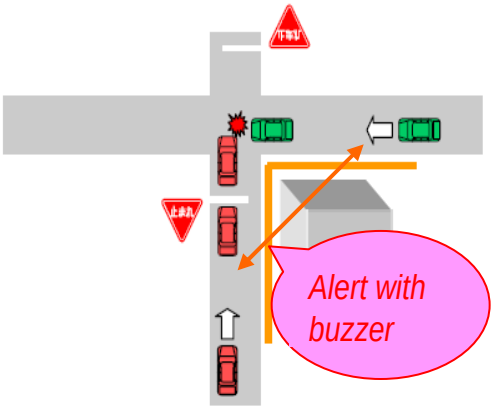
■ High-quality streaming service:
Viewers can watch the video as they receiving it, just like conventional TV broadcasting.

Growing number of mobile phones



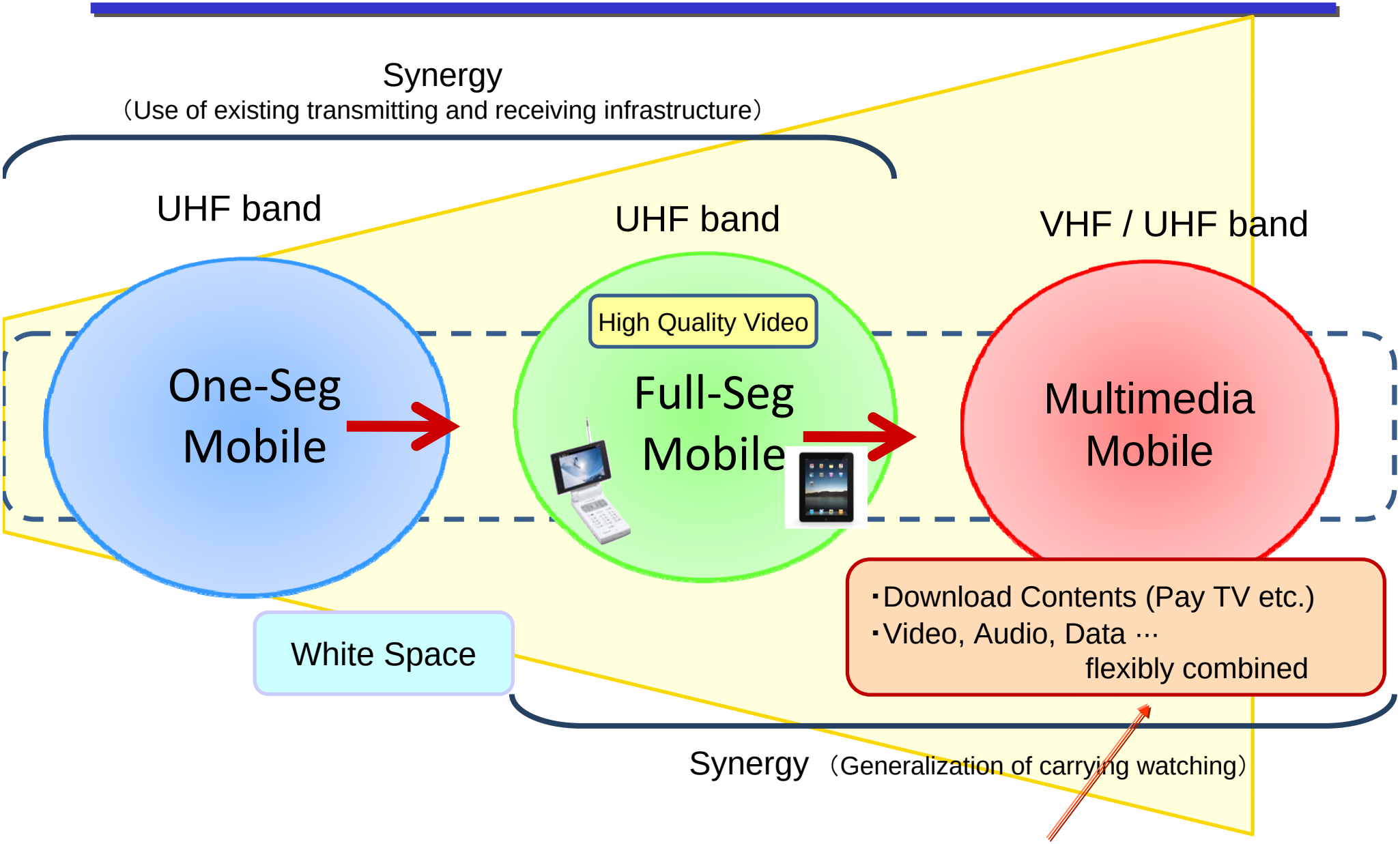
Respond to frequency needs for the growing number of mobile phones.

Intelligent Transport (ITS)



Make more safety and more convenient in your lifestyle !

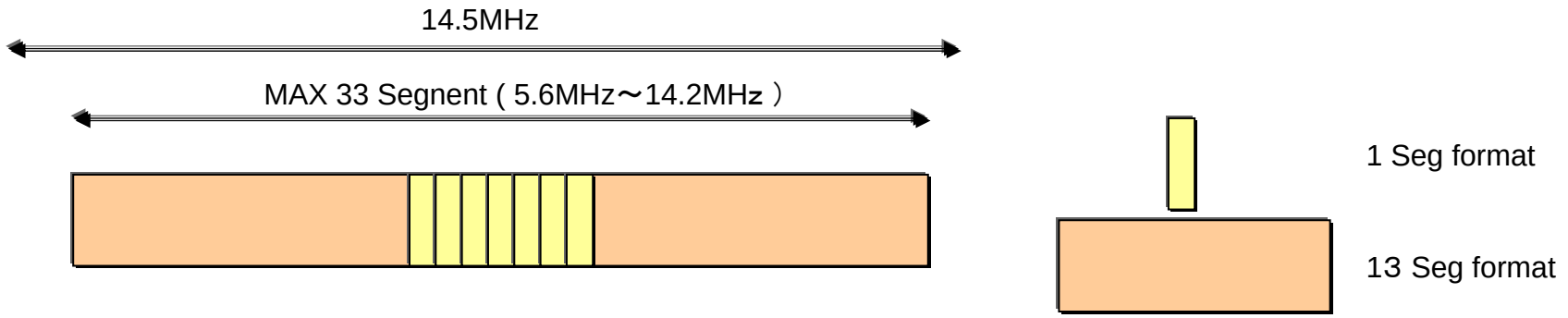
Synergy Effect of Future Mobile TV



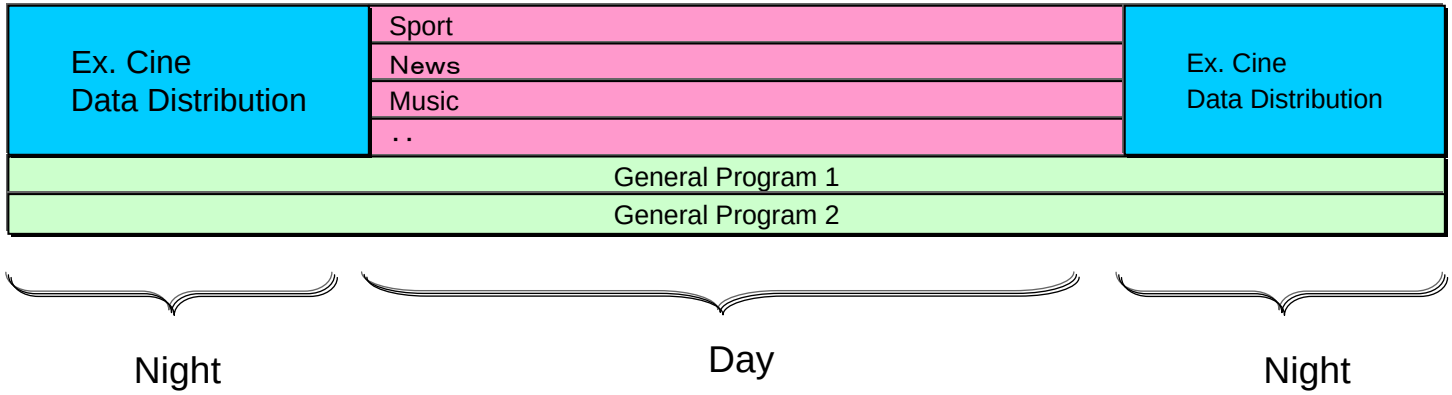
Expansion from broadcasting business to Mobile business

