The 28th STAG Board Meeting
Session Ⅱ： Intelligent Infrastructure

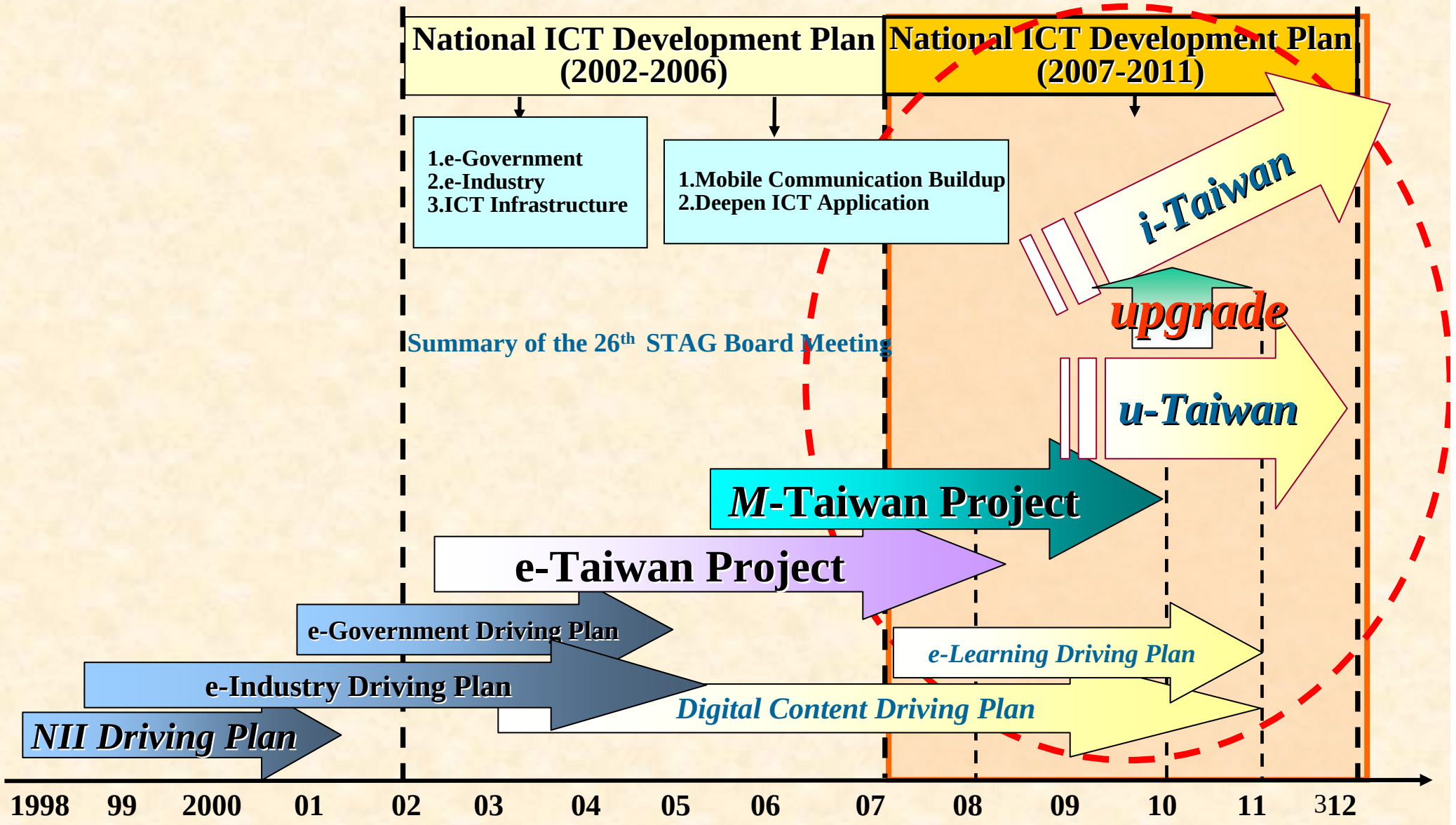
Topic Ⅲ：
Broadband Network and Digital Convergence

