

# Japan's Experiences for Digital Terrestrial TV Broadcasting

## Part 3

### Digitalization Process, Awareness and Impact of Digital TV in Japan

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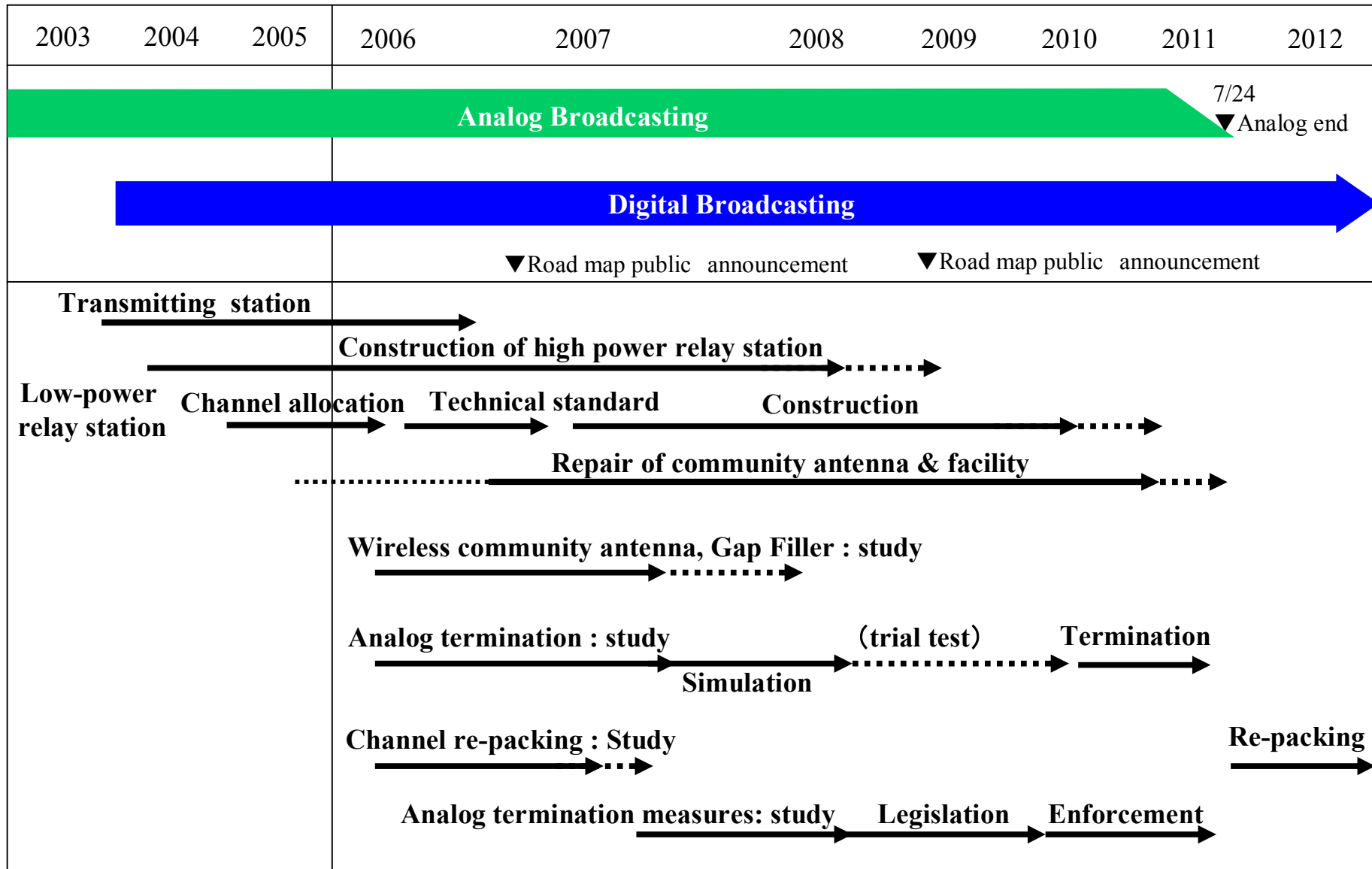
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# 1. Digitalization Process in Japan

This Presentation document is based on the presentation document (note) of “DTV workshop in InterBEE” held in November last year.

(note) Presented by Mr.Takayama, National Council for Promotion of Terrestrial Digital Broadcasting