Multimedia Broadcasting

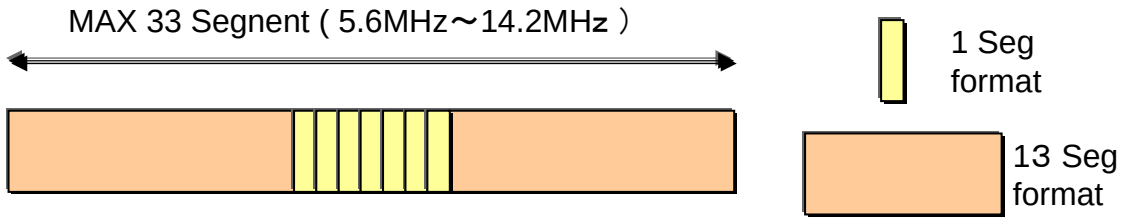
Segments Configuration Example



Broadcasting Service Image



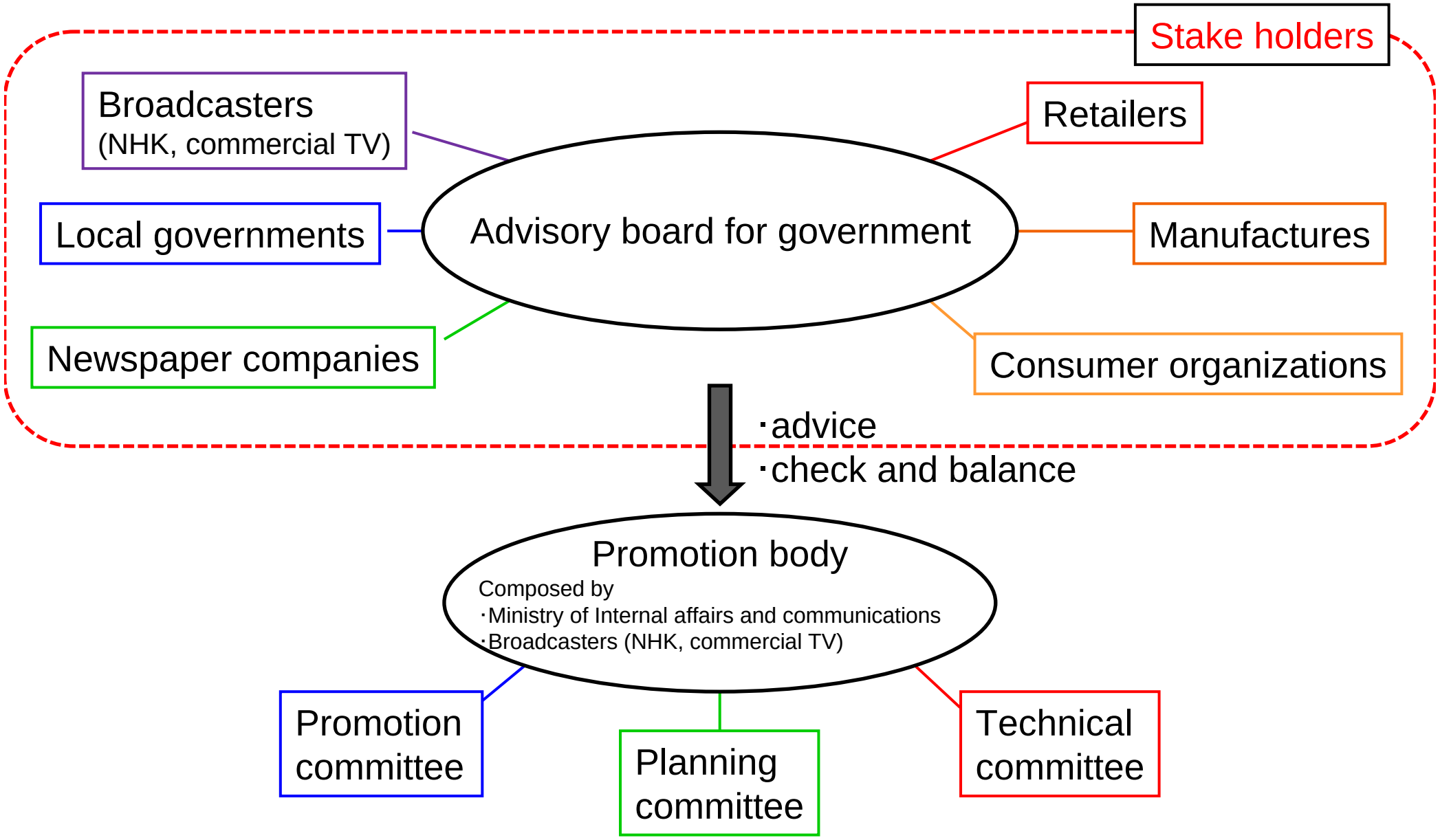
Technical Parameters of ISDB-Tmm

Frequency band		VHF, UHF
Modulation		DQPSK, QPSK, 16QAM, 64QAM
Guard interval		1/4, 1/8, 1/16, 1/32
Band width		About 5.6MHz ～ about 14.2MHz
Error Correction	Inner code	Convolutional code (1/2, 2/3, 3/4, 5/6, 7/8)
	Outer code	RS (204, 188)
Interleaving		Frequency and time interleaving
Video coding		ITU-T Rec. H.264| ISO/IEC 14496-10
Audio coding		AAC+SBR+PS/MPEG Surround
Channel coding Configuration Example		

※1：SBR: Spectral Band Replication

※2：PS: Parametric Stereo

National Organization for migration



Method of Effective Expansion of Transmission (Channel Planning, Road Map)

Key point of frequency selection of transmission

→ No interference
Coverage Area
Effective utilization frequency (SFN)

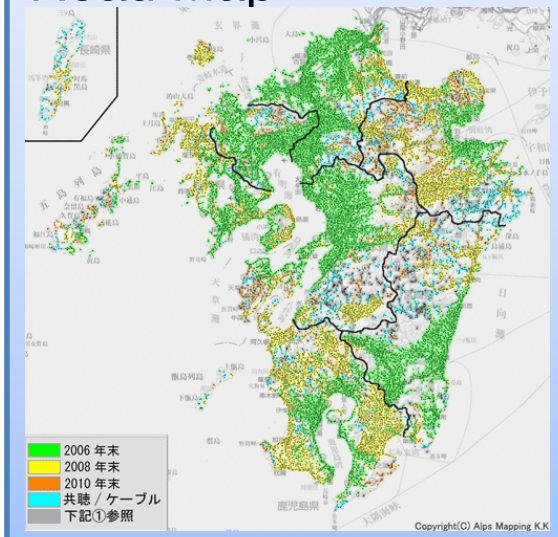
Simulation by special software

-Conditions-
Place, Power, Antenna Pattern, Topography, Frequency, Channel ,etc.

<Channel Planning>

Station	Channel							Power(W)
Tokyo	27	26	25	22	21	24	23	10000
Osaka	24	13	16	15	17	14		3000
Nagoya	20	13	18	21	22	19		3000
Fukuoka	28	22	30	31	34	32	26	3000
Sapporo	15	13	19	21	23	25	14	3000
Sendai	17	13	19	21	24	28		3000
Niigata	15	13	17	19	26	23		3000
Hiroshima	14	15	18	19	22	23		3000
Fukushima	15	14	25	27	29	26		3000
Kofu	21	23	25	27				2000
Okayama	32	45	21	27	18	20	30	2000
Nagano	17	13	16	15	14	18		1000
Kanazawa	15	13	14	16	17	23		1000
Shizuoka	20	13	15	17	18	19		1000
Hamamatsu	20	13	21	22	23	25		1000
Fukui	19	21	20	22				1000
Toyama	27	24	28	18	22			1000
Matsue	21	19	41	45	43			1000
Yamaguchi	16	13	20	18	26			1000
Kumamoto	28	24	41	42	47	49		1000
Kitakyusyu	40	42	30	31	29	32	27	1000
Nagasaki	15	13	14	20	19	18		1000
Sasebo	42	40	22	34	38	16		1000
Kagoshima	34	18	40	42	36	29		1000
Miyazaki	14	13	15	16				1000
Oita	15	14	22	34	32			1000
Okinawa	17	13	14	15	16			1000
Akita	15	13	17	21	29			1000
Yamagata	14	13	16	18	20	22		1000
Morioka	14	13	16	18	20	22		1000
Aomori	16	13	28	30	32			1000
Hakodate	18	14	17	15	23	25	19	1000
Asahikawa	15	13	19	23	14	25	21	1000
Obihiro	15	13	19	21	23	25	17	1000
Kushiro	33	29	45	31	36	43	61	1000
Abashiri	18	13	22	16	20	24	14	1000
Matsuyama	16	13	20	27	21	17		1000
Kochi	15	13	17	19	21			1000
Tokushima	34	40	31					1000