Ministry of Transportation and Communication

2008.11.18

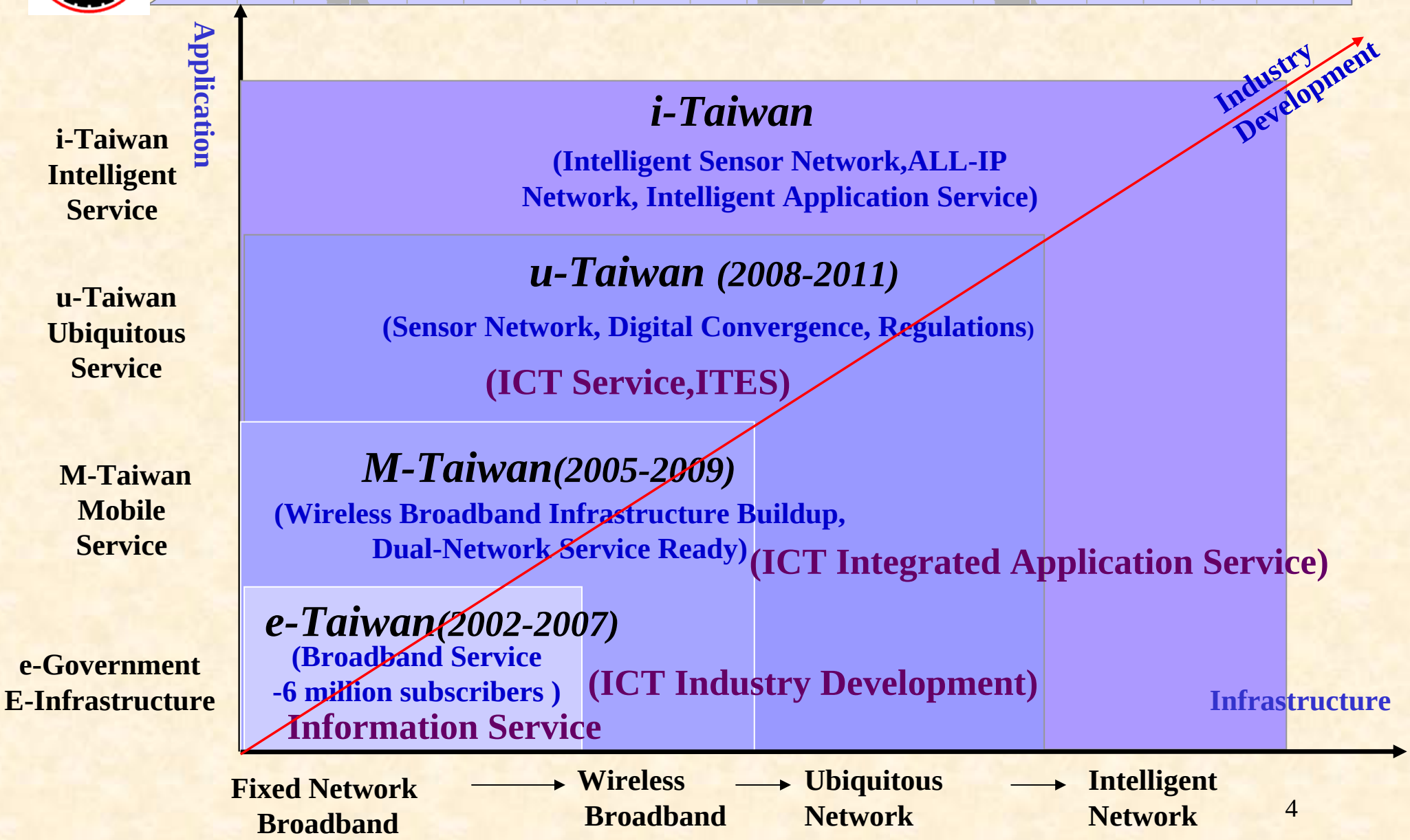
Content

Ⅰ. Preface - Milestones for ICT development in Taiwan



Information source:NICI Group, Executive Yuan, 2008/9

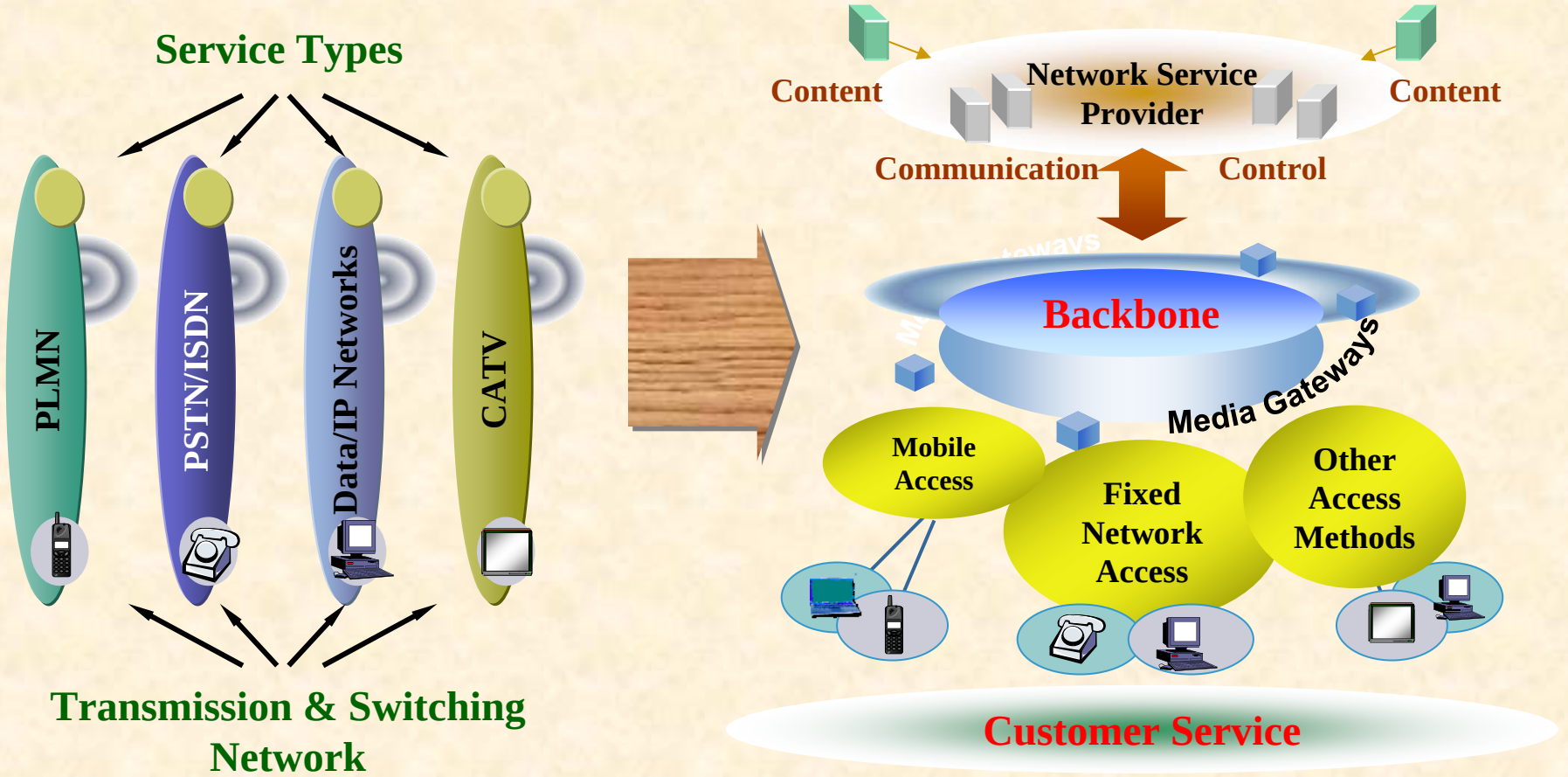
Ⅰ. Preface - ICT Policy Evolution of ROC



Ⅰ. Preface - Digital Network Convergence Diagram

Today
Single Function Service Network

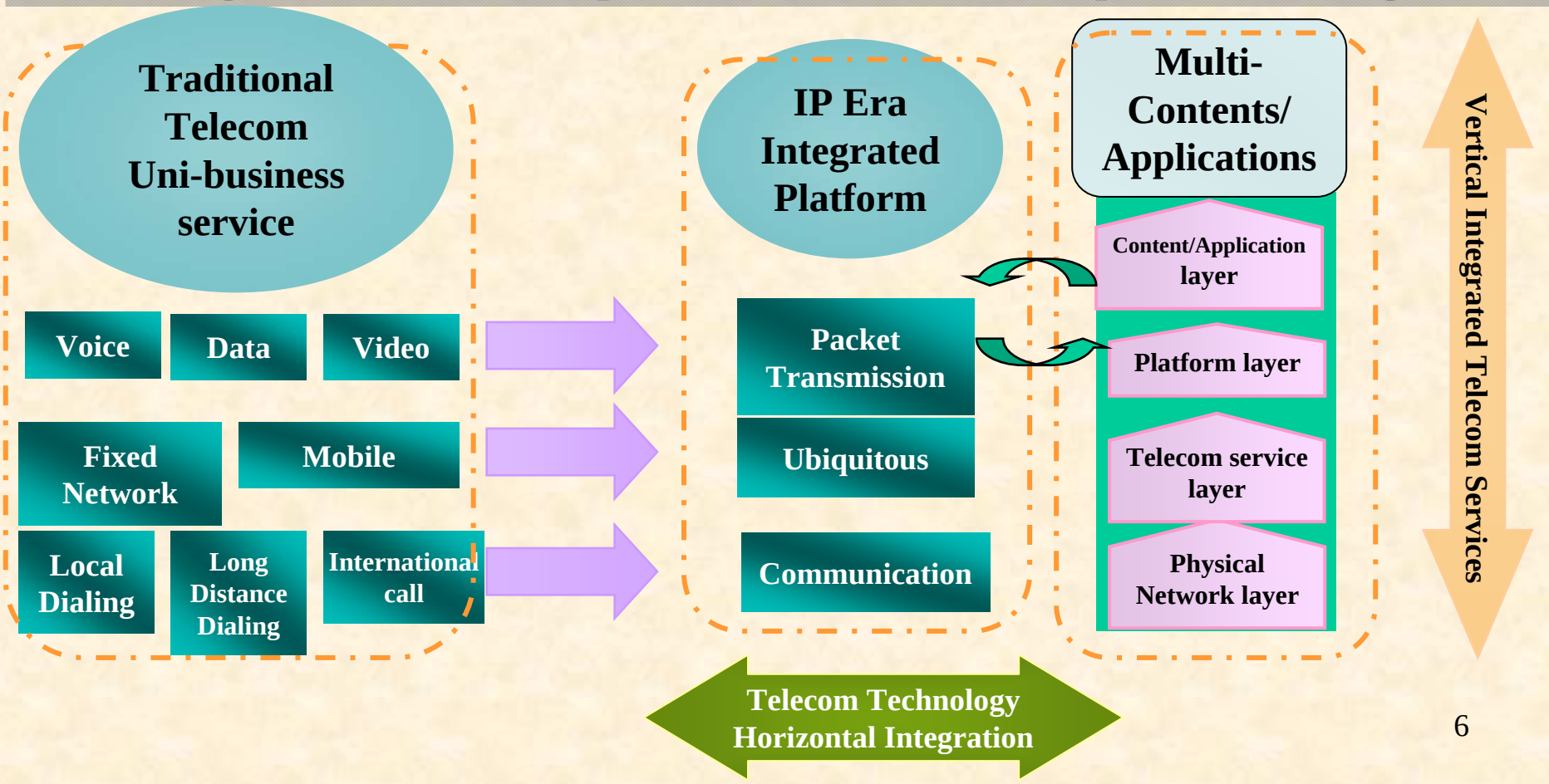
Tomorrow
Multi-service Network/Customer Service



Ⅰ. Preface - Impact of IP Network over Competition

Telecom Service Market Shift

Uni-market competition（Uni-field Competition）diminishes,
Integrated Market Competition（Cross-field Competition）emerges



Ⅱ. Current State Analysis - Development Object

Vision

To build up Taiwan as a secure, comfortable, convenient, and sustainable smart society

Purposes

- **To create an intelligent environment, develop innovative technological service, provide nationals with a peaceful, and convenient high-quality living environment.**
- **To leverage high-quality technological living environment, incubate technological service industries, strengthen international competitive edge.**
- **With speedy transition of the society, we should use the e-learning technology to develop a learning society, thus lay the foundation for social transformation.**

Objectives

- **To reach coverage of 80% for broadband network over 30Mbps, building Taiwan into a safe and convenient peaceful society through ubiquitous e-service.**

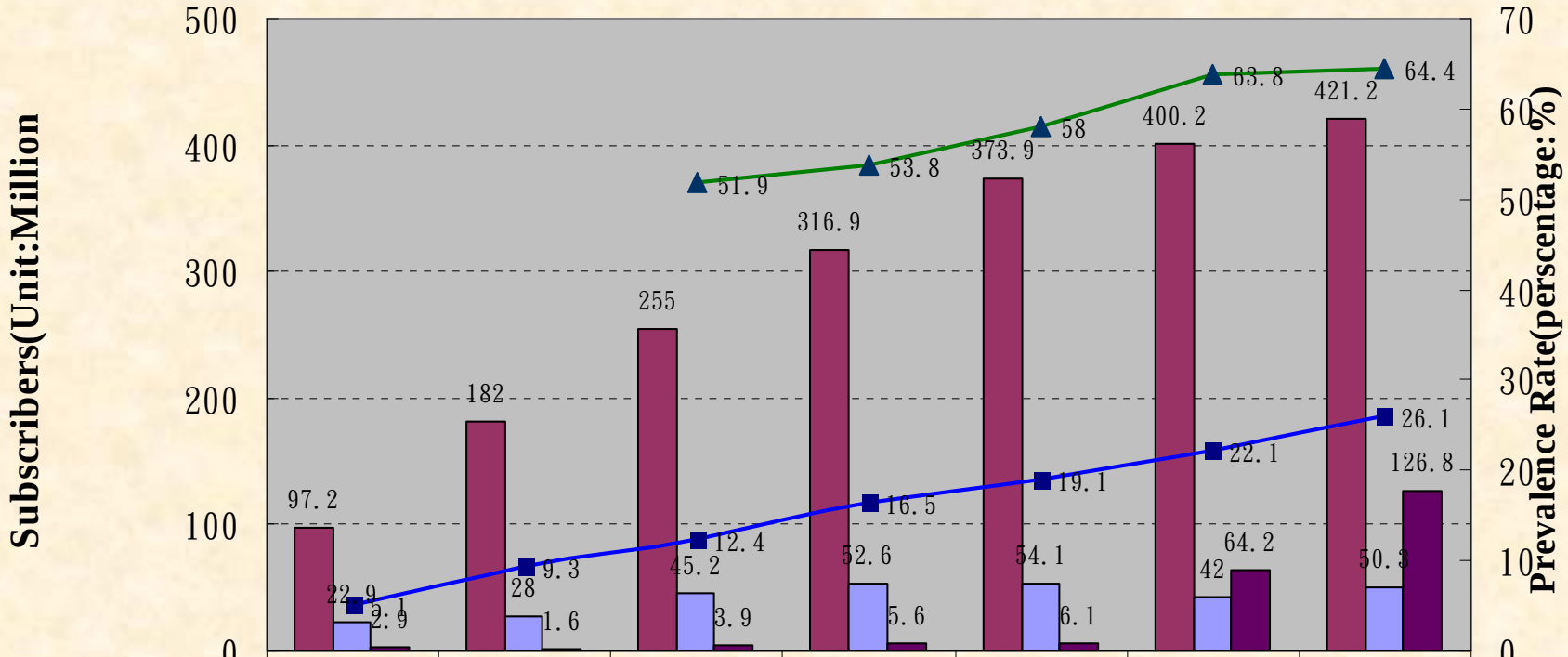
Ⅱ. Current Status Analysis - Domestic(1)