# Road map of Digital Terrestrial TV

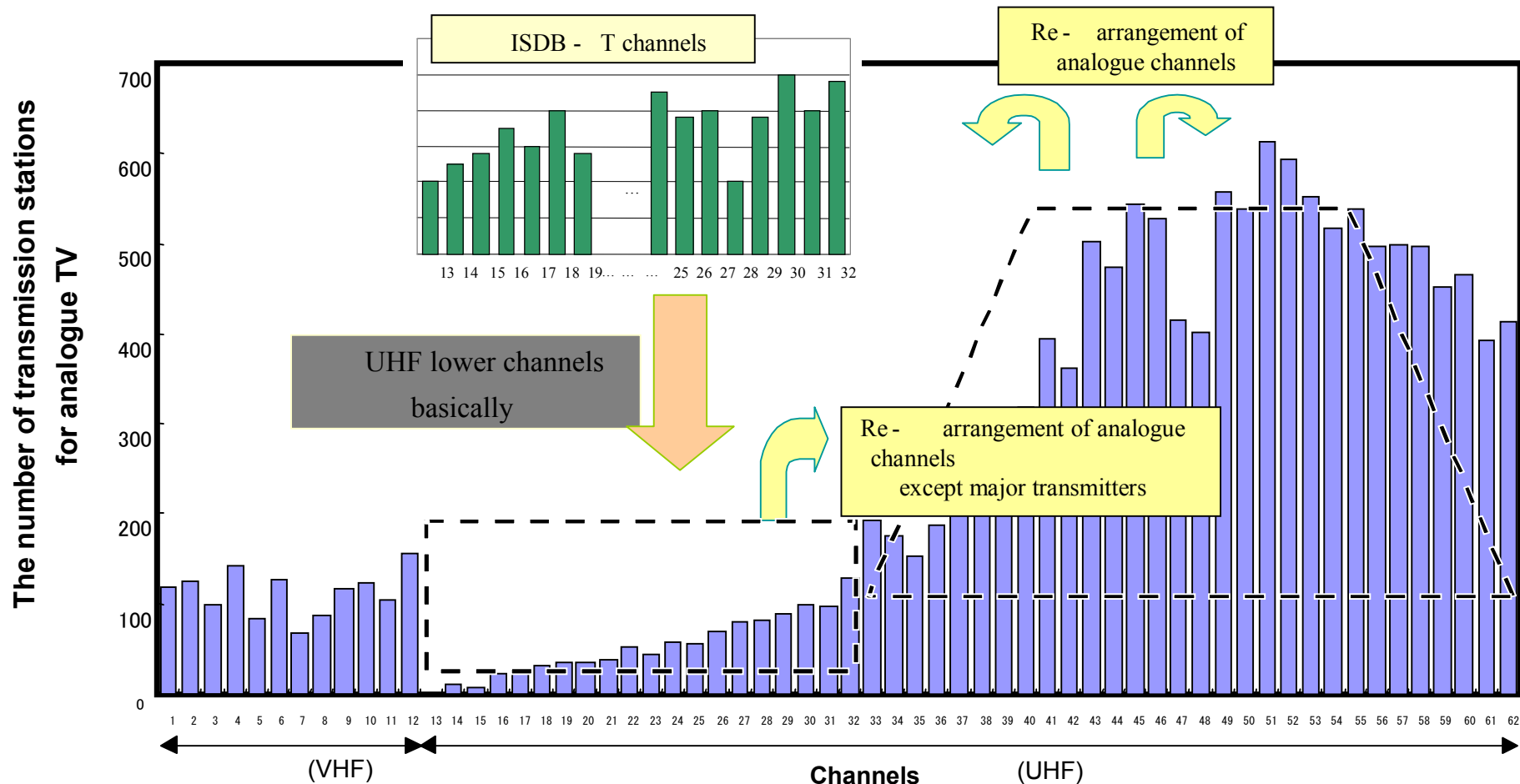


## Transition to Digital Terrestrial TV (~2006)

- Policy Decision of Analog-Digital Simultaneous Broadcasting (Oct.1998)
- Digital Channel Allocation  
(Transmitting Stations & High-power Relay Stations) (July 2001)
- Analog to Analog Channel Reallocation (Feb.2003)
- Construction of New Digital Broadcasting Stations
- Digital Transmitting Stations Started the Services (Dec.2003)
- Road Map Publication of Digital Relay Stations (Dec. 2005)
- Spread Through the Whole Country (Dec. 2006)

# Analog to Analog Channel Reallocation

Complete simultaneous broadcasting (starting digital broadcasting while continuing analog broadcasting) needs channel reallocation of existing analog TV site to make channel space for digital broadcasting. The lower channels(13-32) in which the number of existing analog TV sites is very few are mainly allocated for digital transmitting stations and high-power stations.



# Example of Analog to Analog Channel Reallocation

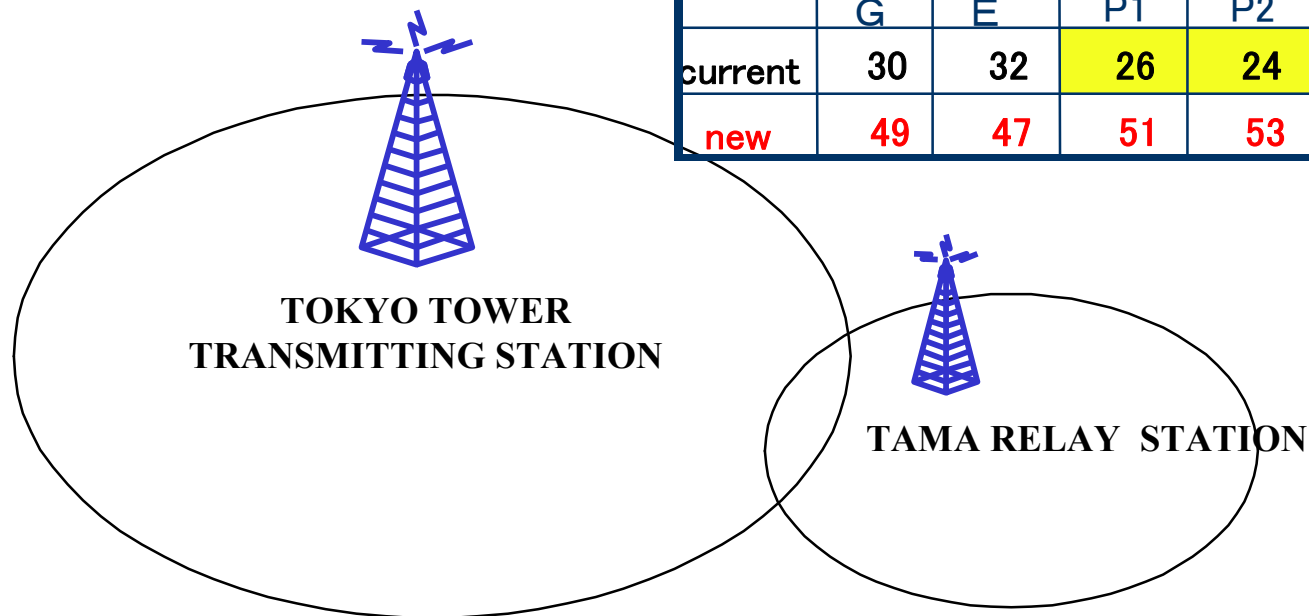
**Channel Reallocation of TAMA RELAY STATION (from 18~32ch to 47~59ch)  
makes the Channel Space for TOKYO TOWER TRANSMITTING STATION.**