Road Map



Area	Station	Station size	Establishment	Coverage area
Saga	Saga	Master	Dec-06	84%
	Imari	Relay(L)	Dec-06	
	Karatsu	Relay(L)	Apr-07	
	Hinokuma	Relay(L)	Oct-07	
	Hizenarita	Relay(L)	Feb-08	
	Takeo	Relay(L)	Feb-08	
	Yobuko	Relay(L)	Aug-08	
	Ureshino	Relay(s)	Aug-08	
	Taku	Relay(s)	Oct-08	96%
	Kohoku	Relay(s)	Oct-08	
	Ogi	Relay(s)	Jun-09	
	Yamatokawakami	Relay(s)	Mar-09	
	Hizenyamato	Relay(s)	Jun-09	
	Ariakefukaura	Relay(s)	Jul-09	
	Nishiarita	Relay(s)	Sep-09	
	Hizentakagushi	Relay(s)	Nov-09	
	Imarikurokawa	Relay(s)	Dec-09	
	Higashisefurison	Relay(s)	Dec-09	
	Takunoso	Relay(s)	Jun-10	
	Hizen-oura	Relay(s)	Jun-10	
	Kiyamakido	Relay(s)	Sep-10	
	Kiyamamiyawaki	Relay(s)	Sep-10	
	Hizengenkai	Relay(s)	2010	
	Hizenfuji	Relay(s)	2010	
	Karatsuminato	Relay(s)	2010	
	Kiyamasonobe	Relay(s)	2010	
	Shiota	Relay(s)	2010	98%
	Taraoura	Relay(s)	2010	

<Effect>

- Expansion of transmission area in conjunction with publicity activity
- Distribution network of receiver
- Construction equalization
  → priority level
- Calculation of construction cost
  → investment plan

Method of Effective Preparation of Receiving Side

Purpose: DTTB support center established in nationwide by MIC
for publicity and advisement of DTTB
Overview: Variety of support toward migration
The main participating organizations:
Local government, Constructor, Retailer, Broadcasters

(1) Explanation, Provision of information
Explanatory meeting, publicity and publication
(especially Elderly people, Low-income earner)

(2) Survey and measurement of receive condition of radio wave
Survey and Provision of information of receive condition
by radio measurement vehicle

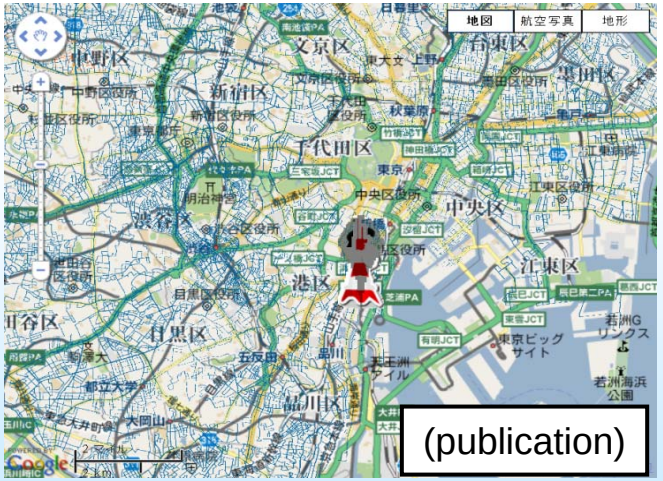
(3) Responding to queries how to receive
Individual reception conference in nationwide (call center)

Method of Effective Preparation of Receiving Side

(1) Explanatory meeting

(2) Radio measurement vehicle

(3) Call center



“Rapid radio measurement”
Blue road indicates “recieve condition is good”

Overview of Trial Complete Migration in Certain Area

Purpose: 1. Simulation of termination of analog broadcasting in nationwide
2. Publicity of termination of analog broadcasting toward people

May 29 Call center was established

【The first step (to the short-time suspension)】

1) Send out the notice on the one-hour suspension to every household
2) Broadcast the notice on TV (approx. 5 times a day from July 10)

July 24 Short-time suspension

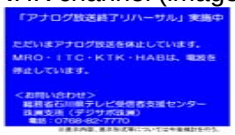
【The second step (from short-time suspension to long-hour suspension)】

1) Evaluate the short-time suspension
2) Analysis of telephone call during for short time suspension
3) Publicize the long-hour suspension as well as the complete cut-off

Outline of long-hour suspension for Jan 22-24

The operation of the Suzu analog relay station will be suspended for 48 hours from noon of January 22.

NHK channel (image) Commercial broadcasters' channels



Noon of Jan 22 to noon of Jan 24
Long-hour suspension

【The third step (from long-hour suspension to complete cut-off)】

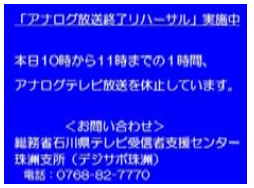
1) Evaluate the long-hour suspension
2) Publicize the complete cut-off

Noon of July 24
The preceding switch-off of analog broadcasting

Outline of short-time suspension on July 24

Suzu analog relay station will stop its operation for one hour from 10-11am.

The notice on TV



Trial area

In Suzu city
About 10 thousand households

Countdown toward Switch-off in Nationwide

Purpose: 1. To make people to prepare toward switch-off
2. To prevent of information shutdown by termination of analog broadcasting

July 2008

"Analog" Logo

➢ Notification in some programs

Letter box, Notification

- ○ Sequentially, notification with the letterbox begins on analog program
- ○ NHK: From March 29, 2010
- ○ Commercial TVs: From April 2010

From July 5, 2010

➢ From January, 2011
Always letter box with notification instrument

Virtual analog switch-off with blue back screen

- ○ All broadcasts do virtual analog switch-off at the same time especially prime time.

From July 1, 2011

June 30, 2011
Regular programs termination

➢ Notice on normal program

➢ Message to prompt to digital broadcasting

➢ "Notice" only

Noon of July 24, 2011

Analog broadcasting termination

Promotional Scheme for the Complete Switchover to Digital Broadcasting

General Headquarters for Digital Terrestrial Broadcasting, MIC

Established: September 6, 2007 [MIC]
Organization: Headed by the MIC Minister and involving all MIC executive offices and related divisions
Objective: To promote comprehensive and systematic measures as the ministry in charge, in the final stage towards the complete migration to digital terrestrial broadcasting

Inter-Ministerial/Agency Liaison Meeting for the Complete Migration to Digital Broadcasting

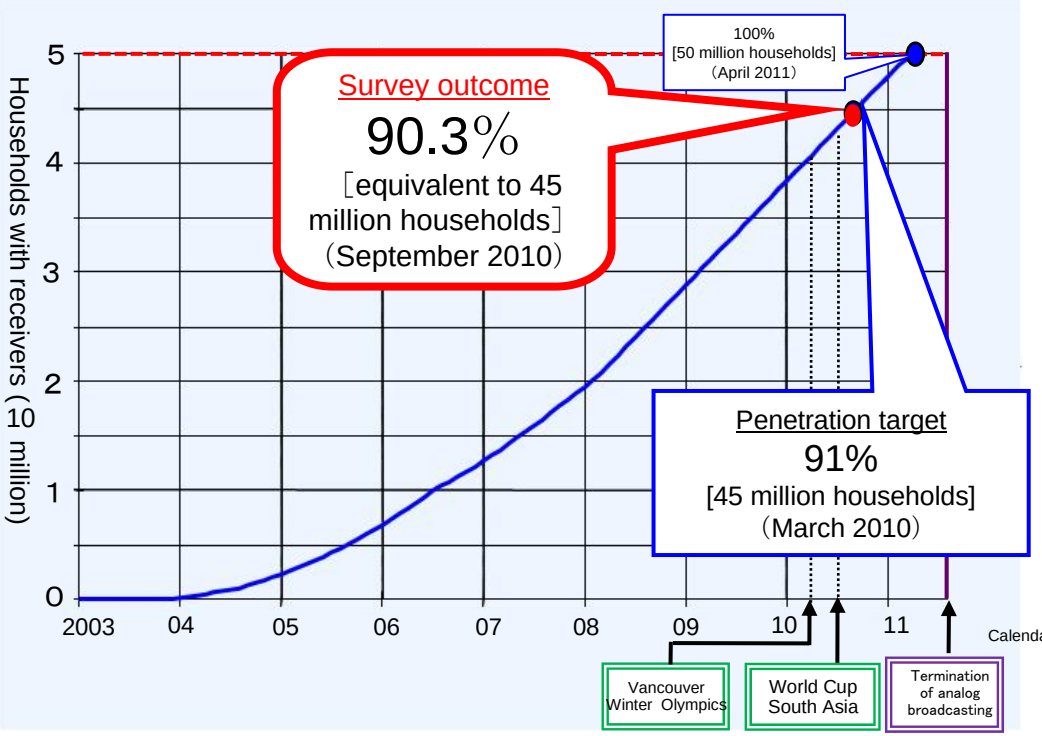
Established: September 26, 2007 [the Cabinet Secretariat]
Organization: Chaired by the Councilor of the Cabinet Secretariat (attached to the Assistant Chief Cabinet Secretary), involving all related ministries and agencies
Objective: To enhance cooperation across the ministries and agencies concerned in order to facilitate smooth transition to digital broadcasting, giving due consideration to the termination of analog broadcasting by July 2011 as digital terrestrial broadcasting moves into full operation