- **Mobile Phone Subscribers** 23,413 (2008/8)
  - 2G 13,671
  - 3G 9,742
- **Broadband Access Subscribers** 6,911 (2008/8)
  - Wire broadband 5,008
    - ADSL 4,371
    - Cable Modem and Leased Lines 637
  - Wireless Broadband 1,903
    - PWLAN 53
    - 3G *1 1,850
- **Broadband account prevalence rate** 30% (2008/8)
- **Internet access prevalence rate** * 64.4% (2007/12)
- **Coverage ratio of Digital TV service** ** 78.01% (2008/9)

Notes：
- unit: 1,000 households
- Broadband includes ADSL, Cable Modem, Leased Lines, PWLAN, 3G (*1:Internet access via cell phones and data cards)
- Data Source: NCC、FIND(*)、Government Information Office(**)

Ⅱ. Current Status Analysis - Domestic(2)

Telecommunications-Broadband Subscribers and Prevalence Rate



	2001	2002	2003	2004	2005	2006	2007
ADSL Subscribers	97.2	182	255	316.9	373.9	400.2	421.2
Cable modem Subscribers	22.9	28	45.2	52.6	54.1	42	50.3
others	2.9	1.6	3.9	5.6	6.1	64.2	126.8
Internet access prevalence rate			51.9	53.8	58	63.8	64.4
Broadband account prevalence rate	5.1	9.3	12.4	16.5	19.1	22.1	26.1

Annual

Ⅱ. Current Status Analysis - Domestic(3)

Background of cross-business operation of communication and broadcasting

- The extent of regulation on telecom and broadcast business impose by the Telecommunications Act and the 3 Broadcasting and Television Laws are obviously different. No telecommunications enterprise is running a cross-operation business model now. The Chung-Hwa Telecom provides MOD service with an identity of a fixed network operator, which falls into IPTV type.
- There are 61 cable TV operators in 51 operational areas nationally,mostly running circuit leasing business,one is licensed to run local network business.
- Incumbent operators are suit for digital broadcasting/ mobile data communication cross-ownership business type,none of them go into it yet.

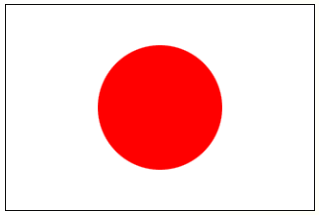
II. Current Status Analysis - International(1)

Items	Japan	South Korea	Singapore
Concept of Ubiquitous network Society	Anywhere and anytime access for anyone and anything	Anytime, any where, any device, any service, all security	A secured, high-speed and ubiquitous network
Authority	MIC Japan	MIC Korea	IDA Singapore
Strategy	u-Japan	IT839	iN2015
During	2004-2010	2004-2010	2006-2015
Vision	The world's fastest achievement of the IT revolution in FY2010	Ubiquitous network infrastructure and GDP up to $20000	an Intelligent Nation a Global City Powered by Infocomm
Main Policies	◆Ubiquitous network environment	◆8 Services ◆3 Infrastructures ◆9 New Growth Engineers	◆ Innovation ◆ Integration ◆ Internationalization

Information source: MIC Japan, MIC Korea, IDA Singapore

II. Current Status Analysis - International(2)

Japan



e-Japan(2001.1)

e-Japan II(2003.7)

u-Japan(2004.12)

Infoeconomic • Industry Vision(2005.4)

IT reform Strategy (2006.1)

The world's fastest achievement of the IT revolution in FY2010

South Korea

Cyber Korea 21(1999)

e-Korea(2002)

IT839(2004.6)

u-IT839(2006.2)

u-korea(2006.3)

No.1 Ubiquitous Society of the world

Singapore

Infocomm 21(2000)

Internet for family(2002)

Networking (2003)

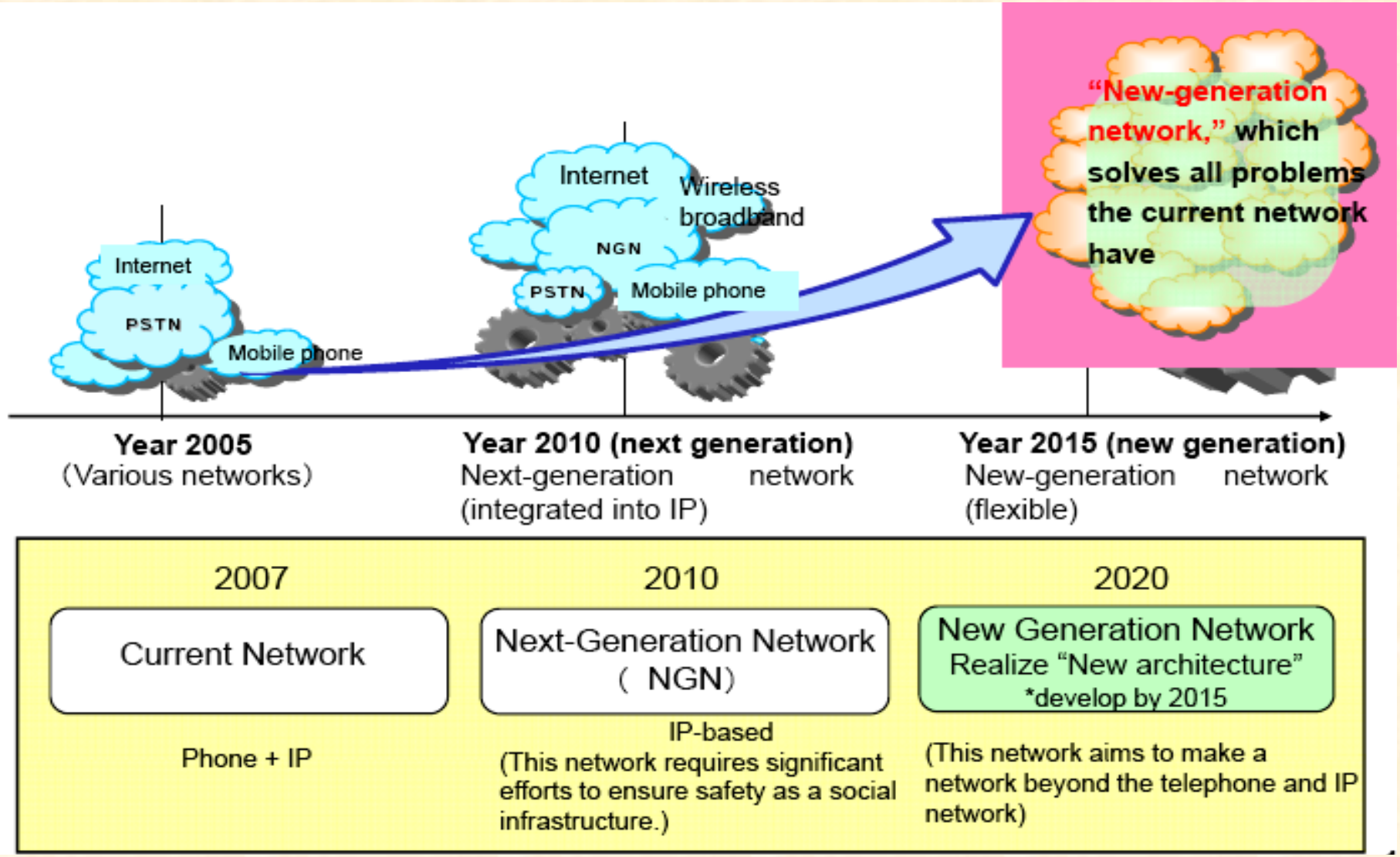
Intelligent National 2015(2005)

Intelligent Country and Global City

1999 2000 2001 2002 2003 2004 2005 2006 - - → 2010 2015

Information source: Executive Yan NICI/Institute for Information Industry ， 2006/7

II. Current Status Analysis - International(3)



Information source : MIC JP

II. Current Status Analysis - Global IT Report

❖ WEF2007-2008

- ➢ Networked Readiness Index, NRI

  17 → 15 → 7 → 13 → 17

  - ❑ Environment： 17 → 21
  - ❑ Readiness ： 7 → 9
  - ❑ Usage ： 13 → 13

❖ EIU 2008 IT：

Rank : 6 → 2 (No.1 in Asia)