**TOKYO TOWER TRANSMITTING STATION (DIGITAL)**

G	E	P1	P2	P3	P4	P5	PL	放大
27	26	25	22	21	24	23	20	28

**TAMA RELAY STATION (ANALOG)**

	G	E	P1	P2	P3	P4	P5
current	30	32	26	24	22	20	18
new	49	47	51	53	55	57	59

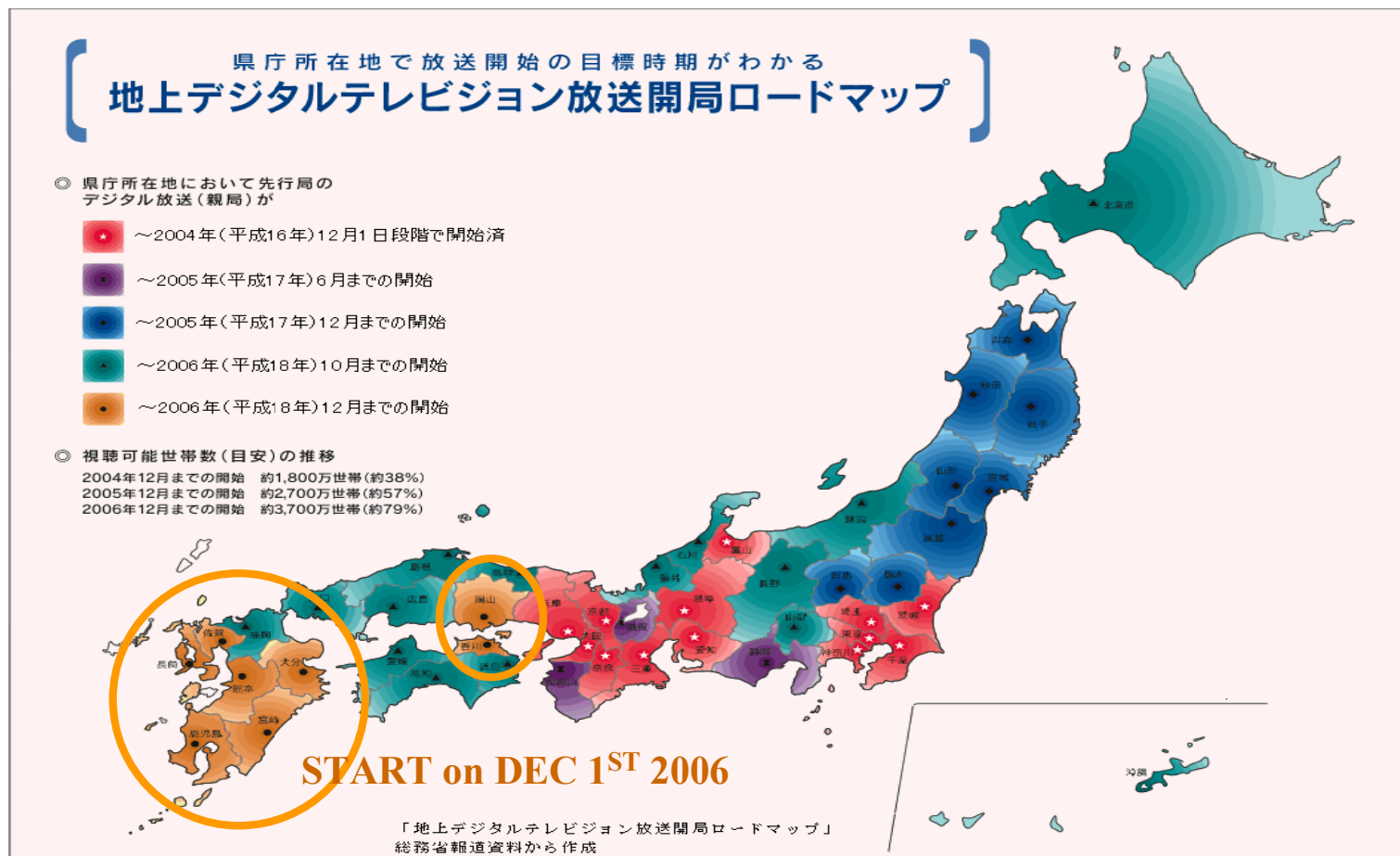


# Service Schedule of Digital Transmitting Station

● **Direct Reception : 39 prefectures 35.7 million households (Japanese total 76%)** (Oct. 2006)

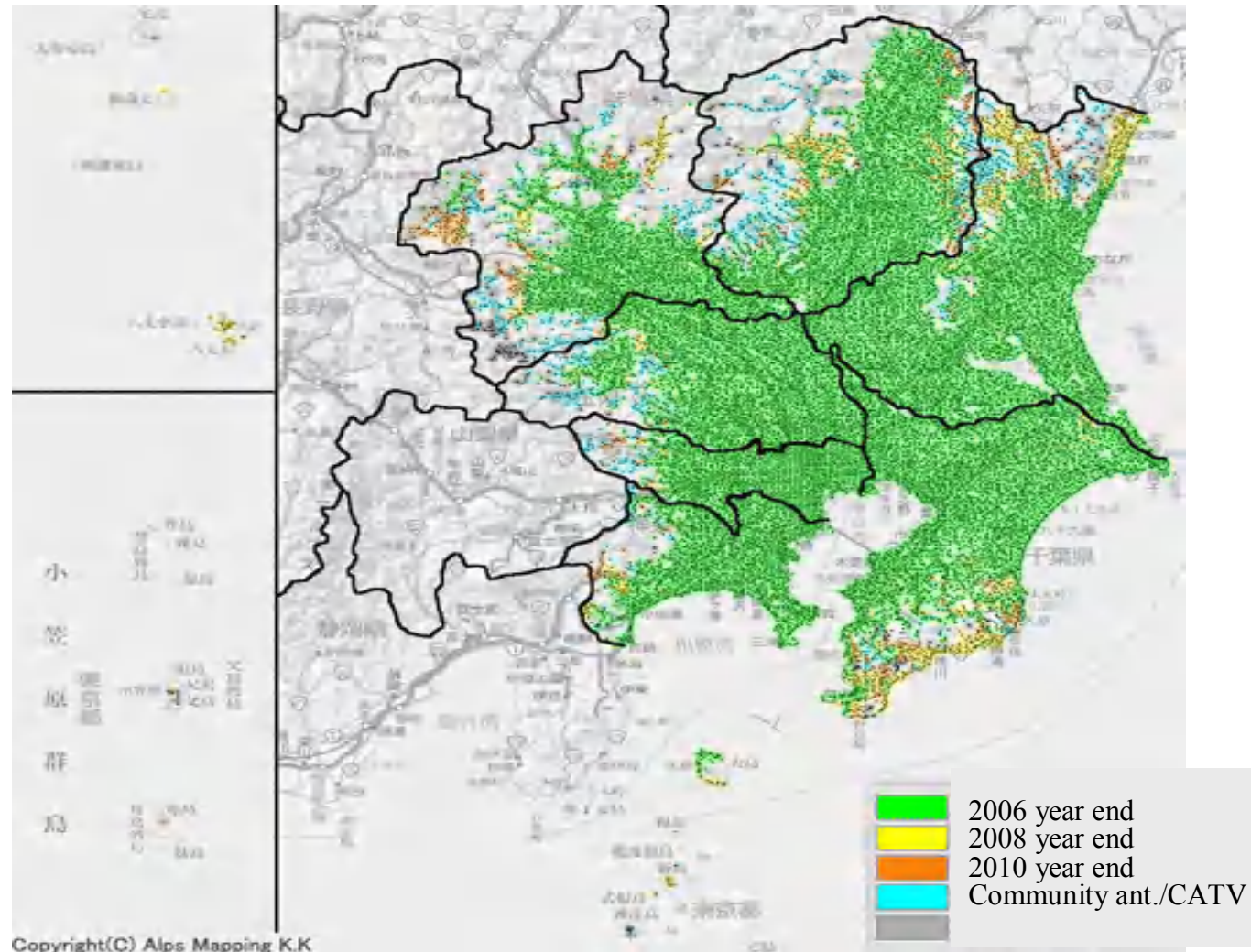
The service will start in Kyushu (except Fukuoka) and Kagawa, Okayama area on Dec. 1 and spread through the whole country **37 million households (79%)**.