The Terrestrial Digital Broadcasting National Movement Headquarters

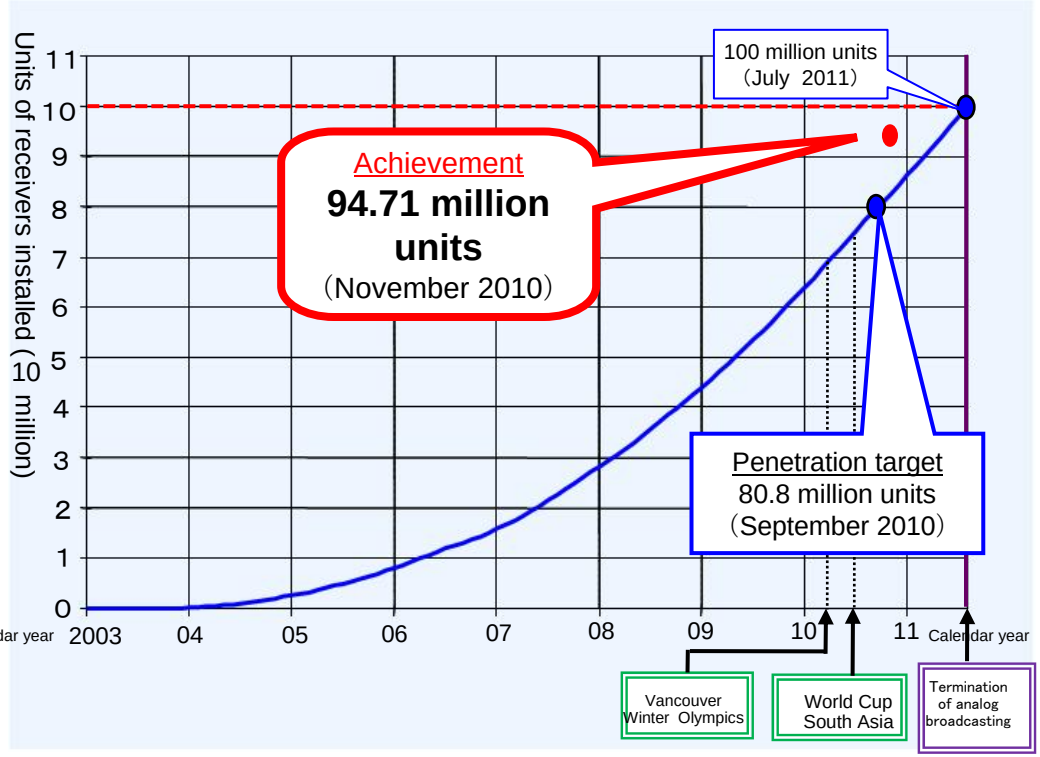
Established: July 24, 2008
Organization: Headed by the MIC Minister, involving broadcasters, manufacturers, retailers, economic organizations, consumer/elderly associations, local governments, and other related groups.
Objective: To accelerate and promote the digital switchover from the perspective of the general public by forming a national movement that unites all the related parties, including thorough education consultations, and assistance to community-level efforts.

Result: Current State of Penetration of Digital TV Receivers

Achievement and target in terms of number of households equipped with receivers



Achievement and target in terms of units of receivers shipment



Source: 'Penetration survey by MIC on digital terrestrial broadcasting(March 2009)' was referenced for percentage of Households equipped with receivers and recognition rates about analog broadcasting termination time.
Surveys; by JEITA and Japan Cable Laboratories(end of September 2009) were referenced for units of receivers installed