❖ WSIS Report 2007

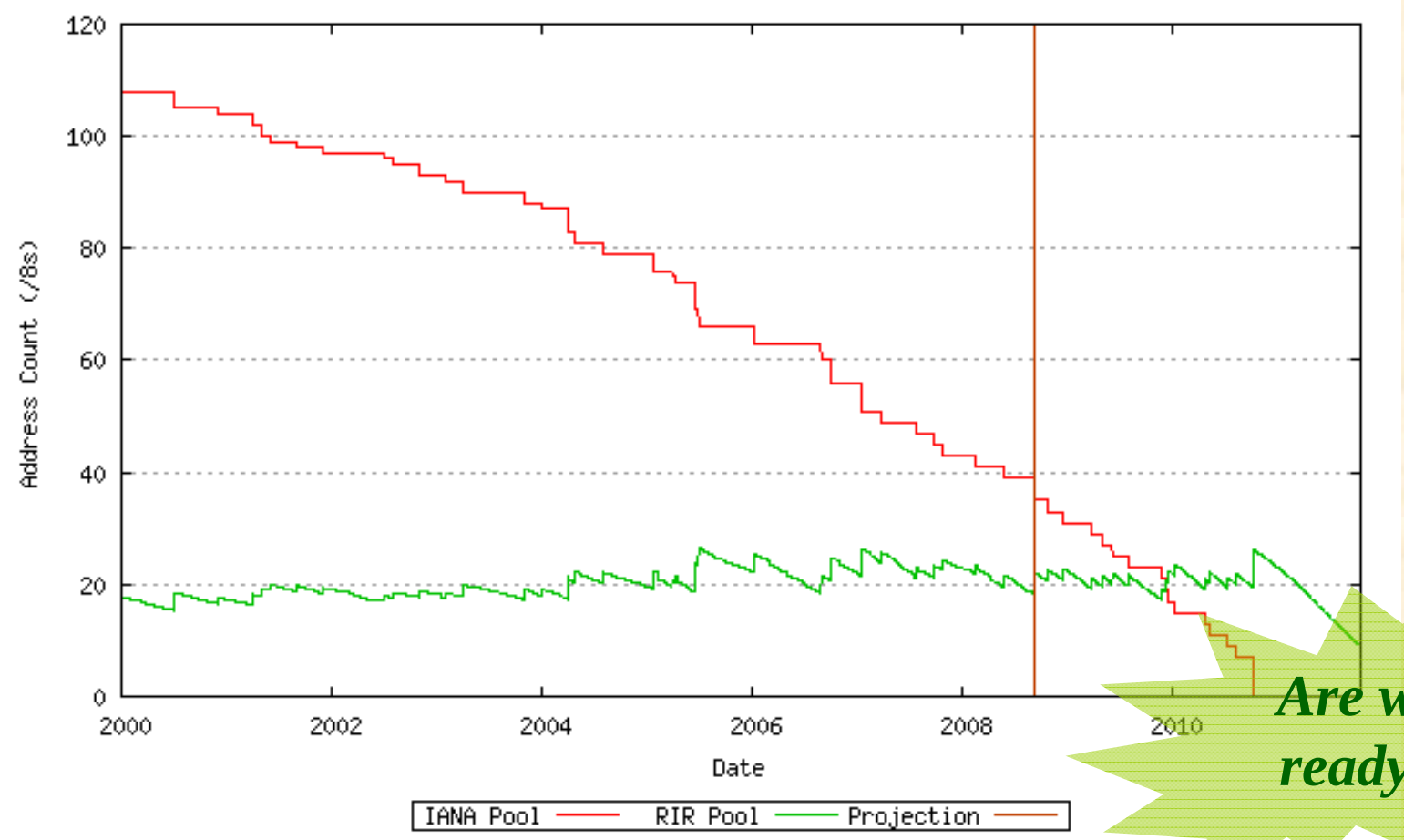
- ➢ Digital Opportunity rank： 10 → 7
  - ❑ Infrastructure ：2
  - ❑ Network Opportunity ：6

❖ FTTH Council 2008 report

Fiber Penetration：7% rank： 7 → 5

II. Current Status Analysis - IPv4 address exhaustion

- Projected **IANA** Unallocated Address Pool Exhaustion: **21-Nov-2010**
- Projected **RIR** Unallocated Address Pool Exhaustion: **16-Nov-2011**



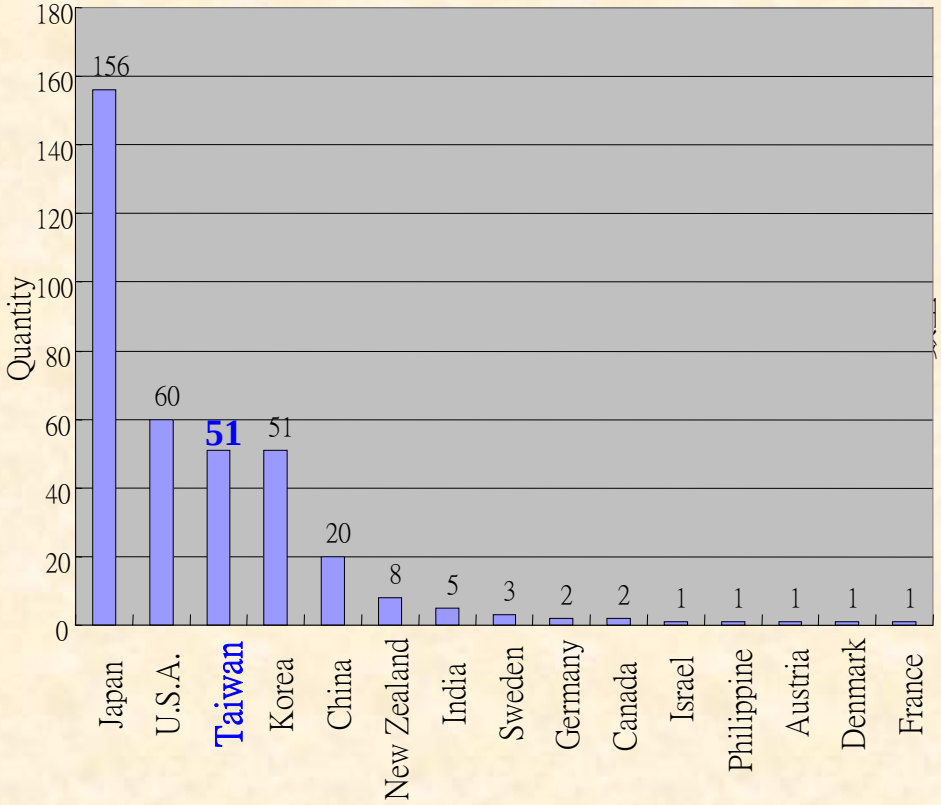
Are we ready?

Information source: http://www.potaroo.net/tools/ipv4/

II. Current Status Analysis - IPv6 Ready Logo

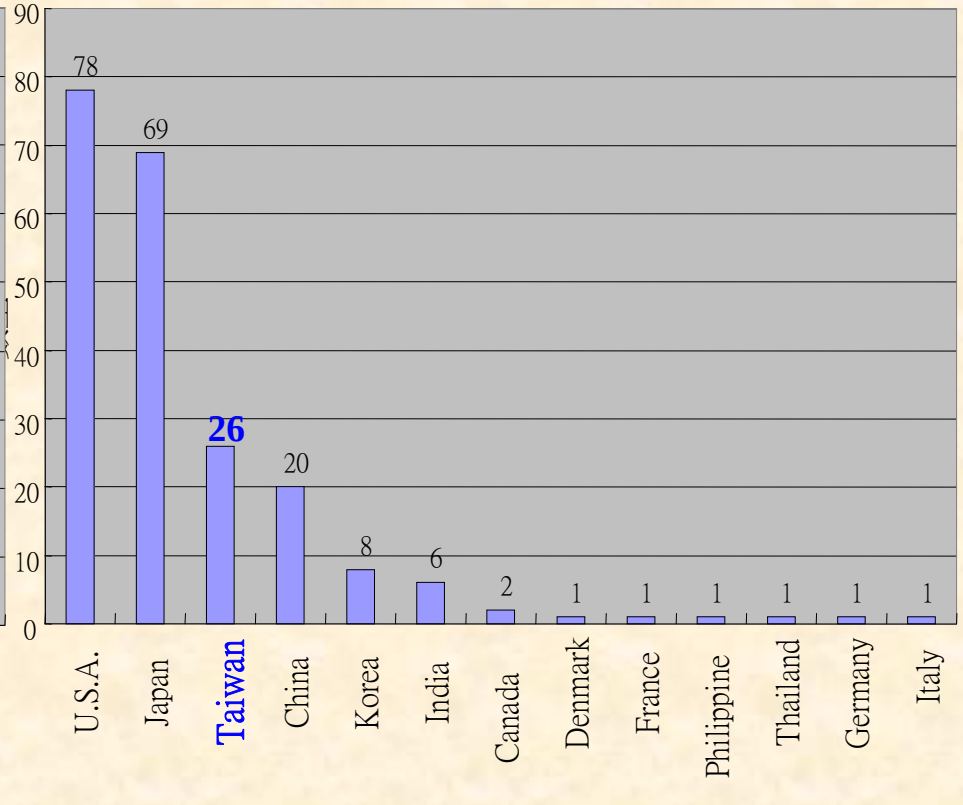
Phase 1

The Approved Application Statistic List of Global IPv6 Ready Logo Phase I (~20081027)