● **via CATV: 12.8 million households** (Mar. 2006) (by JCTA)



# Road Map of Digital Relay Stations Construction (Kanto Area)

**Relay stations and Community Antenna or CATV will start service  
on the end of 2010**





# Towards full-scale completion of the Digital Broadcast

(2006~)

1. Completion of Relay Stations Networks by 2010
2. Completion of Digital View- environment
3. Preparation to Termination of Analog Broadcasting
4. Repacking Digital Channel after 2011
5. Summary

It is not enough time to present all items shown above.  
Therefore, present mainly for item 1 and 2

# **1. Completion of relay stations networks by 2010**

1.1 Channel Allocation of low-power relay stations

1.2 Construction of relay stations (2008~2010)

1.3 Number of digital stations constructed year by year

1.4 Short term completion method of relay station  
construction

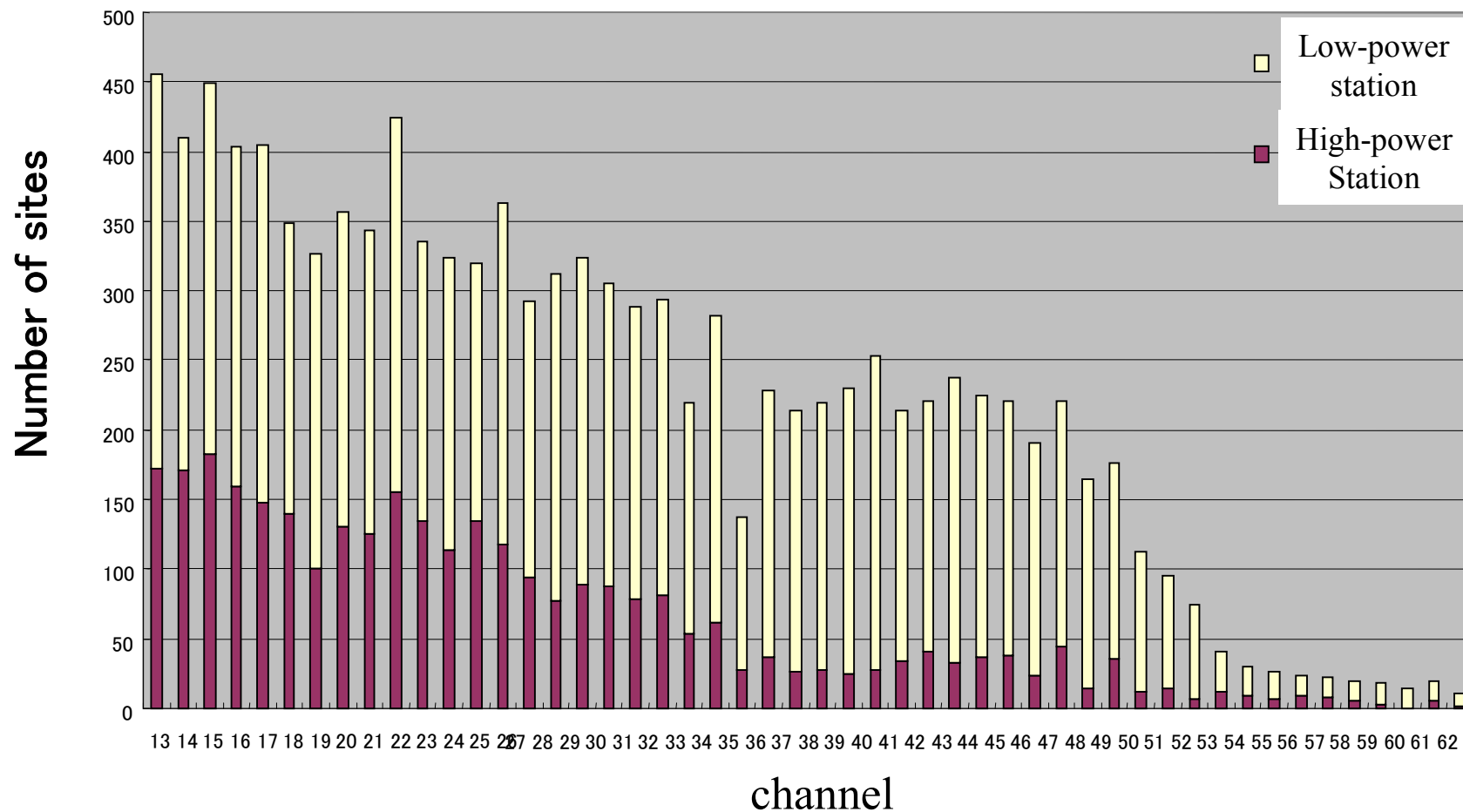
1.5 Measures to avoid interference on transmitting site