ISDB-T Receiver (Fixed) Shipments in Japan

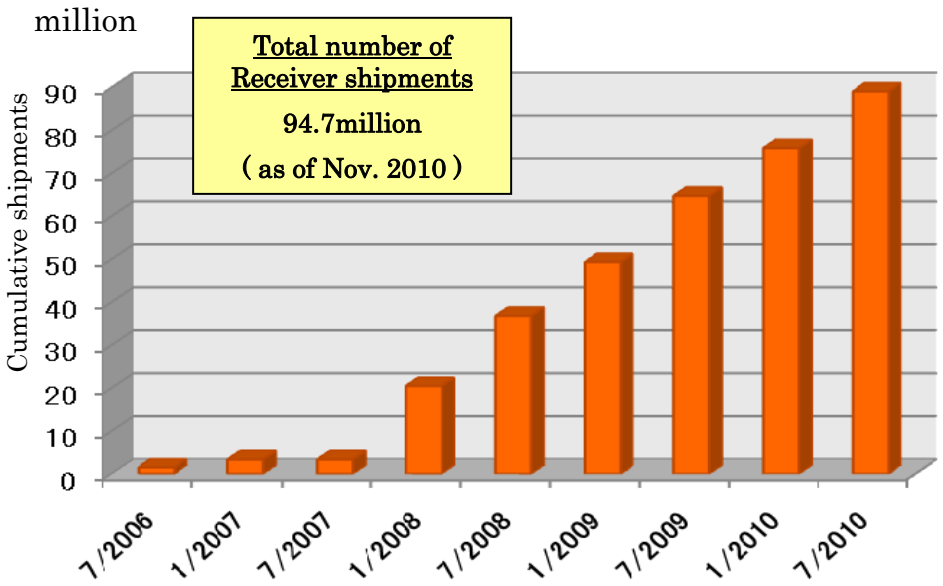
94.71 million

PDP & LCD TV	62.44
CRT	0.72
D-Tuner	3.27
STB for CATV	9.85
Recorder	18.44

As of Nov. 2010

ISDB-T Receiver Shipments in Japan

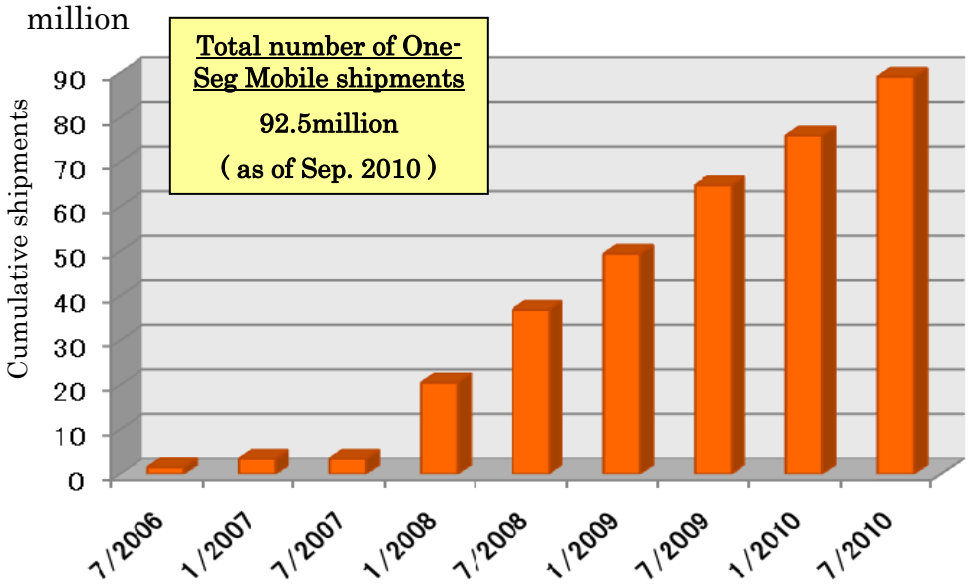
Fixed



Cumulative shipments of Digital Terrestrial Broadcasting receivers *

* Digital Television + Terrestrial Digital Tuner + Cable Digital STB

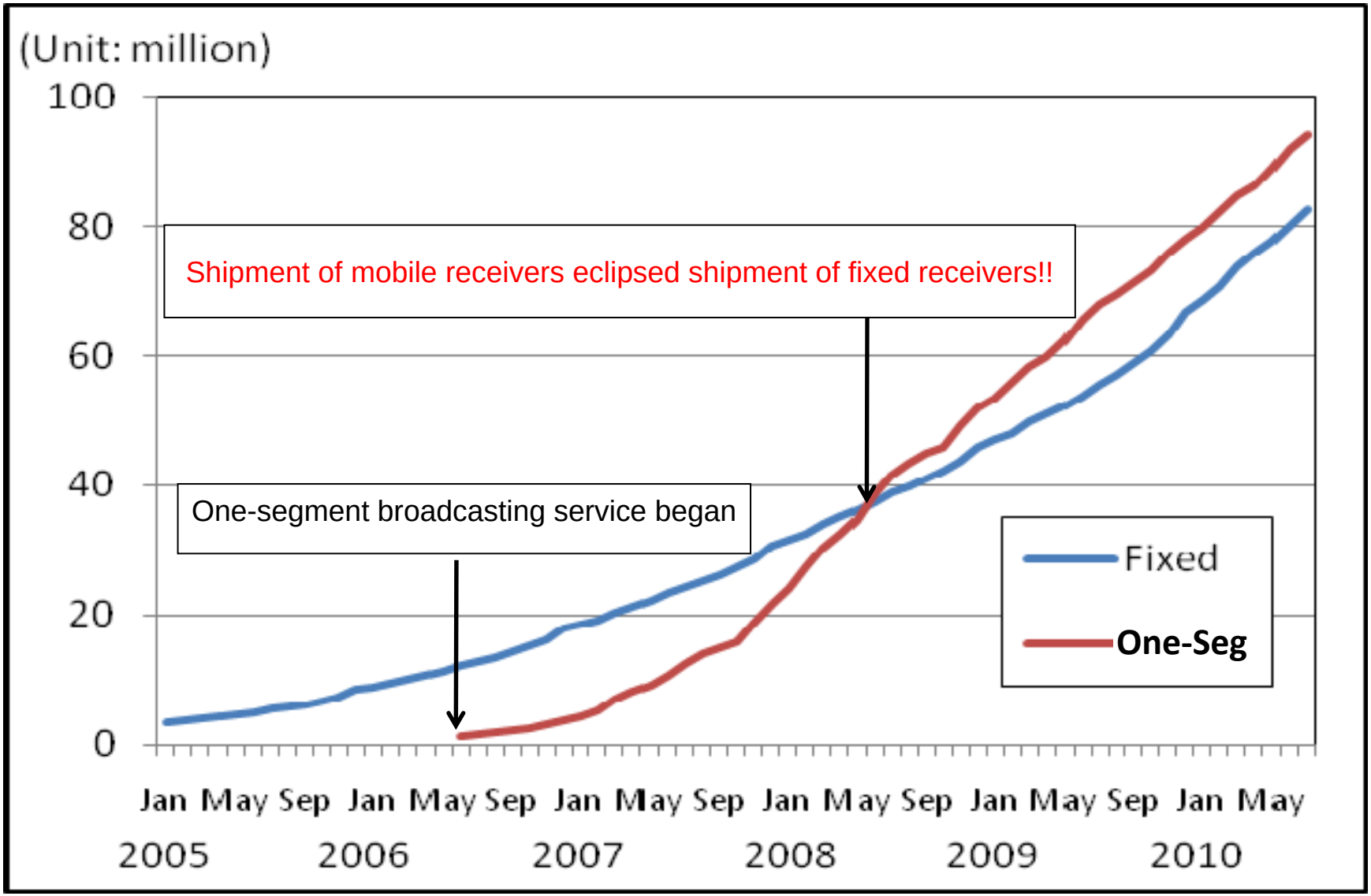
One-Seg



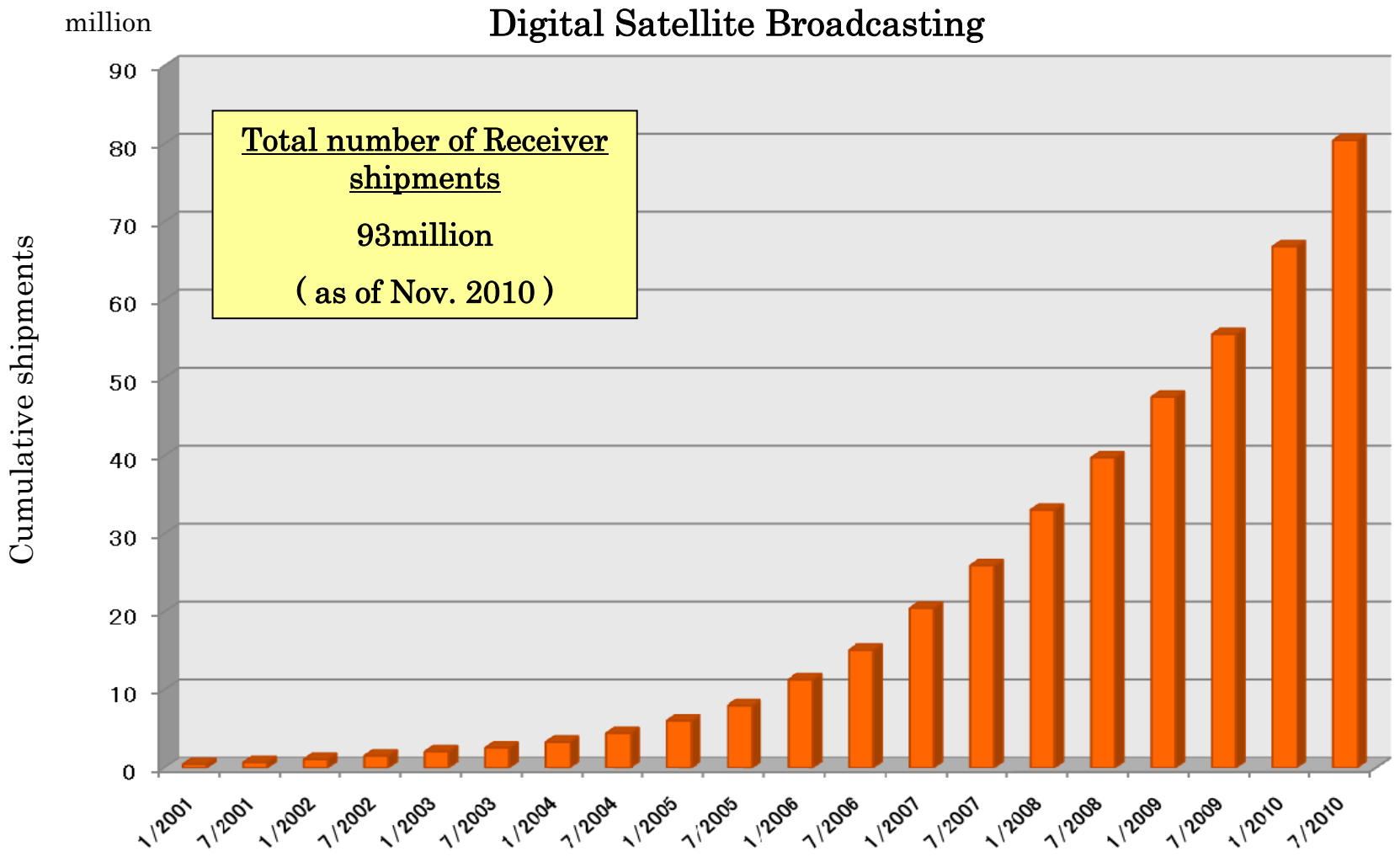
Cumulative shipments of Mobile phone with One-Seg tuner

(Total number of Mobile Phone: 118 million in 7/2010)