Phase 2

The Approved Application Statistic List of Global IPv6 Ready Logo Phase II (~20081027)



Phase-1 : 51 for TW (Oct,2008)

Phase-2 : 26 for TW (Oct,2008)

II. Current Status Analysis - International IPv6 deployment

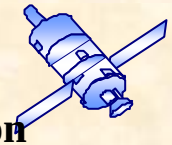
- **All U.S. Government** Core Networks are IPv6 Capable **by June 2008**
- EC encourages **ISPs** provide **full IPv6** networking **by 2010;** and enable **IPv6** function on **Public Application Websites** and **e-Government.**
- **Japan** released white paper -「Address exhaustion」in December 7,2007, and all **ISPs** deployment **IPv6 by 2010.**
- **Korea** announced promotion plan of IPv6, **70%** network IPv6-Ready and **10 billions IPv6 subscribers** by **2010.**
- **Singapore** issued **iN2015„ IPv6-Ready,** National Fiber Network speeds of more than **1 Gbps** in Singapore by **2012.**

Ⅲ. Strategies - Development Blueprint (1)

Satellite and Digital Broadcasting

Internet

Infrastructure

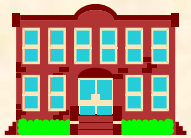


Satellite Station

Mobile Services

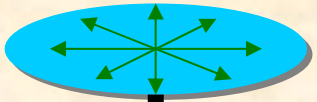
Radio Station

Data Transmission
Info-services



Content Providers

❖EPG
❖Data transmission
❖Mobile Broadcasting



connecting

Antenna

❖E-mail
❖Data-searching
❖Electronic equipments

Mobile learning

HII Unit

Digital Family

Mobile

phones

Wired network

Fiber network

Mobile life

❖Mobile phone
❖Image phone
❖Data transmission

CATV

Ⅲ. Strategies - Development Blueprint (2)

30Mbps broadband network, Intelligent Sensing Environment, Proactive Care Service

Preparing high-quality network, UNS development environment ready

Initiate critical life application

Solve livelihood necessity

- •Healthcare
- •Home Security
- •Recreation
- •Efficiency of life and work
- •Car information and secuurity

Ⅲ. Strategies： Schedule

❖ Broadband Coverage Rate Project by year

Year	2008	2009	2010	2011
Goal (%)	40	50	65	80

❖ Definition of Broadband Coverage Rate

Within the radius of 600m of the fiber/wireless dropping point, the relevant equipment should be ready. If the customer apply for use, then the number of households in service can be provided in one month / number of total domestic households

Notes：FTTx is the major broadband technology now, wireless WiMAX/ 3GPP will be applied in the future, (FTTx+PLC) and (Hybrid Fiber Coaxial,HFC) could be options, too.

Ⅲ. Strategies - Concrete Programs of Action

1. Deployment of broadband infrastructure

1.1 Promotion of mobile broadband network

1.2 Acceleration of NGN broadband deployment

1.3 Promotion of IPv6 infrastructure

2. Promotion of digital network convergence

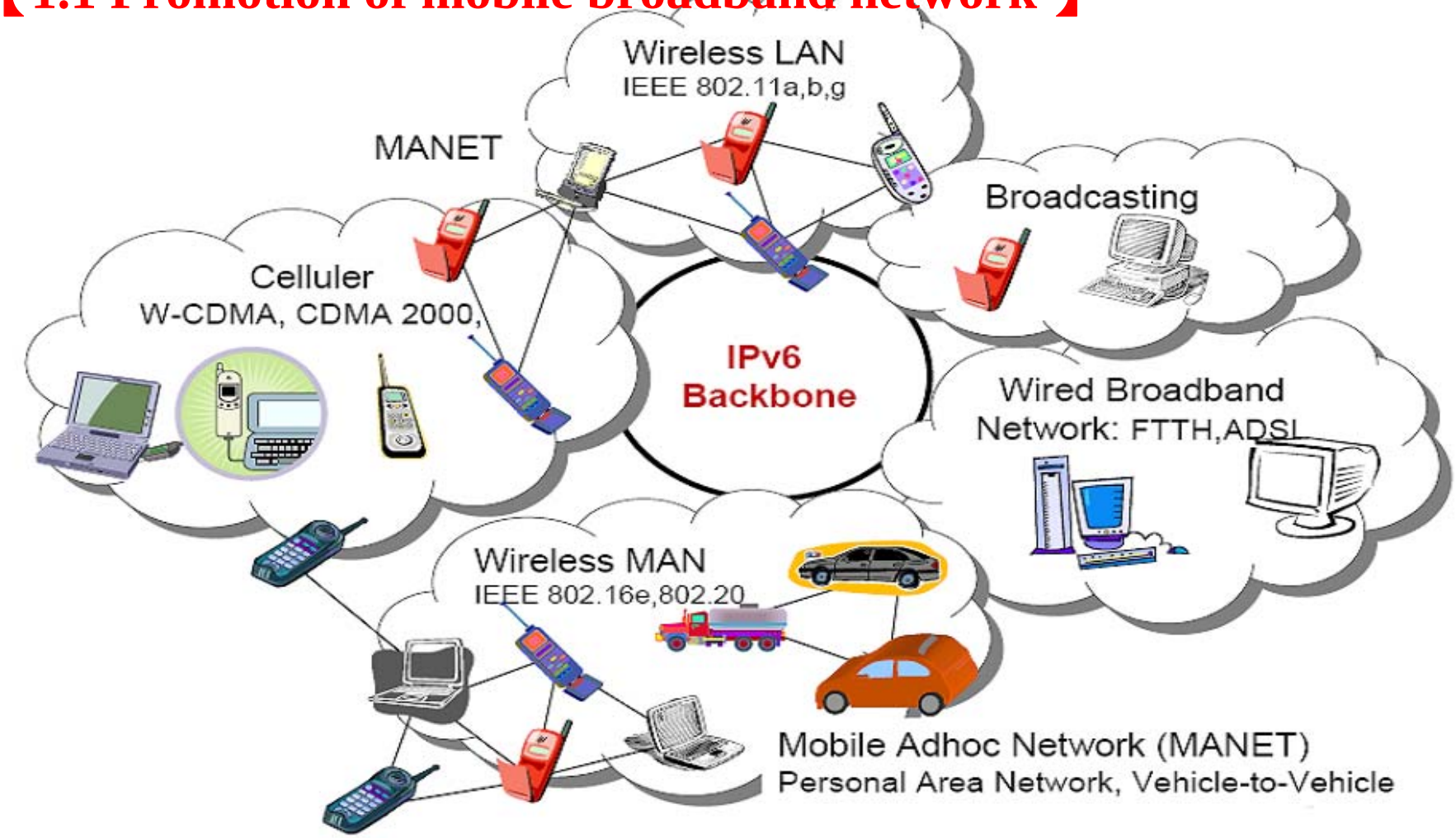
2.1 Preparation for regulations on digital convergence

2.2 Enforcement of effective use of scarce resources such as frequencies and numbers

2.3 Facilitation of convergence for ICT and broadcasting networks

Ⅲ. Strategies - Concrete Programs of Action 1.1-1

【1.1 Promotion of mobile broadband network 】



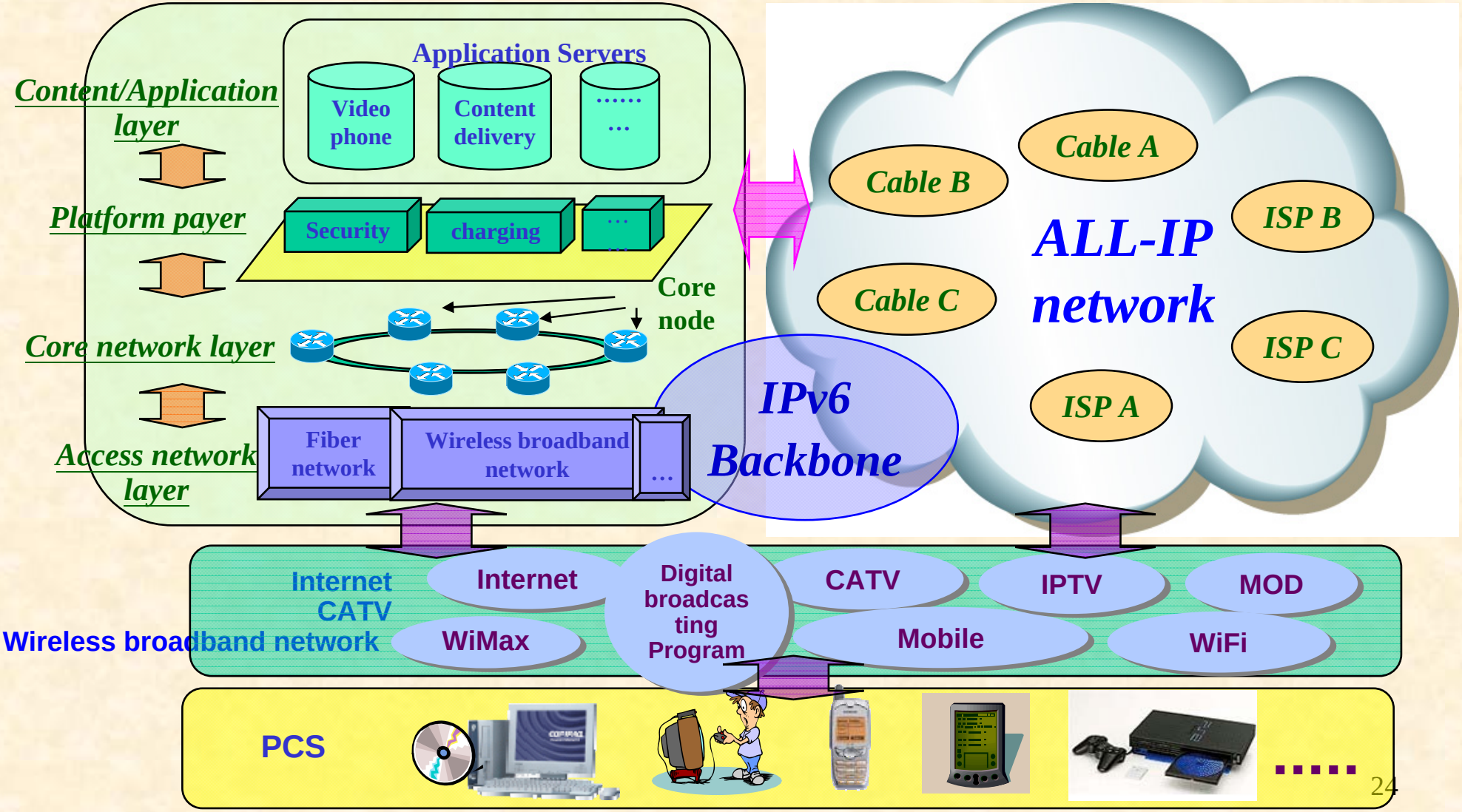
【1.1 Promotion of mobile broadband network 】