1.6 Measures to avoid interference on receiving site

1.7 Techniques for stable operation of broadcast-wave  
relay network

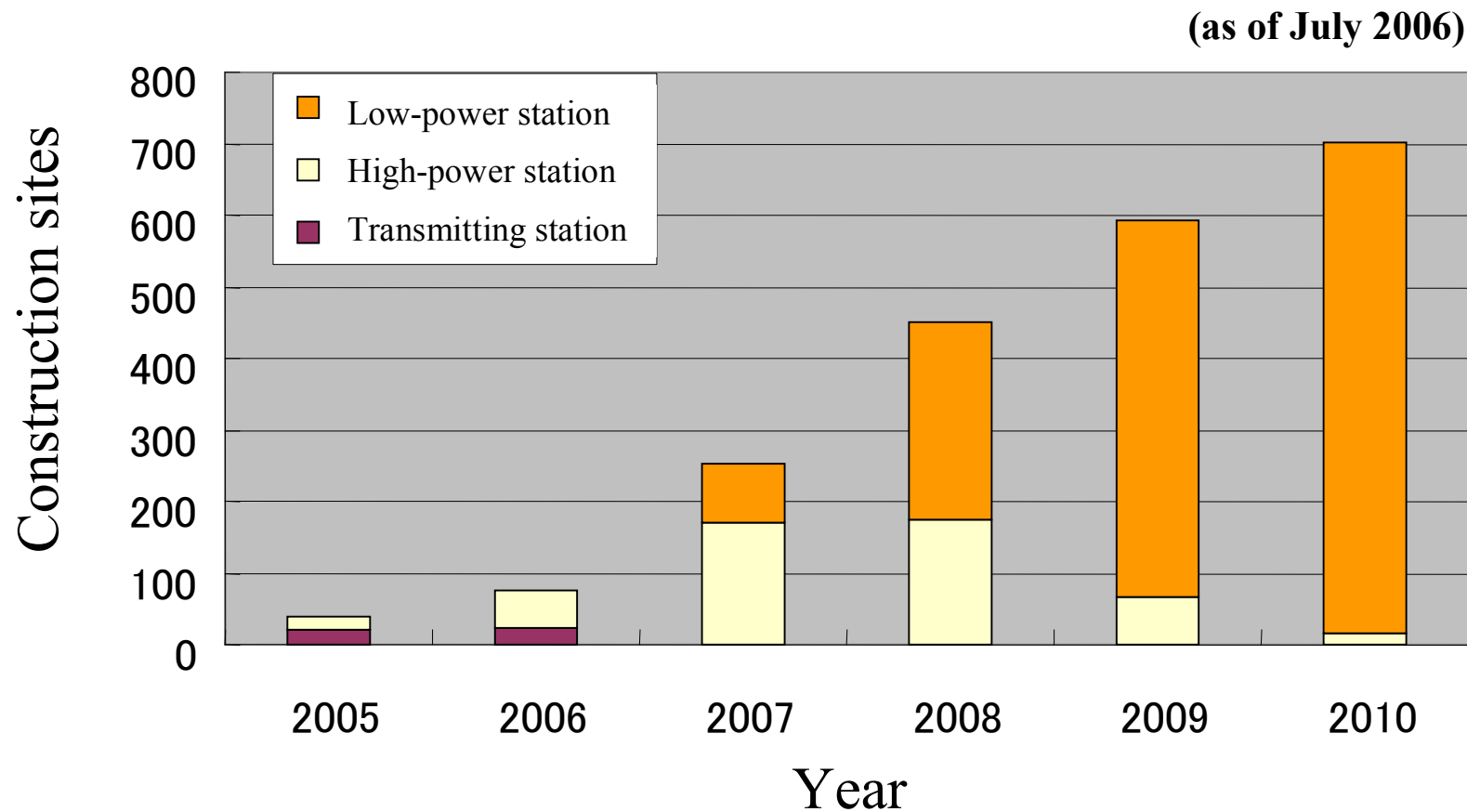
# 1.1 Channel Allocation of low-power relay stations

**Transmitting stations and high-power stations use lower channels mainly.**  
**Low-power stations use the channels from 13 to 50 approximately equally.**



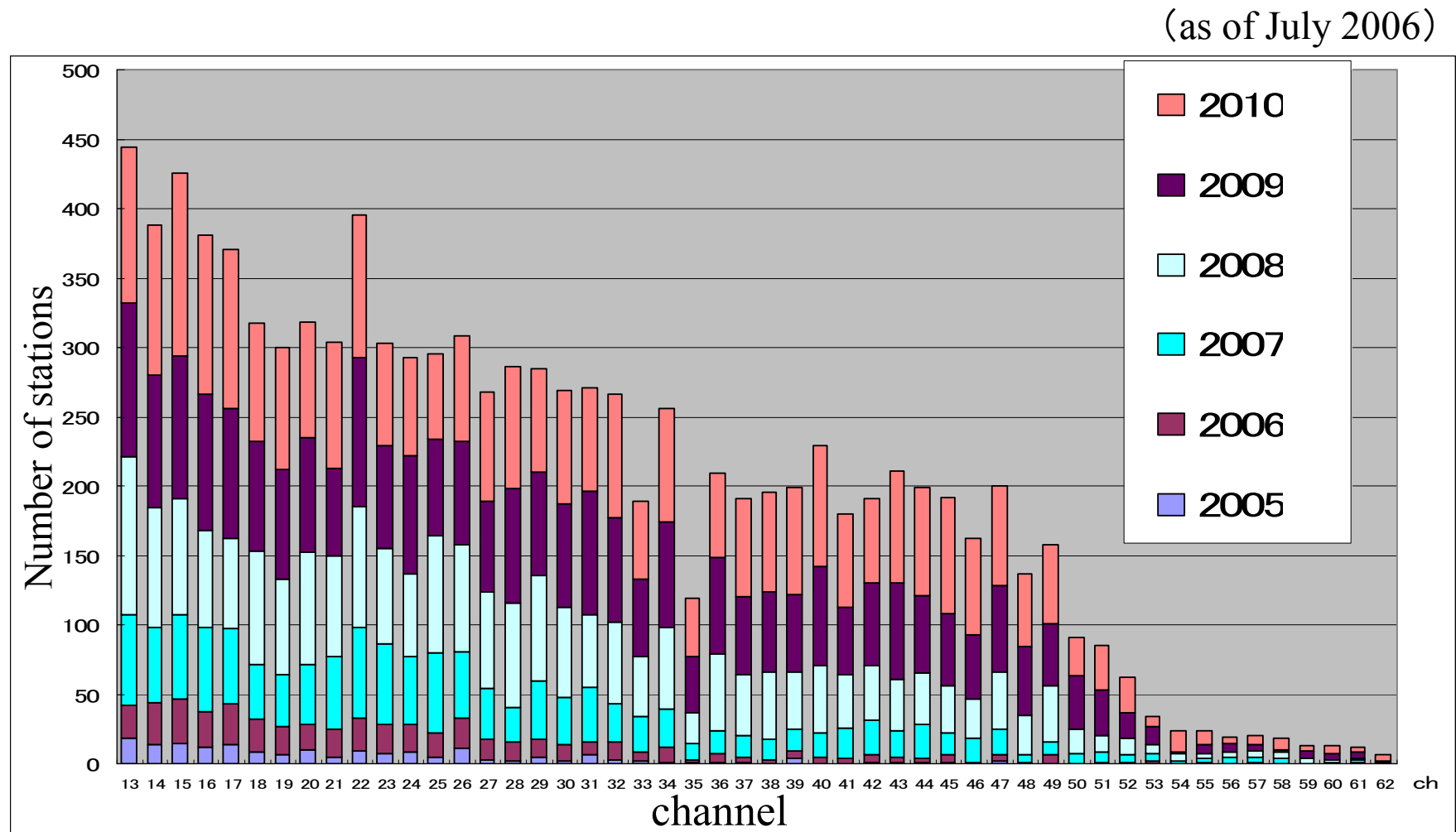
## 1.2 Construction of relay stations (2008~2010)

**As shown here, many small power stations should be constructed within short period. Cooperation of the construction companies is required**



# 1.3 Number of digital stations constructed year by year

**About 100 transmitters per a channel have to be made every year from 2008.**



# 1.4 Short term completion method of relay station construction

To realize the short term construction, following measures may be adopted.