ISDB-T Receiver Shipments in Japan



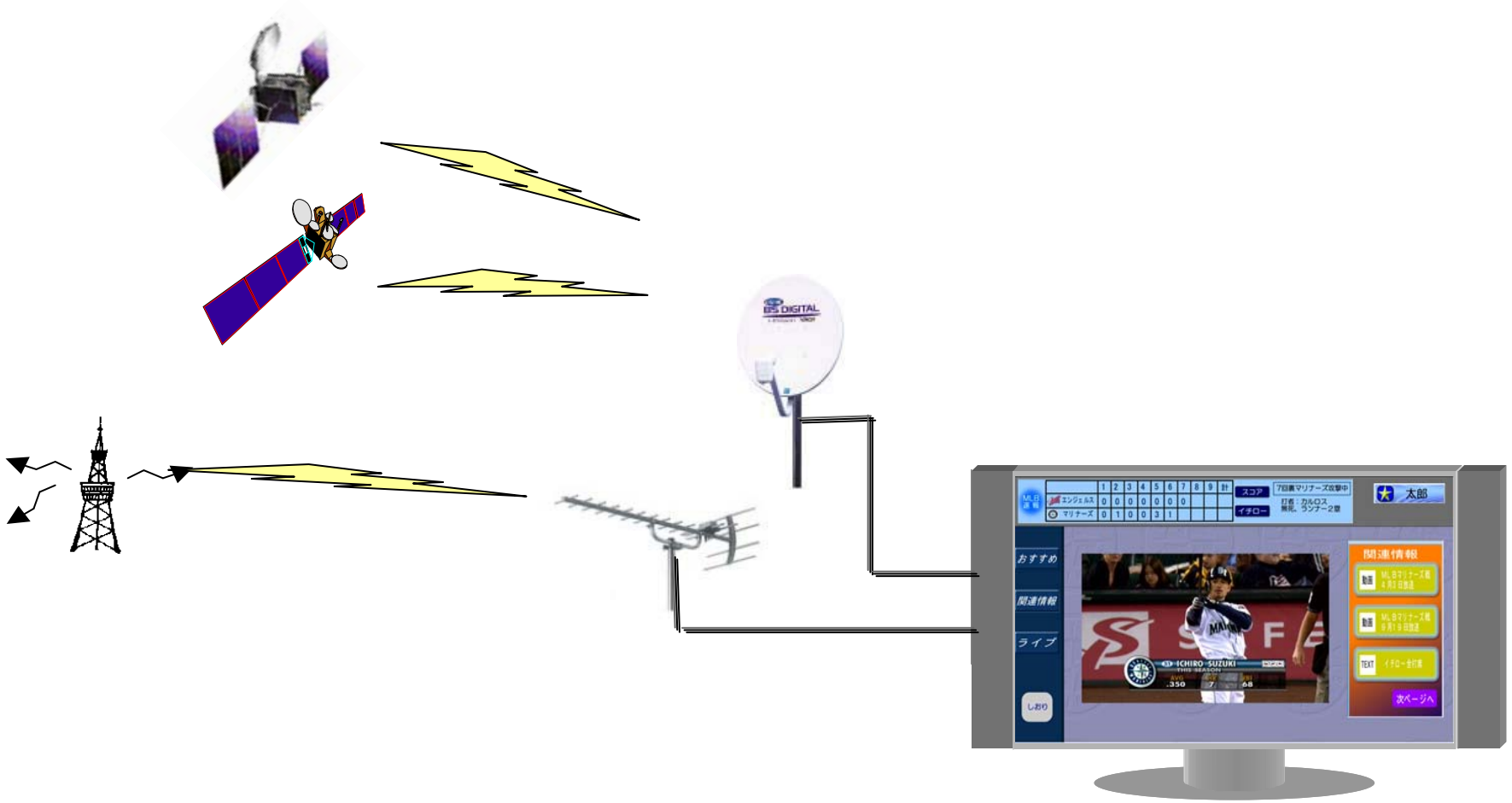
ISDB-S (Digital Satellite Broadcasting) Receiver Shipments in Japan



Cumulative shipments of Digital Satellite Broadcasting receivers *

* Digital Television + Satellite Digital Tuner + Cable Digital STB

Typical ISDB Receiver in Japan



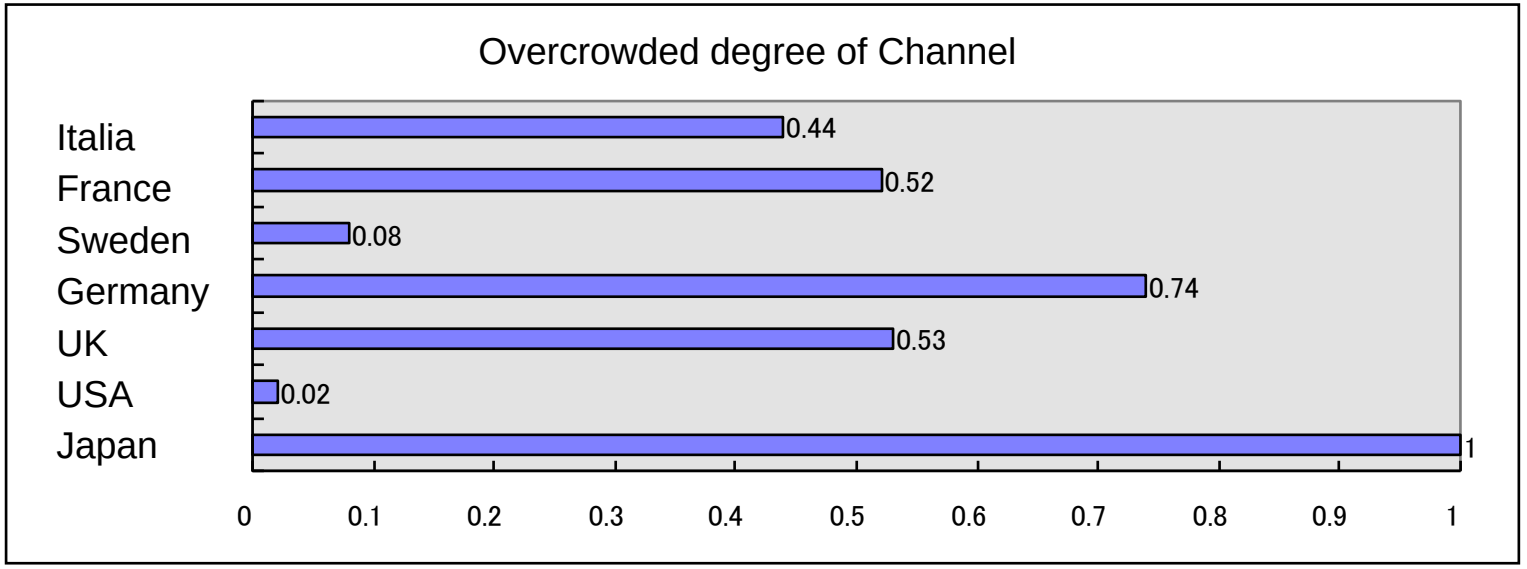
Perfil de Japón

- Población 127 millones
- Número de hogares 50 millones
- Superficie de Japón 378,000km^2
- Receptores de TV 100 milliones
  （160 milliones）
- Red de TV terrestre 6 redes grandes

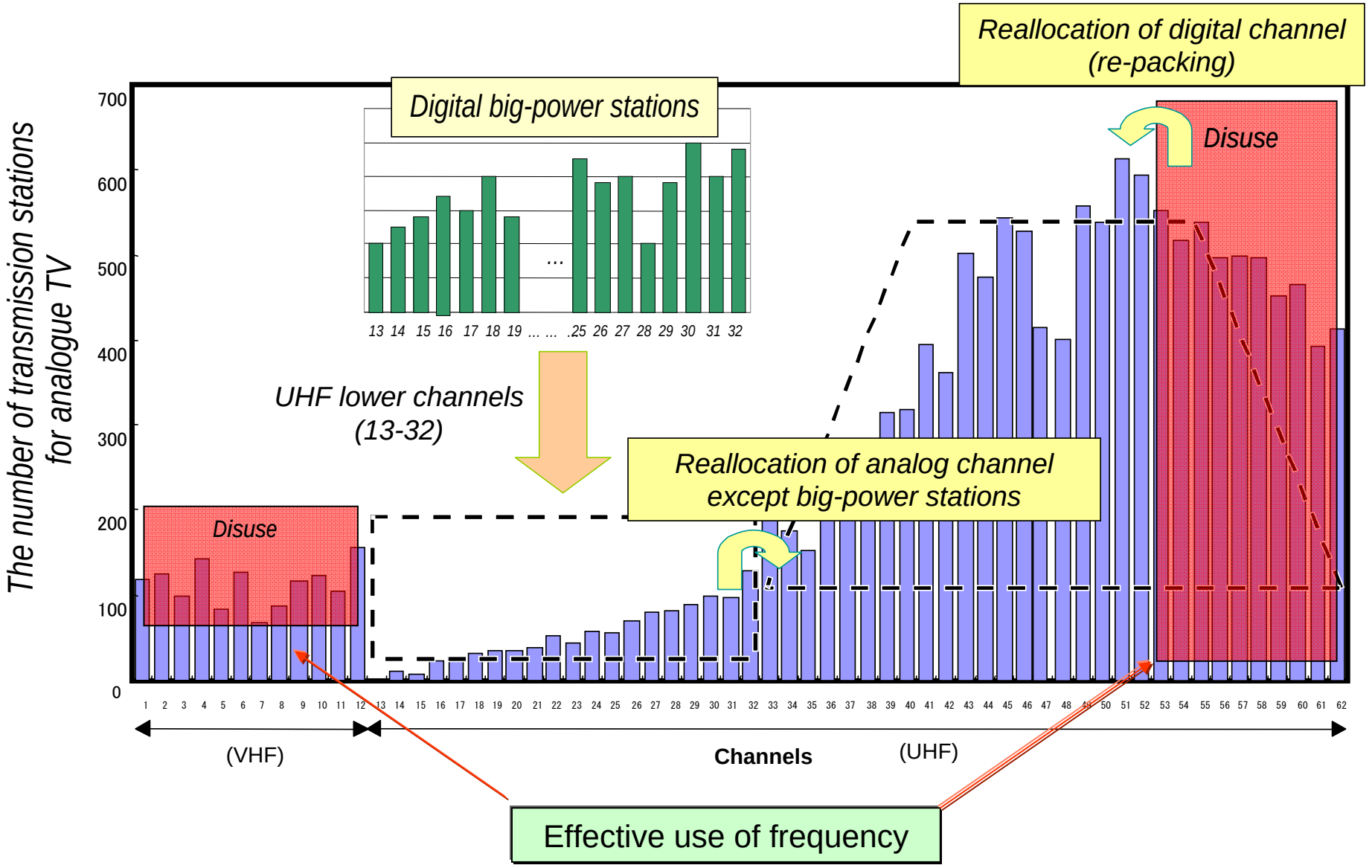
Red de NHK 2,100 repetidoras Digital
（3,500 repetidoras Analogue）