❖ Key Measures

- Develop wireless broadband network(WBA, 3GPP LTE, WLAN, HSDPA …)
- Provide FTTx+ WiMAX(or PLC) services to remote areas
- Check spectrum utility, plan usage of appropriate spectrum
- Driving wireless broadband application services of mobile life/service/learning/remoteness, promote mobile broadband network buildup

Ⅲ. Strategies - Concrete Programs of Action 1.2-1

【1.2 Acceleration of NGN broadband deployment 】



Ⅲ. Strategies - Concrete Programs of Action 1.2-2

【1.2 Acceleration of NGN broadband deployment 】

❖ **New Generation Network, NwGN**

- ALL-IP network environment
- Integrated broadband network platform
- Variety of services
- Anytime, Anywhere, Anything, Anyone

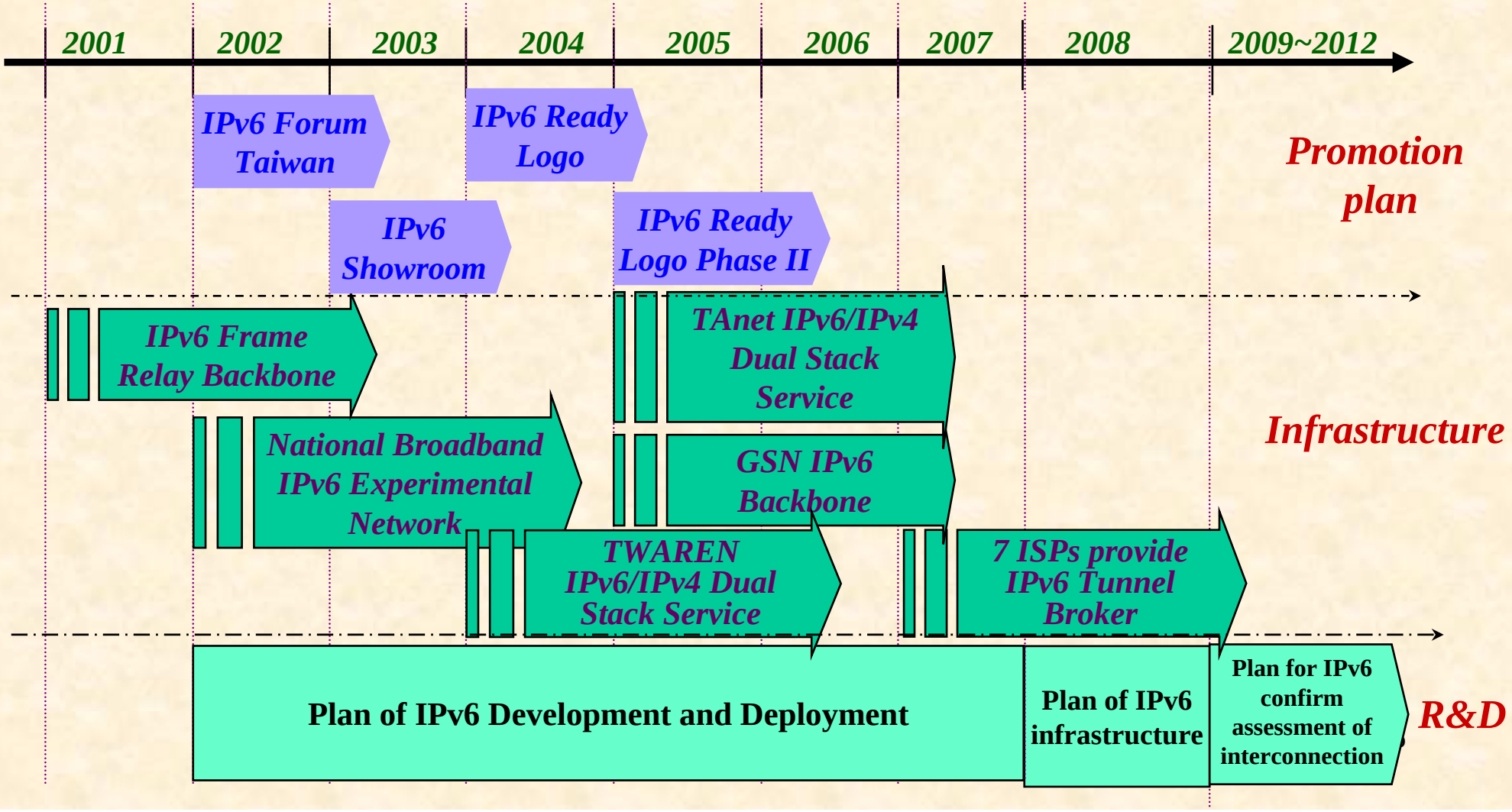
❖ **Main strategic**

- Speeding up Fixed-Mobile Convergence(FMC)
- Promoting FTTx and Wireless broadband access network
- CATV Digitalizing
- Working out the pipeline for fiber network
- GSN access fiber network
- Promoting FTTx+PLC communication application services