## Conventional construction method were as follows one after the other

- 1<sup>st</sup>) several high-power relay stations at the same time with transmitting stations.
- 2<sup>nd</sup>) several medium-power relay stations.
- 3<sup>rd</sup>) low-power relay stations.
- 4<sup>th</sup>) extreme low-power relay stations



## Short term completion method (proposed)

- Efficient specification decision, manufacture and construction standardization of equipments' specification (so-called "orange book") collective construction of NHK and commercial broadcasters at same site
- Efficient ordering and construction works (full turnkey, package ordering)
- Efficient construction works (package system)
- Efficient feasibility study and transportation to the construction site series construction of relay network stations in a area

To avoid bad influence to management by construction acceleration (short term financing without interest)

## 1.5 Measures to avoid interference on transmitting site (analog-digital simultaneous broadcasting period )

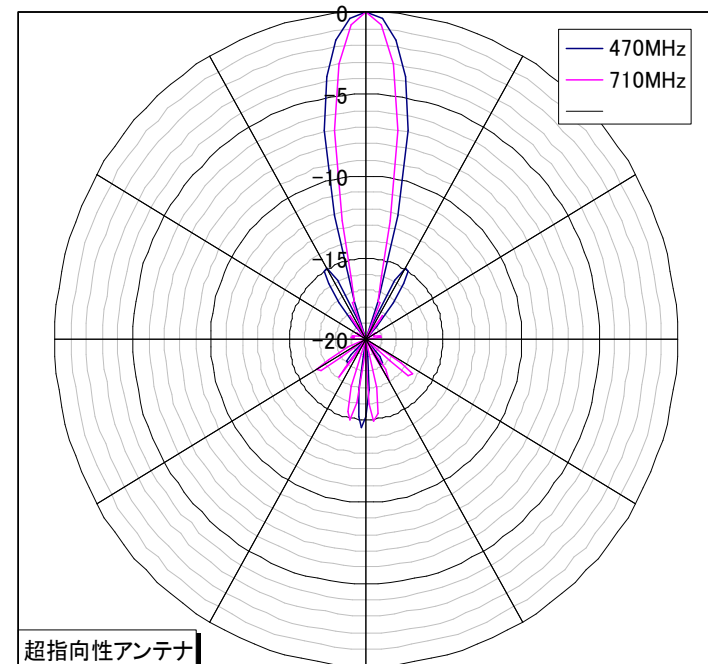
**Measures on transmitting site are efficient to avoid interference where the channel allocation is crowded.**

- **Transmitting beam pattern control**
- **Transmitting power control**
- **Canceling antenna**  
**Having the inverse phase against main antenna and installed towards the interference area in order to reduce the interference wave**
- **Power control of analog stations which interfere with others**

## 1.6 Measures to avoid interference on receiving site

**In the case interference areas lie scattered,**  
**measures are necessary for each.**

- Receiving from another stations  
Receiving the analog and digital wave from different stations
- Super directional antenna  
stacked antenna  
canceling antenna
- Receiver for SFN interference  
Receiver with waveform equalizer



Ex. Stacked antenna  
Beam width: below  $\pm 10$  degree  
(about  $\pm 30$  degree by 20 elements)



## 1.7 Techniques of stable relay transmission using broadcast-wave

**Broadcast-wave relay system has economical advantage compared to using fixed links especially for low-power relay stations.**  
**But many kinds of interference degrade signal quality.**  
**How to keep a stable the transmission and the reception is important matter.**

- SFN Coupling Loop Interference Canceller
- Multi-path Canceller
- CN Re-setter
- Co-channel Interference Canceller
- Digital Space Diversity System
- Canceling Antenna for Receiving
- Variable Beam Direction Array Antenna

## 2. Digital Broadcasting Promotion Activity

2.1 Promotion of receivers and receiving system

2.2 Guidance of digital reception system

2.3 Enlightenment of receiving digital broadcasting at  
community antenna (remote area, apartments)

2.4 Realization of receiving digital broadcasting in bad  
condition area

2.5 Grasp of the promotion and judgment of the completion

# 2.1 Promotion of receivers and receiving system

**About 0.51 million receivers (at starting point) → 13.85 million**

(September 2006, by JEITA & JAPAN CABLE LAB)

**PC with digital tuner: 0.175 million**

**Mobile phone with one segment tuner: 1.187 million (June 2006)**

Fig. 1 Numerical targets on number of households (Roadmap)