Analogue TV Channel Congestion

	No. of Stations	No. of Channels	Overcrowded degree
Italia	5,087	60	0.44
France	10,244	57	0.52
Sweden	1,297	54	0.08
Germany	8,445	51	0.74
UK	3,750	45	0.53
USA	8,456	68	0.02
Japan	14,973	62	1



Analogue channel allocation in Japan



Digital conversion for covering all households

49.6 million （all households）

48.6 million
(98%)

0.75 million
(1.5%)

0.23 million
(0.5%)

Digital Radio Wave

Cable TV
23 million

Community
reception
for apartment
houses

17 million

Direct reception

For recovering of
interference caused
by ....
8 million

shadows

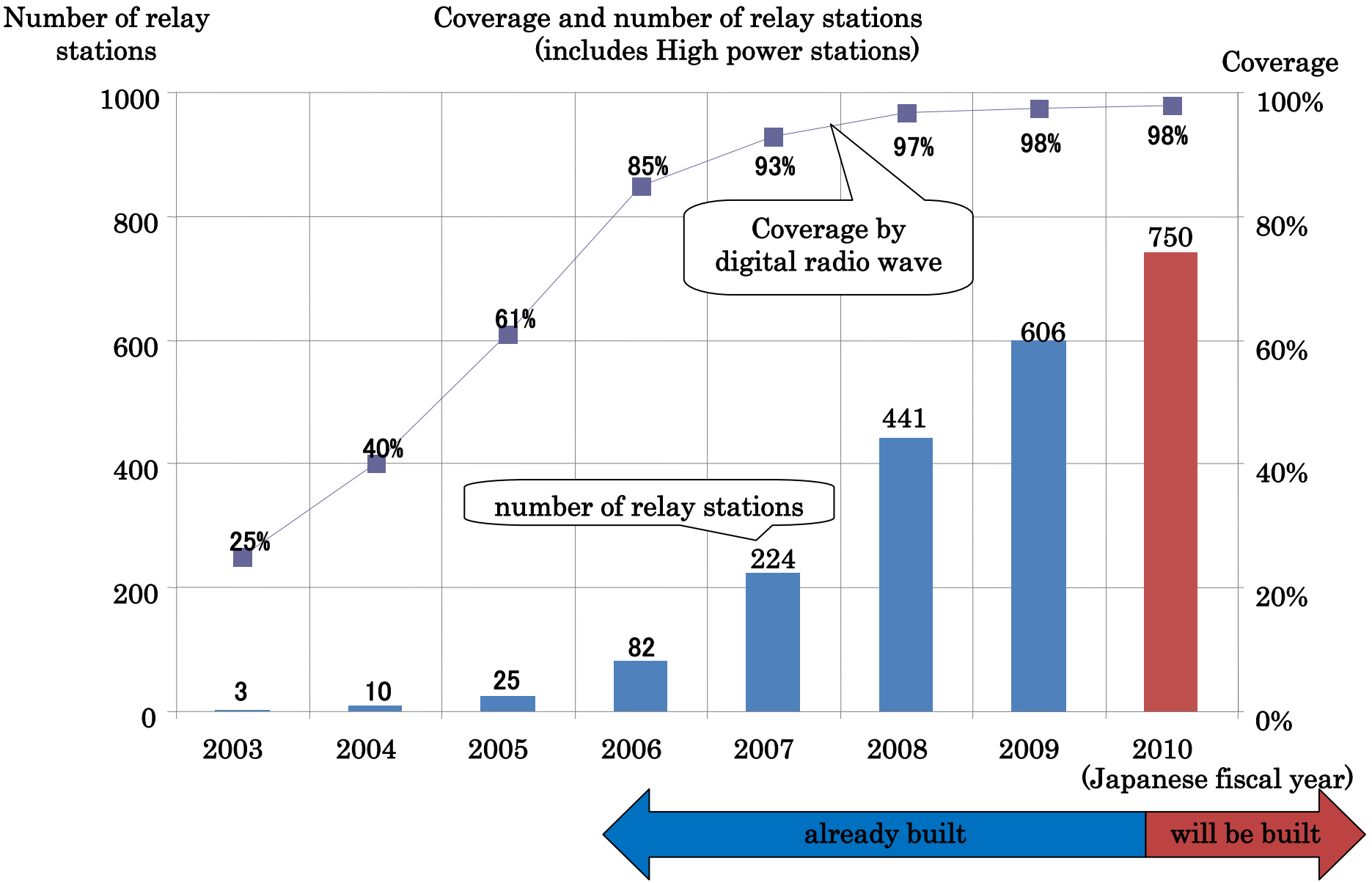
power cables

railway

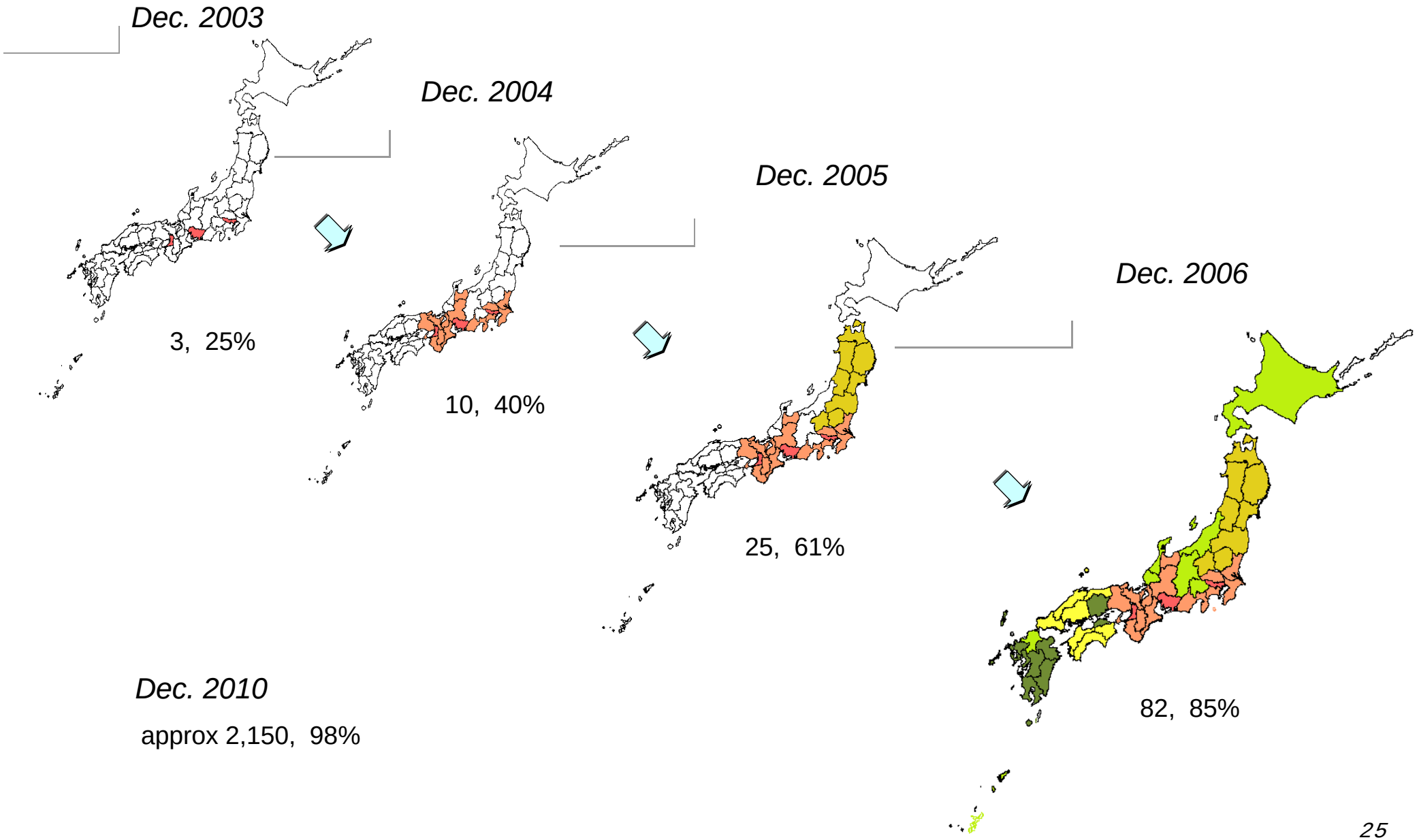
Community
reception
in the rural areas
0.75 million