Ⅲ. Strategies - Concrete Programs of Action 1.3-1

【1.3 Promotion of IPv6 infrastructure 】

Roadmap of IPv6 development in Taiwan



Ⅲ. Strategies - Concrete Programs of Action 1.3-2

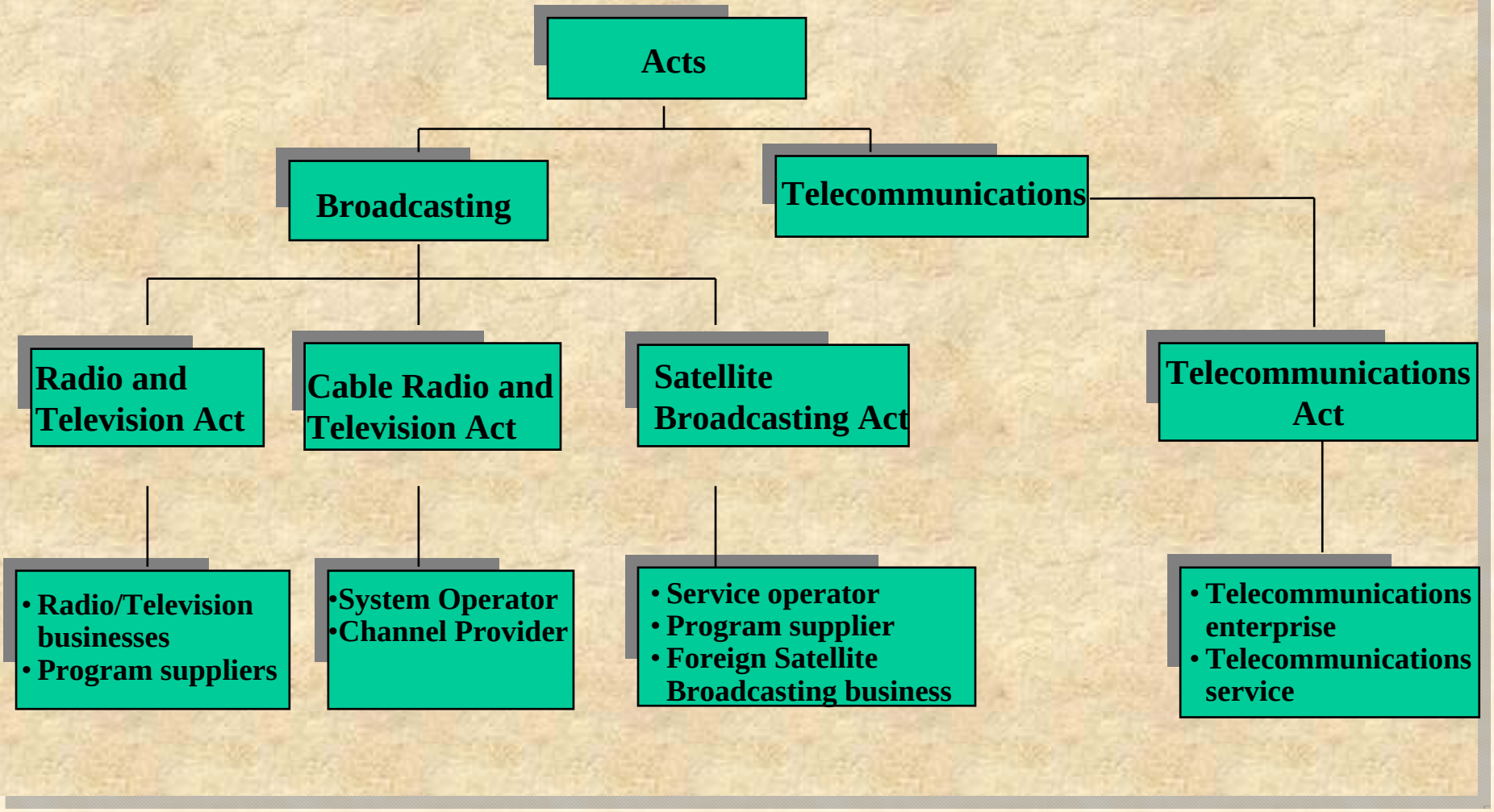
【1.3 Promotion of IPv6 infrastructure 】

The Plan for IPv6 confirm assessment of interoperability

strategy	2009	2010	2011	2012
1. Program of IPv4/IPv6 address	Research for IP address management			
		Transfer procedure of IPv4/IPv6 network		
2. IPv4/IPv6 tests of interoperating and type approval	IPv6 Ready Logo			
	IPv4/IPv6 dual stack standards, managements and interoperability testing			
	SIPv4/SIPv6 standards and interoperability testing		WiMAX/3G/FTTx IPv4/IPv6 Interoperability testing	
		IPv4/IPv6 network security and interoperability testing		
			Mobile IPv4 and IPv6 product testing	
3. IPv4/IPv6 research of interconnecting technology	IPv4/IPv6 network access trial		IPv6 confirm assessment and interoperability and performance	
	Research for IPv4/IPv6 network application interoperability		IPv4/IPv6 application services trial	

Ⅲ. Strategies - Concrete Programs of Action 2.1-1

【2.1 Preparation for regulations on digital convergence 】



【2.1 Preparation for regulations on digital convergence 】

❖ Preparation of Lawful Environment of Digital Convergence

- Overseeing regulation evolution—To edit communication and broadcasting action law
- Promote Digital Convergence
- Establish new regulation model of digital convergence

❖ Build Fair Competition Environment

- Promote Competiton
- Establish fair competition mechanism

❖ Promote Industrial Development

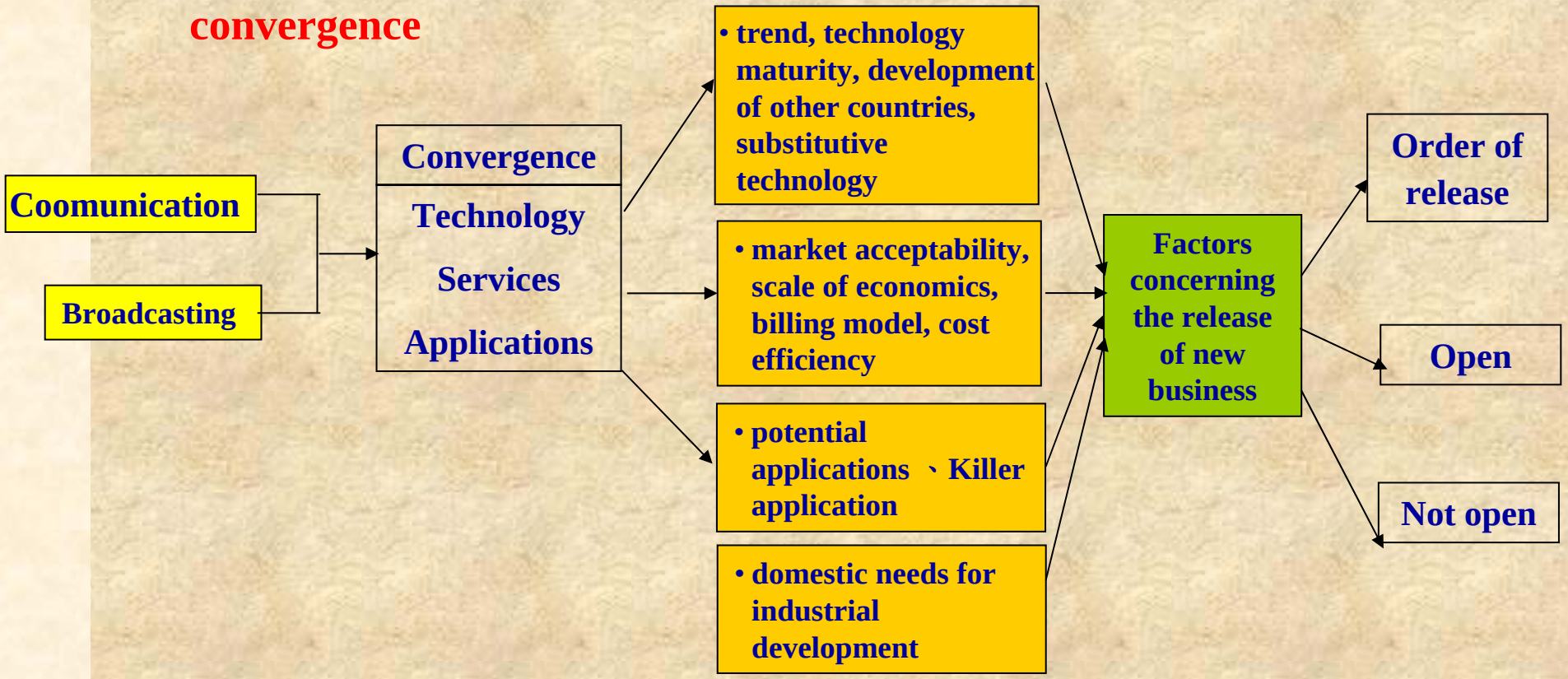
Ⅲ. Strategies - Concrete Programs of Action 2.1-2

【2.1 Preparation for regulations on digital convergence 】-- Factors concerning the release of new business under the trend of digital convergence

- In facing the new wave of communication/broadcasting convergence, government should decide the path of the industry and timely provide technical, service or application main/key options to drive the development of Taiwan's integrated digital economics.
- The decision of key element and blueprint of Taiwan's future technologies, services and applications depend on trend, technology maturity, development of other countries, substitutive technology, market acceptability, scale of economics, billing model, cost efficiency, potential applications and domestic needs for industrial development. After carefully inspection of above factors, then the time and order of new business release can be decided.
- For example, the factors concerning the release of Mobile TV could be as follows:
  - Mobile TV is only a kind of IPTV. There may be another substitutive service with different technology in the market.
  - Can its services attract consumers? Is the billing model workable?
  - What are its potentials? Any possibility of a killer application to drive the development?
  - Training field is needed for domestic industry.

【2.1 Preparation for regulations on digital convergence 】--

Factors concerning the release of new business under the trend of digital convergence



【2.2 Enforcement of effective use of frequencies and numbers 】

❖ Mid-to-Long term radio spectrum optimization plan of ROC

- Collecting the demand quantity/timing of various commercial frequency band, developing the release plan and impact assessment based upon new wireless technologies and their development timetable
- Planning the reuse of the recycled wireless radio frequency,so that the radio frequency spectrum to achieve the most efficient use of goal.
- Aligning frequency reuse strategy with that of ITU to achieve concordance；focusing on the spectrum utilization of both industry and government, providing demand report and analysis with respect to the supply side, establishing communication mechanism

Ⅲ. Strategies - Concrete Programs of Action 2.2-2

【2.2 Enforcement of effective use of frequencies and numbers 】

Mid-to-Long term radio spectrum optimization plan of ROC

Items	2009	2010	2011
1. Analysis of frequency utilization of ROC	Analysis of spectrum efficiency, license expiration and current situation		
	Study on international frequency interfernce		
		Study on mechanism of frequency reuse and recycle	
2. Analysis and Plan of future demand of spectrum	Spectrum allocation and prediction analysis of international organizations and major countries		
	Research on new communication/broadcast technologies (eg. Short-range communication technology plan	Spectrum demand research on new communication/broadcast technologies (B3G/4G)	
	2500-2690 MHz spectrum allocation plan	3400-3700 Mhzsatellite/fixed communication spectrum allocation	
	Research on spectrum sharing mechanism(Cognitive Radio)		
	700 MHz spectrum application and allocation	3G TDD frequency utilization analysis and plan	
	800 MHz spectrum application and allocation		
	GSM 900/1800 license and spectrum plan after 1900 MHz low power wireless radio license expires	Research on spectrum release, re-trade,price evaluation	
3. Industry and government spectrum demand scheme	Research on spectrum demand technical standards and holding technical seminars		

【2.2 Enforcement of effective use of frequencies and numbers 】

❖ General telecommunication coding scheme

- Researching on status-quo and trend of coding as well as its effect onto telecom industry , service segment and consumers
- Initiating analysis of the possibility of code-upgrade to counter the trend of network convergence and service convergence
- Achieving user-convenience, single-port, single-bill, seamless-accessible innovation service and the demand that satisfies future coding evolution
- Advancing the development of digital convergence technology such as NGN, 4G and digital convergence service as well as the coding of original fixed-network , mobile, VOIP and number management, hence to gearing up development of domestic telecom/broadcast industry and service
- Building up a fair and effective competitive environment, introducing burgeoning services to provide convenient and friendly digital convergent environment and protect the consumers' right