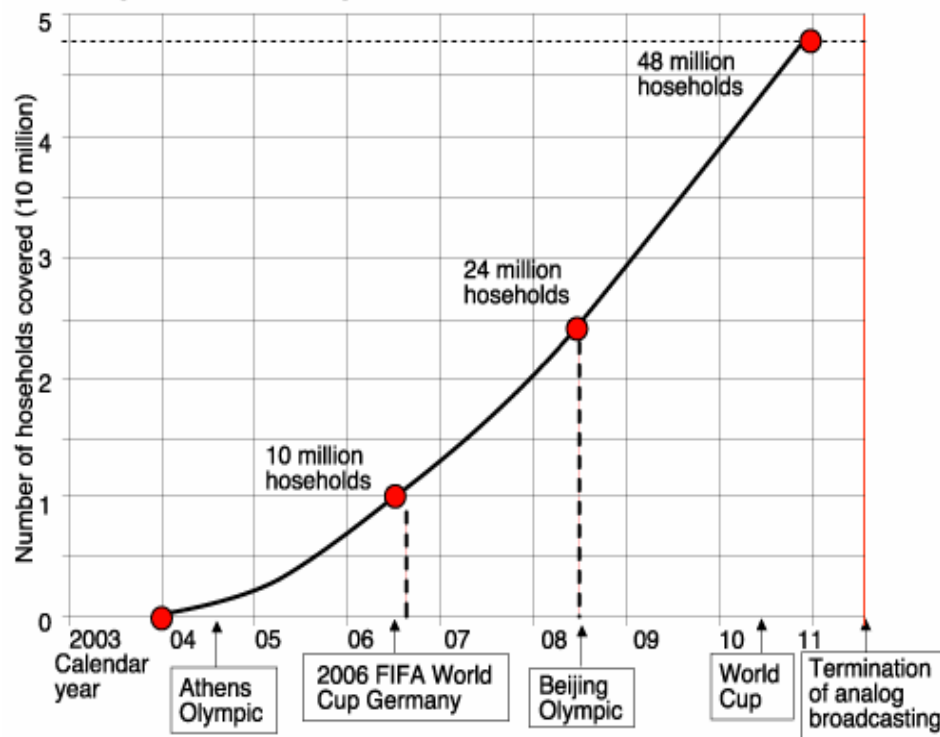
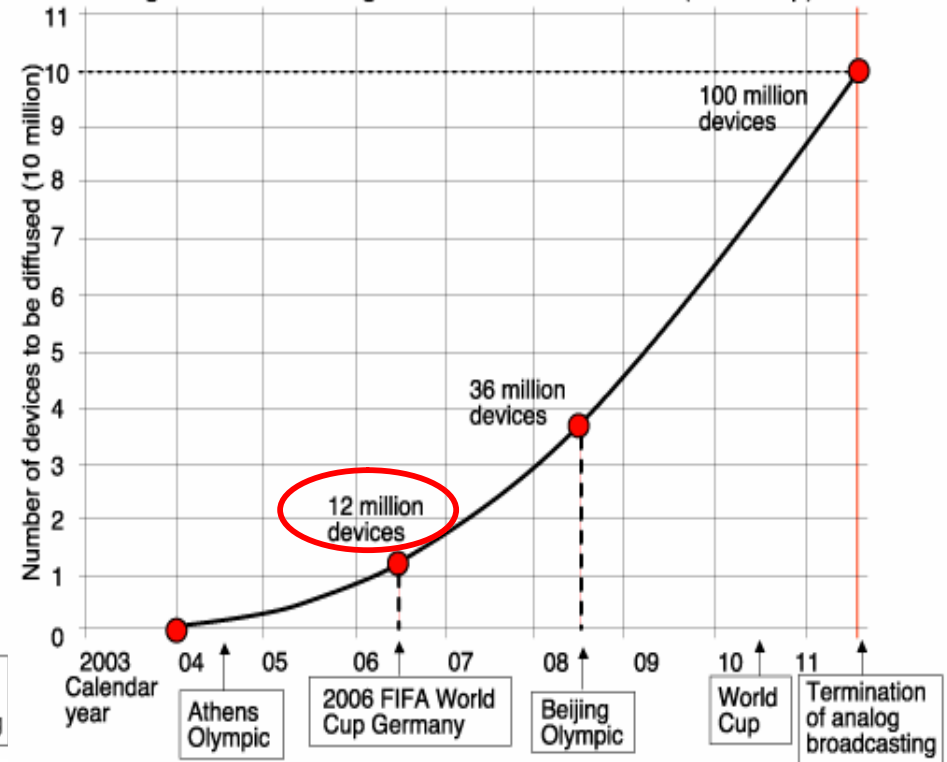


Fig. 2 Numerical targets on number of devices (Roadmap)



## 2.2 Guidance of digital reception system

**It is necessary to guide reception systems that add the digital reception to analog viewers in the same apartment while continuing the analog reception.**

- Digital reception is possible by existing UHF reception system.
- Addition of UHF antennas and area specific combiners
  - existing VHF reception
  - reception from a digital station different from the existing UHF station.
  - addition of digital reception to multi-directional reception
  - change to the new relay station from the previous transmitting station.

## 2.3 Enlightenment of receiving digital broadcasting at community antenna

- **Digitalization of community reception facilities such as remote area and apartment**
  - installation of UHF receiving antenna toward digital station
  - installation of combiner when UHF analog broadcasting exists
- **Explanation to facility manager and owners of community reception facilities**
  - necessity of digital reception till 2011
  - understanding of digital viewers
- **Consulting system about digital replacement to the digital reception (JCTEA, etc.)**

## 2.4 Realization of receiving digital broadcasting in bad condition area.

- High performance receiving antenna & system
  - Very high sensitivity, super directional antenna
  - Very low noise amplifier
  - Filter to reject high level analog broadcasting signal
- Connection to Community antenna, CATV
- Receiving one segment service at fixed reception
  - (One-seg receiving box)
- Complementary measures
  - Reception of satellite broadcasting, IP broadcasting

## 5. Summary

**In order to complete the transition to digital broadcasting by July 24, 2011, following tasks should be done with cooperation of concerned organizations.**

- Ensuring same area as analog broadcasting
- Completion of construction of relay stations
- Digital receiving system : 48million households
- Digital TV receiver : 100 million sets
- Digitalization of community antenna system at remote areas
- Digitalization of common receiving facilities for apartments
- Promotion of digital receiving for CATV etc

## 2. Promotion Scheme and Public Awareness for DTTB in Japan

This Presentation document is based on the recent data of MIC(note).

(note) Ministry of Internal Affairs and Communication.



# Promotional Scheme for Expanding Digital Terrestrial TV Broadcasting Nationwide

Collaborative work among various parties as well as efforts by the government are required to complete digitization in July 2011.

- **The National Conference for Promotion of Digital Terrestrial Broadcasting (broadcasters, manufactures, electrical appliance shops, consumer organizations, local governments, MIC, etc.)**
  - Updating/revising “Action Plan for Promotion of Digital Broadcasting,” describing items to be implemented by its members and the schedule thereof
  - Developing/updating and publicizing “Roadmap for Construction of Transmitting Stations” with the cooperation of the above-mentioned Council
  - Driving forward the activities for promoting digital broadcasting by announcing December 1st as “Digital Broadcasting Day”
- **The National Council for Promotion of Digital Terrestrial Broadcasting (broadcasters and MIC)**
  - Studying challenges (both institutional and technical) involved in the transition to digital television broadcasting
- **The Association for Promotion of Digital Broadcasting (Dpa) (broadcasters, manufactures, etc.)**
  - Publicizing broadcasting areas
  - Responding to questions and inquiries from viewers

# Construction of Transmitting Stations

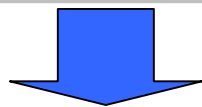
## Principles

- Broadcasters make their own efforts to cover 100% of analog TV areas where over-the-air reception is possible.
- Broadcasters complete constructing transmitting stations by 2010 at the latest.