Coverage
lost
after DTV
transition
0.23million

Construction plan of digital relay stations

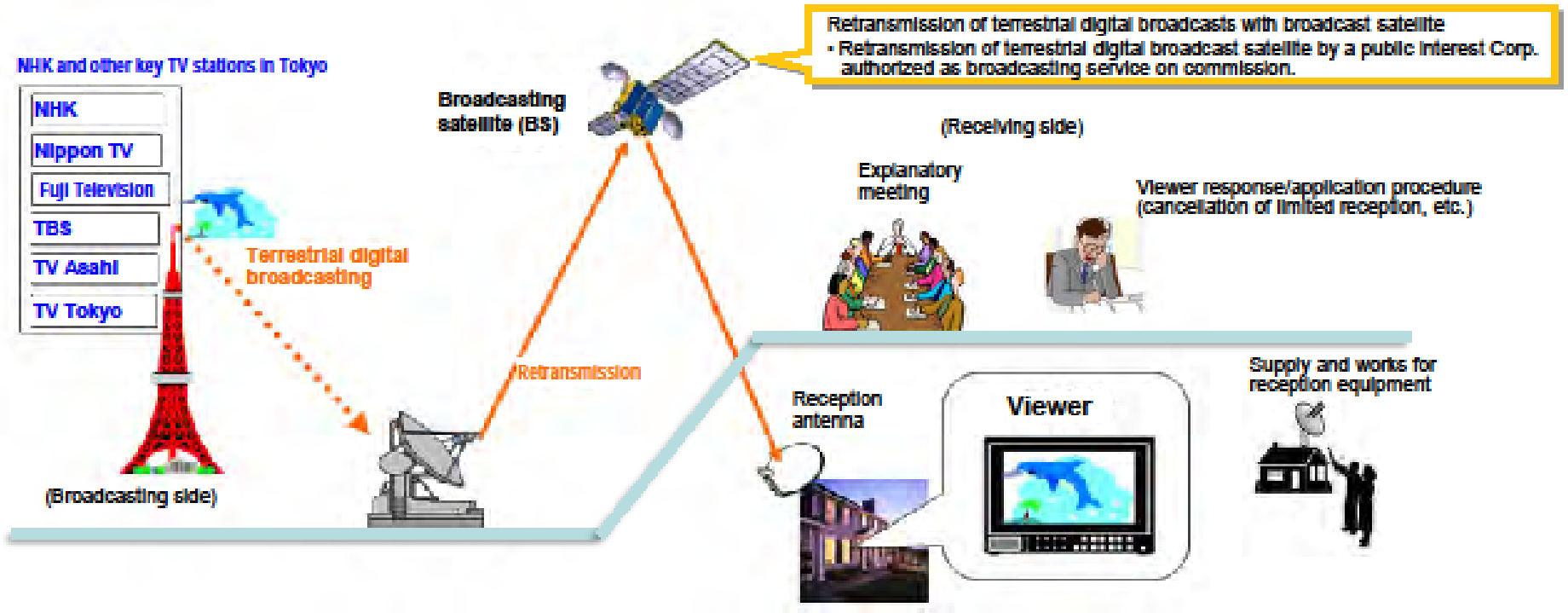


Expansion of digital service area in Japan

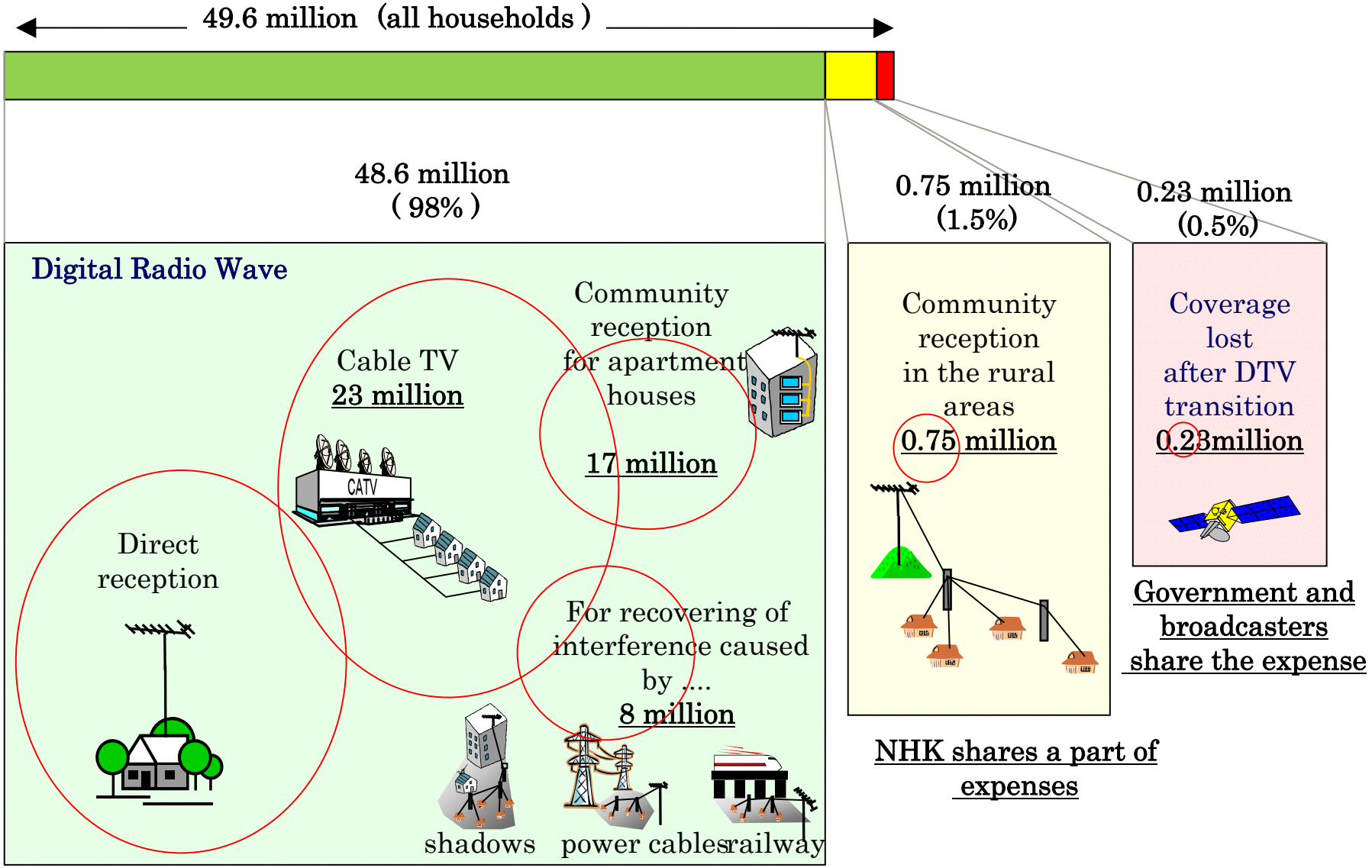


Solving Poor Reception by Temporarily Using a Satellite

In order to ensure that no viewer is left out from DTT reception even after all conceivable efforts are made to prepare for the termination of analog broadcasting in July 2011, the national government grants subsidy to operators that retransmit digital terrestrial broadcasting via satellite as an emergency and tentative measure that will be continued until the deployment of infrastructures for DTT broadcasting is completed. At the same time, the government implements necessary measures regarding DTT reception.



Digital conversion for covering all households



24 de Julio, 2011

¡ Apagón !

¡ Nos quedan 220 días !

Acerca de la NHK (Japan Broadcasting Corporation)

Unica corporación de radiodifusión pública en Japón.
Desde 1925

- Finanzas

  las cuotas de recepción
  (deben pagar los hogares que poseen televisión)
  Con ello se pretende que las emisiones no sólo sean
  imparciales y libres de la influencia de organizaciones políticas o privadas,
  Sino que también den prioridad a las opiniones de la audiencia.

- Televisión terrestre

  - Dos canales ; Televisión General, Televisión Educativa (Digital y analogíca)

- Televisión por satélite directo

  - Tres canales

- Radio

  - Dos AM, Un FM

- NHK WORLD（http://www.nhk.or.jp/nhkworld/）

  Servicio internacional de televisión, radio e Internet.