Ⅲ. Strategies - Concrete Programs of Action 2.2-4

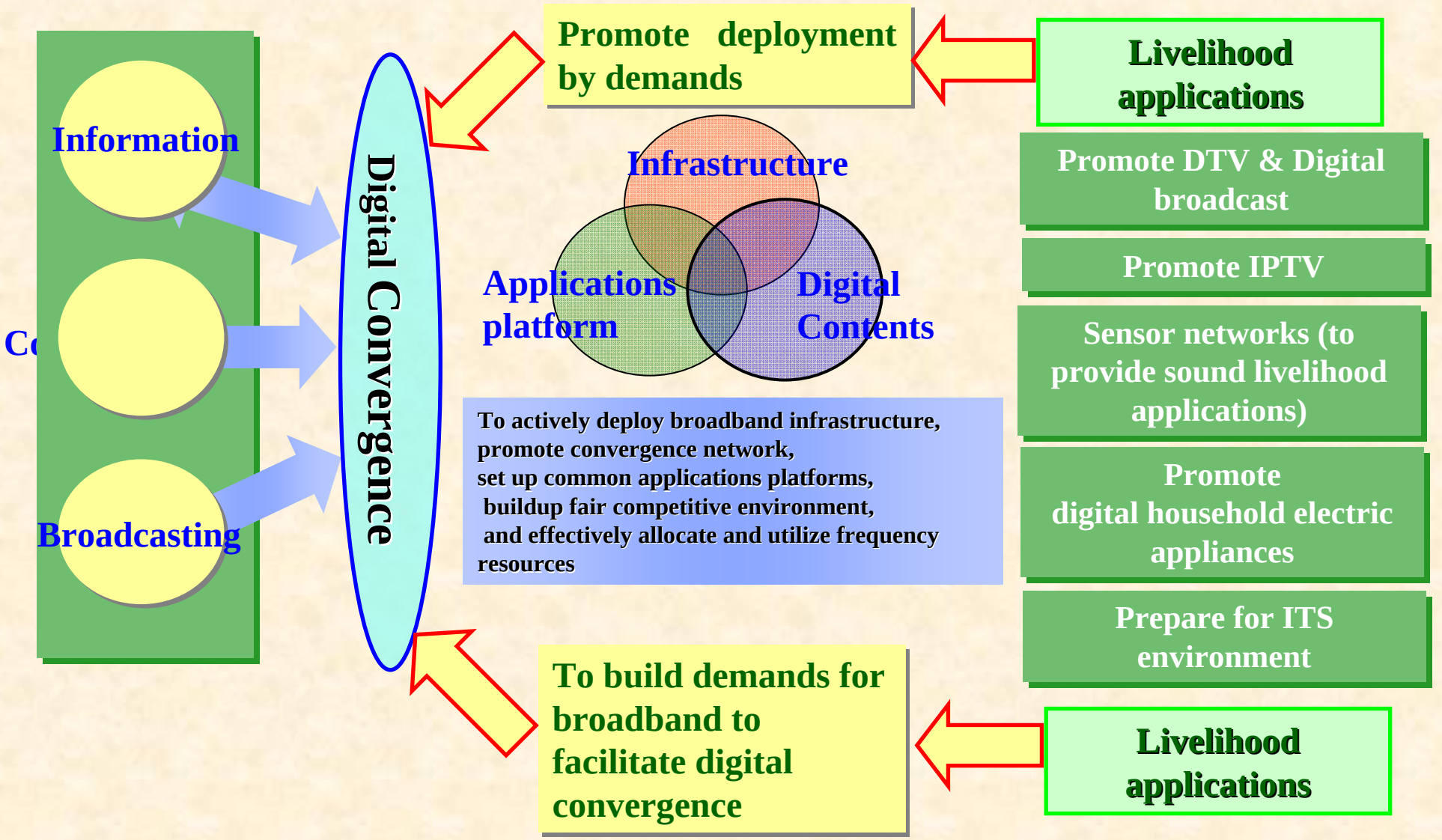
【2.2 Enforcement of effective use of frequencies and numbers 】

❖General telecommunication coding scheme

Items	2009	2010	2011
1.Research on the trend of coding scheme	Coding schemes of Europe, US ,Asia and ROC		
	Case analysis	Research on the trend of coding plan of Europe,US ,Asia and ROC	
		Research on telecom coding and service evolution of both network/service convergence	
2.Effect and plan of coding	Research on the effect of domestic coding scheme onto telecom/service industries and cosumers		
		Domestic coding scheme of network/service convergence	
3.research on number evolution and number-upgrade	Research on the number evolution and its effect		
	Research on number-upgrading and its effect		
		Effect analysis of new technologies toward number management	
		Responsive act of number management due to external conditions	
		Raising workable plans of business number-upgrading	

Ⅲ. Strategies - Concrete Programs of Action 2.3-1

【2.3 Facilitation of convergence for ICT and broadcasting networks 】



Ⅲ. Strategies - Concrete Programs of Action 2.3-2

【2.3 Facilitation of convergence for ICT and broadcasting networks 】

❖ **To conform to the development of ICT and Ubiquitous Network Society, the following programs of action should be actively implemented to integrate ICT and broadcasting networks, so as to create demands from industries, to effectively grasp the trends of convergence, and to accelerate industrial and national competitiveness:**

- **To promote the digitization of CATV, wireless TV and broadcast**
- **To promote ALL-IP network environment**
- **To deploy wireless sensor network**
- **To promote IPTV convergence service**
- **To promote digitization of household electric appliances**
- **To prepare for ITS environment**

Ⅲ. Strategies - Development Strategies and Action Plans

Strategy Items	Action Plan	Administrator
Promotion of mobile broadband network	• Provide FTTx+ WiMAX services to remote areas • Check spectrum utility, plan usage of appropriate spectrum	MOTC, (MOEA, NCC)
Acceleration of NGN broadband deployment	• Promoting FTTx broadband access network • Promoting FTTx+PLC communication application services	MOTC, (MOEA)
Promotion of IPv6 infrastructure	• The Plan for IPv6 confirm assessment of interoperability	MOTC
Preparation for regulations on digital convergence	• To edit communication and broadcasting action law	NCC, (MOTC, GIO)
Enforcement of effective use of scarce resources such as frequencies and numbers	• Mid-to-Long term radio spectrum optimization plan of ROC • General telecommunication coding scheme	MOTC
Facilitation of convergence for ICT and broadcasting networks	• To promote the digitization of CATV, wireless TV and broadcast • To promote ALL-IP network environment • To prepare for ITS environment	MOTC, (NCC, GIO, MOEA)

Ⅳ. Conclusion

- **3 decisive factors for digital convergence：**
  - **Technology—to deploy network infrastructure, technology development is the driving force for convergence**
  - **Market—to develop integrated and high-quality application services to facilitate convergence**
  - **Legal system—to utilize policies and regulations to set up a fair competition environment to facilitate industry development, to enhance consumers' welfare, and to accelerate national competitiveness.**
- **Currently ICT and broadcasting technologies for convergence have been in place. However, obstacles still exist in the cross-business operation of telecommunication and broadcasting industry. As for setting up of a fair competition environment for market development in the future, preparedness of regulations will be a key point for promotion.**
- **To facilitate NGN deployment, at present focal points and directions for our ICT development are as follows:**
  - **To promote the digitization of TV and broadcast, ALL-IP network environment**
  - **To facilitate deployment of FTTx and WBA network**
  - **To promote the prevalence of broadband network services**

V. Topics for Discussion (1)

❖ Promotion of FTTx

- By the end of 2007,notable lag of FTTx prevalence rate exists between ROC and world top 3 countries-South Korea,Hong Kong and Japan,thus expediting FTTx infrastructure is one of ROC's ICT developmental priorities.
- For efficient promotion of FTTx development, is there any plan of assistant and incentive measures with respect to regulations and taxes? How can we do to exclude barriers for construction?

V. Topics for Discussion (2)

❖ Promotion of IPv6

- Plan for IPv4/IPv6 Interoperability Verification will start from 2009 to 2012 after Plan of IPv6 Development and Deployment(2003-2007) and Plan for Universal Device Networking Infrastructure(2008) , Priorities includes policy making of IPv4/IPv6 Internet protocol addressing, IPv4/IPv6 interoperability technologies and test of IPv4/IPv6 interoperability and equipment.
- For smooth and seamless transfer, how do countries in the world do to align IPv6 with international technology, and to set up a thorough mechanism and procedures for such transfer?

V. Topics for Discussion (3)

❖ Efficient use of frequency resources..

- In the future, frequency for analog wireless TV will be recalled for reuse. The recalled frequency band are 608-704 MHz, i.e., 100 MHz in total. What is the mainstream technologies for use of such frequency band and direction for development? Which emerging technologies and industries are more suitable to use such frequency band? Is there any suggestion for future release of frequency?

V. Topics for Discussion (4)

❖ Fair competition of communication/broadcasting convergence

- Current status of digitization：
  - Telecom operators have achieved digitization.
  - 52% of cable TV operators can broadcast via digital/analog channels, about 4% of households receive via digital channels.
  - Coverage ratio of digital wireless TV is roughly 78%, digital TV receiver has not been popularized.
  - The audio broadcasting operators have not achieved digitization.
- Should both communication/broadcasting operators stand on the same base-digitization to realize fair competition of communication/broadcasting convergence?
- Strategy for digitization? Regulation enforcement? subsidy?


The End
Thank you very much