## Current Status

- household coverage as of Dec. 2006: 84%
- expected household coverage as of 2010: 99%

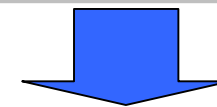
*Need for official support for covering the remaining uncovered areas ("last 1%")*



## ➤ "Roadmap for Construction of Transmitting Stations"

	Private	NHK	Total
2005-		220	630
2006	410	410	1,200
2007	750	930	2,400
2008	1,400	1,100	2,700
2009	1,600	1,300	3,000
2010	1,700		

*Accelerating the construction schedule for ensuring early availability to viewers*



## Support measures

- Official Grant for constructing transmitting stations to cover the "last 1%" (FY2007 only)
- Incentive for digital investment:
  - Preference for the national tax (corporate tax)
  - Preference for the local tax (fixed property tax, real-estate acquisition tax)
  - Supply of low- or super-low-interest funds by the Development Bank of Japan

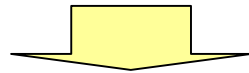
# Reception of Digital Terrestrial TV Broadcasting

## Principles

- Viewers make their own efforts to receive digital terrestrial TV broadcasting. (Purchase of digital TVs, adjustment of antennas, etc.)
- However, certain measures may be necessary if there exists significant inequality among viewers.

➤ **Raising public awareness and promoting the diffusion of digital broadcasting**

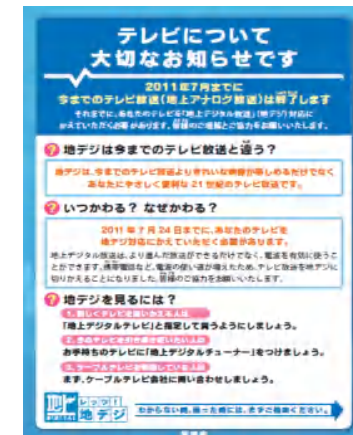
- **circulating easy-to-understand information on how to receive digital broadcasting as well as termination of analog broadcasting**
- **establishing/strengthening a scheme for consultation by viewers**



**Collaborative activity of the government, broadcasters, manufactures, and electrical appliance shops**

# Recent Efforts to Raise Public Awareness

- Revising brochures on digital broadcasting (February 2007)
- Distributing brochures aimed at the elderly (March 2007)
- Distributing brochures in foreign languages (March 2007)
- Magazine advertising (March 2007)



Brochures for the elderly

- Holding “Study Group on Consultation Scheme for Digital Terrestrial Broadcasting” (Nov.-Dec. 2006)



- Publicizing “Awareness Campaign Plan for Promotion of Digital Terrestrial Broadcasting (February 23, 2007)
- Increasing questions from viewers → Enhancing the function of the initial contact point: developing and distributing Q&As on digital terrestrial broadcasting (March 2007)
- More questions getting specific and complicated → Clarifying the role of each party: developing and distributing the list of contact points (March 2007)

地上デジタル放送 関係機関連絡先一覧	
地デジコールセンター 社団法人地上デジタル放送推進協会 / 各総合通信局	2
放送総局の役割	2
NHK 民間 / 民放各局	3-6
日本CATV機構協会	7
各ケーブルテレビ事業者	7-14
メーカー各社	15
事務局 / 事務局	15

List of contact points

# Results of Survey on Degree of Public Awareness of Digital Terrestrial Television Broadcasting

The visibility of the public on “the termination of analog terrestrial television broadcasting” is 93.9%; that on “when to terminate analog terrestrial television broadcasting” is 60.4%; the penetration rate for households of “receivers capable of receiving digital terrestrial broadcasting” is 27.8%.

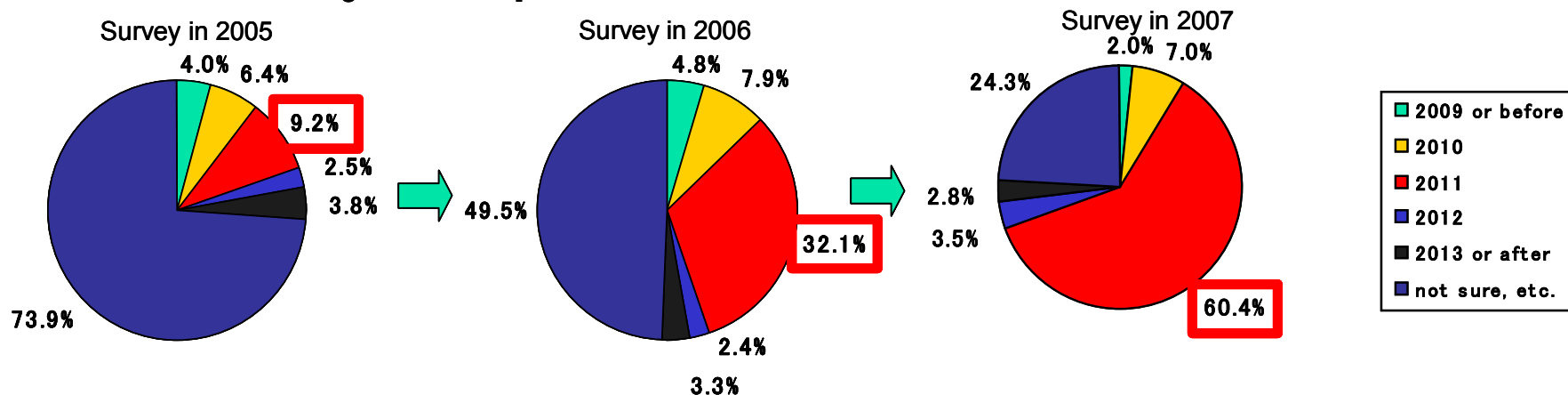
## 1. Overview of the survey

- 1) area surveyed: nationwide
- 2) people surveyed: individuals from 15 to 79 years old
- 3) number of respondents: about 7000

## 2. Items surveyed

- (1) awareness of digital terrestrial TV broadcasting in general
- (2) digital terrestrial TV watching and evaluation
- (3) awareness of the termination of analog terrestrial TV broadcasting
- (4) penetration rate of digital receivers
- (5) when to buy which receivers (TVs, tuners, etc.)

[Shift in awareness of analog termination]



# Issues Concerning Analog Termination

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## ➤ **Conditions for analog termination**

- digital coverage of analog areas
- number of non-digital-viewing households
- existence of receivers incapable of receiving digital terrestrial TV broadcasting in one household
- thorough awareness campaign and consultation

..., etc.

## ➤ **Process of termination**

- terminating nationwide at once or region by region (spatial)
- termination at same time or not (time)
- notification over TV programs

..., etc.

# Obrigado

**Thank you for your Attention!**

**Domo Arigato Gozaimashita**

**Digital Broadcasting Expert Group (DiBEG)**

In ARIB (Association of Radio Industries and Business)

<http://www.dibeg.org>